Economic Impact Assessment and Legal Review and Analysis of the East African Community Seed and Fertilizer Legislation

COMPARATIVE ASSESSMENT SUBMITTED TO EMERGE CENTRE FOR INNOVATIONS-AFRICA FOR THE EAST AFRICAN COMMUNITY SECRETARIAT UNDER THE *PARTNERSHIP TOWARD CATALYZING THE IMPLEMENTATION OF CAADP-MALABO 2017-2020*, SUPPORTED BY THE ALLIANCE FOR A GREEN REVOLUTION IN AFRICA

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Contents

Acronyms and Abbreviations

ACTESA	Alliance for Commodity Trade in Eastern and Southern Africa
AFAP	African Fertilizer and Agribusiness Partnership
AfCFTA	African Continental Free Trade Agreement
AGRA	Alliance for a Green Revolution in Africa
AOSA	Association of Official Seed Analysts
ARIPO	African Regional Intellectual Property Organization
ASA	Tanzania's Agricultural Seed Agency
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
AU	African Union
CAADP	Comprehensive Africa Agriculture Development Programme
COMESA	Common Market for Eastern and Southern Africa
COMESA Seed Trade Regulations	COMESA Seed Trade Harmonization Regulations, 2014
COMRAP	COMESA Regional Agro-Inputs Programme
COMSHIP	COMESA Seed Harmonization Implementation Plan
CORAF	West and Central African Council for Agricultural Research
CORAF/WECARD	Conference of the African and French Leaders of Agricultural Research Institutes
DUS	Distinctness, Uniformity, Stability
EAC	East African Community
EAC Seed Bill	The East African Community Seed and Plant Varieties Bill
ECAPAPA	Eastern and Central Africa Programme for Agricultural Policy
ECI-Africa	Emerge Centre for Innovations-Africa
ECOSOM	Eastern Africa Seed Committee
ECOWAS	Economic Community of West African States
ECOWAS 2008 Seed Regulations	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

ECOWAS 2012 Fertilizer Regulations	ECOWAS Regulation C/Reg.13/12/12 Relating to Fertilizer Quality Control in the Ecowas Region
FAO	Food and Agriculture Organization of the United Nations
FOB	Free on Board
FOMI	''Fertilisant Organo-Mineral''
GAMS	General Algebraic Modeling Systems
IPPC	International Plant Protection Convention
ISABU	Institut des Sciences Agronomiques du Burundi
ISTA	International Seed Testing Association
KALRO	Kenya Agriculture and Livestock Research Organization
KEBS	Kenya Bureau of Standards
KEPHIS	Kenya Plant Health Inspectorate Service
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MAFS	South Sudan's Ministry of Agriculture and Food Security
MAFSC	Ministry of Agriculture, Food Security and Cooperatives
MAAIF	Uganda's Ministry of Agriculture, Animal Industry and Fisheries
NAPB	Kenya's National Association of Plant Breeders
NARO	Uganda's National Research Organization
NML	New Markets Lab
NPPOs	National Plant Protection Offices
NPT	National Performance Trials
NPTC	National Performance Trials Committee
NPT-TC	National Performance Trial Technical Committee
NSA	National Seed Authorities
NSCS	Uganda's National Seed Certification Services
NVRC	National Variety Release Committee
OECD	Organization for Economic Co-operation and Development
ONCCS	Burundi's National Seed Control and Certification Office
OSBP	One Stop Border Post
PBRs	Plant Breeders' Rights
PVoC	Pre-Export Verification of Conformity
PVP	Plant Variety Protection
QDS	Quality Declared Seed

RAB	Rwanda Agriculture and Animal Resources Development Board
RALIS	Rwanda Agriculture and Livestock Inspection and Certification Services
RECs	Regional Economic Communities
RICA	Rwanda Inspectorate, Competition and Consumer Protection Authority
RWF	Rwandan Francs
SADC	Southern African Development Community
SADC HSRS	SADC Harmonised Seed Regulatory System
SADC Seed MOU	Memorandum of Understanding on the Harmonization of Seed Regulations in the Southern African Development Community
SEM	Spatial Equilibrium Model
SPS	Sanitary and Phytosanitary
TASAI	The African Seed Index Access
TASTA	Tanzanian Seed Trade Association
TBS	Tanzania Bureau of Standards
TFRA	Tanzania Fertilizer Regulatory Authority
TFRA	Tanzania Fertilizer Regulatory Authority
TOSCI	Tanzania Official Seed Certification Institute
UNBS	Uganda National Bureau of Standards
UPHIA	Uganda Plant Health and Inspectorate Agency
UPOV	Union for the Protection of New Plant Varieties
UPOV 1991 Convention	International Convention for the Protection of New Varieties of Plants of December 2, 1961, as Revised at Geneva on November 10, 1972, on October 23, 1978, and on March 19, 1991
USAID	U.S. Agency for International Development
VCU	Value for Cultivation and Use
WACPSV	West African Catalogue of Plant Species and Varieties
WASP	West African Seed Program
WTO SPS Agreement	World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures

Executive Summary

This assessment was developed through a partnership between the East African Community (EAC) Secretariat, via the Emerge Centre for Innovations-Africa (ECI-Africa), and the New Markets Lab (NML),[1] a center for law and development which has worked extensively on the regulation of agricultural inputs, in support of the EAC's efforts to harmonize seed and fertilizer regulation. It is part of a larger three-year project between the EAC and the Alliance for a Green Revolution in Africa (AGRA), the *Partnership Toward Catalyzing the Implementation of CAADP-Malabo 2017-2020*.

Regional harmonization of laws and regulations in agricultural inputs like seed and fertilizer is critical for unleashing the potential for growth in sub-Saharan Africa's agricultural sector. Following regional harmonization of seed regulation in the Common Market for Eastern and Southern Africa (COMESA), the Southern African Development Community (SADC), and the Economic Community of West African States (ECOWAS), the EAC is now in the process of adopting a harmonized EAC Seed and Plant Varieties Bill (EAC Seed Bill), which will advance broader harmonization efforts. Furthermore, the EAC is a pioneer in Easter and Southern Africa in drafting and adopting a harmonized framework for fertilizer, something that only ECOWAS has done to date.

While regional harmonization brings a number of benefits, which are elaborated in Section I, it can also be challenging. First, at the national level, countries within a regional bloc are often at different stages of developing legal and regulatory systems in seed and fertilizer. This is true in the EAC and will affect implementation once the EAC Seed Bill and the EAC Fertilizer Bill are adopted. Furthermore, countries tend to be at different levels of economic and agricultural development overall, which creates differences in the level of investment and cost that will be necessary to comply with the new regional rules. At the regional level, most countries in Eastern and Southern Africa, including the six EAC Partner States, are members of more than one Regional Economic Community (REC), which means that obligations, standards, and rules may differ. Understanding these differences is important for national governments and has broader implications for regional harmonization, including those that will arise as the recent African Continental Free Trade Agreement (AfCFTA) moves forward.

This assessment responds to these opportunities and challenges and is divided into several sections that correspond to different aspects of regional harmonization of seed and fertilizer rules. It was develop based on extensive research, data collection (although data limitations did arise), and field consultations in each of the EAC Partner States (Burundi, Kenya, Rwanda,

[1] More information on New Markets Lab can be found at https://www.newmarketslab.org/. NML offers comparative expertise developed through previous work, international programs and case-studies, and experience with international good regulatory practices, and NML's team includes lawyers from different jurisdictions, including the EAC.

Tanzania, South Sudan, and Uganda). Following an introduction with relevant background information, the assessment benchmarks the current status of legal and regulatory frameworks for seed and fertilizer within the six EAC Partner States against the requirements set forth by the EAC Seed Bill and the EAC Fertilizer Bill. It also assesses the costs and benefits of regional seed and fertilizer harmonization for each EAC Partner State, followed by application of an economic model to further anticipate potential gains for the region from harmonization of seed in particular. Table 1 below summarizes the main findings and challenges for each of the EAC Partner States.

Importantly, the assessment incorporates stakeholders' views that highlight practical implementation challenges that currently exist and will become more pressing as regional rules are applied in practice. For instance, stakeholders have expressed concerns with the effect that regional harmonization will have on revenues and jobs. The economic analysis performed under this project shows that harmonization will have mainly positive but also some negative effects in this regard, although overall the region stands to gain from the harmonization process. Furthermore, particularly for the seed harmonization process, many of the requirements in the EAC Seed Bill are already in place for most of the Partner States, such as a national seed authority (NSA) that oversees and supervises the seed industry; regulatory processes for variety release and registration; and quality control mechanisms like seed certification. Nevertheless, some countries will face challenges when standardizing these processes and complying with some of the international standards referenced in the EAC Seed Bill, such as International Seed Testing Association (ISTA) standards and the Organization for Economic Co-operation and Development (OECD) Seed Schemes. EAC Partner States will also need to establish and update pest lists in order to comply with the EAC Seed Bill, which will come at a cost for governments.

Sections II and III focus on good regulatory practices for seed and fertilizer, respectively, given that the EAC rules will apply within a larger context. The EAC Seed Bill already incorporates a number of good practices, and the draft EAC Fertilizer Bill has also been developed based on good practices and EAC Partner Country priorities. Within the EAC, Burundi, Kenya, Rwanda, and Uganda are all also Member States of COMESA, which has advanced regional rules on seed. COMESA is also considering regional fertilizer regulation but does not yet have a system in place. Tanzania is a member of SADC, which also has a well-developed regional system for seed. South Sudan, on the other hand, is not yet a member of another REC, but has expressed interest in becoming a member of COMESA. The comparative assessment also includes ECOWAS, both as an additional benchmark and because all of the Regional Economic Communities (RECs) will harmonize as the AfCFTA moves forward.

Because of these overlapping regional rules, countries will have to watch for alignment between implementation of the obligations in the EAC Seed Bill and existing rules on seed harmonization in COMESA and SADC. With this in mind, Section II of this report provides a comparative assessment of the different regional regulatory systems for seed. ECOWAS is also included as a benchmark, as are good international practices. Similarly, Section III

benchmarks the EAC Fertilizer Bill and Policy, under development through this project, with existing regional fertilizer rules under the ECOWAS 2012 Fertilizer Regulation, which is the only other regional regulation in the continent for fertilizer, as well to international good practices. As is the case for seed, regional rules on fertilizer include a dedicated national regulatory agency for fertilizer and streamlined quality control mechanisms and cross-border trade procedures.

For fertilizer, most national regulatory and legal frameworks are at a different stage than is the case for seed, which has received more attention both from national and regional regulators. This could ease the harmonization process in a way, since most EAC Partner States are starting the process at a relatively similar point. However, this also means that implementing harmonized rules could translate into higher costs. Among the main challenges for regional trade in fertilizers are prohibitively expensive fertilizer prices, likely due to restricted markets and high transport costs, and limited farmer knowledge on use of fertilizer. Almost all fertilizer used in the region is imported, which compounds transportation and storage costs, with much of this cost transferred to the farmer. Countries in the EAC will not only have to invest in capacity building and extension, they will also have to streamline cross-border procedures to reduce the cost of importing fertilizer and invest in storage and quality control. Furthermore, while fertilizer subsidy programmes are common within the EAC Partner States, many governments face financial challenges to sustain these programmes, and most subsidy programmes, unless designed and tailored as "smart subsidies" run the risk of having negative effects on the market that could consequently discourage private sector investment.

The assessment will address both specific challenges for seed and fertilizer and overarching issues that will need to be addressed to promote effective harmonization of regional rules, such as coordination and cooperation between dedicated national authorities. The national authorities for seed and fertilizer within the EAC Partner States will need to share data with each other and mutually recognize both data and regulatory procedures from other Partner States. According to stakeholders, this remains a major challenge to movement of seed and fertilizer within the region. Improving mutual recognition can, however, further lower costs for collecting and processing data as well as reduce market costs overall.

Finally, the EAC Seed Bill and EAC Fertilizer Bill will both advance international law in several areas. For seed, the EAC Seed Bill is the first regional regulation on seed that includes Plant Variety Protection (PVP) and Plant Breeders' Rights (PBRs), which is a notable good practice. The approach followed in the EAC Seed Bill adheres to the International Convention for the Protection of New Varieties of Plants of December 2, 1961, as Revised at Geneva on November 10, 1972, on October 23, 1978, and on March 19, 1991 (UPOV Convention) of the International Union for the Protection of New Varieties of Plants (UPOV). Countries like Kenya and Tanzania are already members of UPOV, and the legal systems in Uganda and Rwanda also follow UPOV as members of the African Regional Intellectual Property Organization (ARIPO), which adopted the UPOV 1991 Convention through the Arusha Protocol. Burundi and Uganda have adopted national legislation on PVP that differ from

UPOV 1991 Convention to an extent, given that they still allow farmers to use saved seed from previous crops for future use and for exchange with other farmers. This practice, also known as "farmer's privilege," is considered an important practice for inclusive seed systems and is allowed under the UPOV 1978 Convention, but the UPOV 1991 Convention allows members to limit the scope of plant breeders' rights within certain parameters. This is one of the provisions that could be included in the regulations to the EAC Seed Bill, considering that some EAC Partner States already recognize farmer's privilege. When implementing the EAC Seed Bill and the regulations that shall be made thereunder, propagation should be interpreted as allowing farmers' privilege to avoid any conflicts. Another implementation challenge flagged by stakeholders relates to the novelty requirement that narrows the scope of protection to new varieties. The UPOV 1991 Convention limits the time frame for which breeders can apply for PVP protection to one year after seed has been offered for sale or marketing in the territory of the country where protection is being sought or four years when the variety has been sold or marketed in any other state. Stakeholders have expressed concern regarding varieties that have been in the market for periods of time that are outside of this scope.

For fertilizer, the EAC will be the first region outside of ECOWAS to harmonize fertilizer regulation. While ECOWAS provides a useful benchmark, existing regulatory practices within the EAC may call for different approaches. For example, registration of fertilizer is already common within the EAC region, and EAC Partner States have prioritized an approach that streamlines registration efforts rather than eliminates registration of fertilizer. While this is a notable difference between the EAC and ECOWAS rules, other good practices, such as the right of appeal and confidentiality, do track with the precedent that ECOWAS sets.

Even though regional harmonization for seed and fertilizer will come with some challenges, the benefits of doing so could also be monumental. The EAC Partner States have already invested significant efforts in developing their agricultural sector. Once the regional harmonization rules developed under the EAC are adopted, Partner States will have the potential to produce many varieties of seed that can be integrated into the continental and international markets to benefit farmers, producers, consumers and the governments as a whole. Harmonization then could help boost regional and international trade and bring gains to all the stakeholders involved.

Table 1: EAC Partner States Status Regarding Seed and Fertilizer Good Practices and Main Challenges

Seed					
Dedicated National Seed Authority and National Variety Release Committees					
Burundi	**Kenya**	**Rwanda**	**South Sudan**	**Tanzania**	**Uganda**
• National Seed Control and Certification Office (ONCCS) is the main NSA. • The Department of Plant Protection is the NPPO. • There is a NVRC (Comité Technique National d'Homologation des Varietés), which recommends to the National Seed Committee which varieties to approve. • National Seed Committee (Commission Nationale Semencière) advises the ministry on varieties to be released and registered based on the NVRC recommendations. • The Institut des Sciences Agronomiques du Burundi (ISABU) is the National Research Institute for Burundi	• Kenya Plant Health Inspectorate Service (KEPHIS) is the designated NSA and NPPO. • National Performance Trials Committee (NPTC) • National Variety Release Committee (NVRC)	• The National Seed Variety Release Committee (NSVRC) is under the scope of the Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA), according to the regulation. Since RICA is not yet physically established, the NSRVC is currently under the scope of the Ministry of Agriculture and Animal Resources (MINAGRI). • Plant Variety Evaluation, Certification and Registration Committee • *RICA is not yet physically established. Rwanda Agricultural and Livestock Inspection and Certification Service (RALIS) is currently handling some of RICA's functions.* • NVRC	• Ministry of Agriculture and Food Security (MAFS) is the designated NSA and NPPO. • NVRC composed of the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), Alliance for a Green Revolution in Africa (AGRA), and companies/representatives from the Seed Trade Association of South Sudan (STASS).	• Tanzania Official Seed Certification Institute (TOSCI) is the designated NSA. • Tanzania Plant Health Services Section under the Ministry of Agriculture is the designated NPPO. • National Seeds Committee and two committees under its scope, the National Performance Trial Technical Committee (NPT-TC) and the NVRC • Zanzibar currently has the same authorities but is working on establishing the Seed Control Authority of Zanzibar.	• National Seed Certification Services (NSCS) is the designated NSA. • The Phytosanitary and Quarantine Division of the Department of Crop Inspection and Certification is the designated NPPO. • NVRC • National Seed Board • Uganda Plant Health and Inspectorate Agency (UPHIA), to be established, designated by the recently drafted Uganda national seed policy.
Streamlined Variety Release and Registration Process with National Variety Catalogue					
Burundi	**Kenya**	**Rwanda**	**South Sudan**	**Tanzania**	**Uganda**
• Law No. 1-08 of 23 April 2012 on the organization of the seed sector. • ONCCS receives applications for release of varieties and conducts Distinctness, Uniformity, and Stability (DUS) and	• The Seeds and Plant Varieties Act of Kenya, along with the other Laws of Kenya mentioned above, establish the process for variety evaluation, release, and registration in Kenya	• Applications for variety release and registration are submitted to the Plant Variety Evaluation, Certification and Registration Committee. • Seeds undergo two seasons of DUS and VCU tests conducted by the	• South Sudan's Seed Policy has been at a draft stage since 2016, and the process for variety release and registration is guided by the Variety Release Guidelines, issued by the MAFS. • South Sudan requires new varieties to undergo two	• Tanzania's Seed Act 2003 (Amendment 2014) and the Seed Regulations 2007 (Amendment 2017) establish the process for variety release and registration in Tanzania. Applications for variety registration are presented	• The National Seed Certification Services is mandated to conduct all variety testing and register varieties on to the National Variety List and the Common Catalogue following release, although

Value for Cultivation and Use (VCU) tests. • ONCCS conducts and closely supervises testing in the fields of the applicant. • Seeds from outside the EAC undergo two seasons of DUS and VCU testing. Seeds registered in any of the EAC Partner States is tested for one season of DUS and VCU. • Ministry of Agriculture approves applications, based on the recommendation of the NSC, and includes varieties in the National Seed Variety Catalogue.	• Application for variety release and registration is made before KEPHIS • Seeds undergo two seasons of DUS and VCU tests. • Plan varieties released in countries within a regional bloc of which Kenya is a member undergoes one season of VCU or National Performance Trials (NPT). • Plant varieties released in at least two countries within a regional bloc of which Kenya is a member may apply for an exemption from NPT. • *Stakeholders have reported that the release process in Kenya remains long, costly, and bureaucratic.*	registrar of the Plant Variety Evaluation, Certification and Registration Committee. • Varieties released in two other Member countries within regional or international organizations to which Rwanda is member are exempted of DUS. However, varieties are submitted to NPT tests for at least one season since the Ministry of Agriculture considers Rwanda to have unique agro ecologies • *According to government stakeholders, Rwanda maintains a streamlined procedure for varieties already released in one other Member within the EAC.* • *Companies reported that Rwanda's additional NPT test for released varieties due to Rwanda's unique agroecological conditions is burdensome.*	seasons of DUS testing and one season for NPT testing in six agro ecological zones. • South Sudan admits a streamlined procedure for varieties already registered and released in another EAC Partner State and only requires NPT. • South Sudan has a list of registered varieties, but it is not public. • *Companies consulted expressed a lack of understanding of the variety release process.* • *Seed companies did not know of the existence of a NVRC and noted that South Sudan's national catalogue is not publicly available, while others were unsure whether it exists at all.* • *Companies also highlighted a conflict since the Directorate of Research under the MAFS is both the main breeding institution in South Sudan and the authority with the ultimate decision on variety release. However, during national validation meetings, it was reported that the variety release and registration process was under the scope of the Directorate Plant Protection, and thus no conflict of interest exists.*	by the registered breeder to TOSCI. • Seeds undergo two seasons of DUS and one season of NPT conducted by TOSCI (accompanied by two recent previous seasons of advanced yield trial data collected by the applicant). • Varieties submitted with DUS results from recognized authority or organization or any country with which Tanzania is in agreement are exempted from DUS testing. • Zanzibar currently applies the same legal instruments but is working on a Draft Seed Law that would not require registration of vegetable varieties. • *Companies have reported that the NVRC is not well funded and, as a result, it does not meet as often as it should. They reported that there have been instances in which companies have paid to hold a meeting of a NVRC task force to verify required information. TOSCI clarified that the NVRC sits twice a year and has its own budget, but an applicant can request that the NVRC meet at his/her own expense.* • *Companies have expressed concern about samples submitted to TOSCI have gone missing and needed to be replenished. TOSCI*	its resource constraints affect some of its functions. • Seeds undergo two seasons of DUS conducted by NSCS, and NPT conducted by NSCS jointly with National Agricultural Research Organisation (NARO) • Uganda does not admit exceptions nor streamlined procedures for DUS and NPT. • *Field consultations show some contradictions in relation to the authorities currently performing the testing for variety release. Some stakeholders reported that Uganda's National Research Organization (NARO) used to perform the testing because it had the capacity to do so, and NSCS didn't, but that the NSCS is taking back the role of testing from NARO. However, other stakeholders reported that NARO is still doing variety testing.*

				clarified that sometimes samples are misplaced when the applicant does not follow the procedures on submission of samples.	
Standardized Quality Control and Packaging Requirements					
Burundi	**Kenya**	**Rwanda**	**South Sudan**	**Tanzania**	**Uganda**
• Burundi's process for seed certification is based on COMESA's 2014 Seed Regulations. • Certification processes should follow OECD, ISTA, and Association of Official Seed Analysts (AOSA). • Burundi allows for three seed classes: pre-basic, basic seed and certified seed. • *Only 10 percent of all seeds are certified, while 90 percent are within the informal sector.* • *Burundi does not have ISTA accredited laboratories.* • *Burundi does not have ISTA accredited laboratories due to limited personnel and lack of up-to-date equipment in the two National Seed Laboratories.*	• KEPHIS regulates the seed certification process under its Seed and Plant Varieties Act and Seed Regulations. • Kenya maintains quality standards and inspections, both at the field level and during seed processing, in accordance with its Seed Regulations and OECD standards. • Kenya has ISTA accredited laboratories. • Kenya allows the authorization of private seed inspectors and has commissioned a few since this regulatory change went into effect. Some companies have been authorized to conduct field inspections. The number of private inspectors varies within companies. • Kenya allows for six seed classes: breeder, pre-basic, basic, certified first generation, certified second generation, and standard seed. • Kenya has developed a scratch-off system to address counterfeit seed. • *Companies consulted reported that the costs of inspection remain high.* • *Companies also reported that training of private seed inspectors conducted*	• RICA supervises the seed certification process. *However, since RICA is not yet operational, Rwanda Agriculture and Animal Resources Development Board (RAB) continues to manage certification of seed, inspections and laboratory tests in collaboration with RALIS.* • Certification and inspection will still be conducted by MINAGRI and RAB. • According to government stakeholders, Rwanda has four seed classes (pre-basic, basic, certified first generation, certified second generation), and quality declared seed (QDS). • While government stakeholders stated that Rwanda's procedures have been updated and are clear, private stakeholders have reported that Rwanda's procedures are still being implemented since the process is not clear yet. • *While stakeholders have reported high costs of inspections and certification as major issues, it was reported during national validation meetings that there were*	• Almost all seed in South Sudan is imported. • Most imported seeds are sold to NGOs, which often require seed companies to acquire proof of certification from the MAFS. • *Currently South Sudan does not have regulations on seed certification or seed classes, and there are only guidelines from the Directorate of Research office.* • *Government stakeholders expressed that the Draft Seed Policy admits several seed classes* • *South Sudan does not have ISTA accredited laboratories. It has been reported that there are some laboratories with the necessary equipment, but they are not functioning due to lack of technical personnel and financial resources.* • *While Government delegates reported that the ministry does not charge fees for breeding and inspection, stakeholders have reported that there are no standard fees for inspection, meaning that payment is based on the bargaining power of the applicant.*	• Tanzania's certification process is regulated under the Seed Act of 2003 (as amended in 2014) and the Seed Regulations of 2007 and 2017 amendment. • Zanzibar's certification process is currently also regulated under the Seed Act of 2003 (as amended in 2014) and the Seed Regulations of 2007 and 2017 amendment. • Tanzania follows the OECD seed schemes and ISTA standards. • Tanzania has an ISTA accredited laboratory. • *Zanzibar does not have laboratories for testing, samples are sent to mainland for testing.* • TOSCI inspectors carry out field inspection and, when applicable, assign a seed class to the seed inspected. • Zanzibar does not have seed inspectors. TOSCI inspectors carry out inspections in Zanzibar, but the process has been reported to be very expensive. • Tanzania allows for four seed classes: pre-basic seed, basic seed, certified one, and certified two. • Tanzania recognizes the use of QDS as an	• Uganda's Seed Certification Service regulates the certification process under the Seed and Plant Act or 2006 and the 2017 Seed and Plant regulations. • It has the mandate of field inspection, testing, labelling, sealing, and certification in accordance with the seed regulations and OECD standards. • Uganda allows for six seed classes: breeder, pre-basic, basic, certified first generation, certified second generation, and standard seed. • Uganda currently recognizes the use of QDS as an alternative method of quality assurance. • *As a result of capacity and resource inadequacies, Uganda lost its membership in ISTA, and the government currently does not have an ISTA accredited seed laboratory.* • *Companies consulted noted that the certification process is quite clear, but the main challenge is that Uganda's Seed Certification Institute lacks capacity and has only seven inspectors and three working vehicles, which*

	by KEPHIS is prohibitively expensive, and that none of the trained private inspectors have been fully allowed to conduct inspections yet, because most companies do not have laboratories that meet the required standards. • *Companies reported that Kenya's scratch-off labels added a cost that is further transferred to the farmers.*	*no costs for inspection in Rwanda and that the only fee is 2,000RWF for conducting the laboratories tests.* • *Rwanda does not have ISTA-accredited laboratories, but it is in the process of doing so by putting in place testing equipment and training staff* • *Rwanda has limited staffing, inspectors, infrastructure, and insufficient funds to carry out the certification process.*	• *Stakeholders reported that the price of improved seed in South Sudan is prohibitively high, due to the many taxes and fees imposed on improved seeds.* • *Companies also reported that lack of coordination among departments of the same ministry, along with insufficient resources, have been main challenges to the growth of the seed sector.*	alternative method for ensuring availability of quality seed within farmers' vicinity. • *Companies have reported that the formal seed certification process can be lengthy and expensive in practice.* • *TOSCI's limited resources, lack of inspectors, and delays in inspections are the main challenges companies identified as affecting the certification process and seed quality.* • *Companies also noted that in most cases they incur more costs than the fees stipulated in the regulations, such as transportation for inspectors, allowances, and photocopying expenses, among others. TOSCI refuted this and affirmed that the only fees charged are those specified in the regulations.* • *Another major challenge is the sale of counterfeit seed. Tanzania adopted a mandatory scratch-off system to address the problem of counterfeit seed. While companies noted this to be expensive, TOSCI mentioned that it is a small and necessary cost to address a big challenge in the seed sector.* • *Zanzibar stakeholders reported that it takes a long time to receive results from tests carried out on the mainland.*	*are usually out of fuel. This causes delays in the inspection and certification.* • *Counterfeit seed is another major challenge to Uganda's seed industry.*

Standardized Phytosanitary Measures and Cross-border Requirements					
Burundi	**Kenya**	**Rwanda**	**South Sudan**	**Tanzania**	**Uganda**
• Burundi requires that imported seeds comply with phytosanitary international standards and be accompanied by a certificate of origin and an import permit. • Once a seed variety is imported, it is subjected to laboratory testing with requisite fees. • Burundi has a pest list available at the Ministry of Environment, Agriculture and Livestock, under the department of Plant Protection. • *The importation of hybrid seeds requires import permits and approval of the Plant Protection Department.*	• KEPHIS issues import and export permits and phytosanitary certificates, and also controls seed merchant's registration, which is required for the importation and exportation of seeds. • To ensure plant health and safety, KEPHIS has officers and inspectors at points of entry and exit. • Imported seed must be accompanied by an ISTA orange certificate and a phytosanitary certificate. • Seed is subjected to laboratory analysis tests upon importation. • *Kenya's pest list is outdated.* • *Stakeholders have also reported that Kenya lacks trust in other countries' pest lists, which poses a challenge to cross-border trade.*	• Importation and exportation of seed is regulated under the Seed Law and Ministerial Order no 007/11.30 of 11/04/2017. • A license is required to import or export seed. • To import registered seed, a dealer must apply to RICA for an import permit. • Any imported seed must be of a variety that is registered in the plant variety list and must comply with minimum seed standards, including packaging and labelling standards. • The exported seed must be accompanied by an export permit from RICA and a phytosanitary certificate; it must comply with regional seed standards and be properly packaged and labelled. • *Since RICA is not yet operational, RALIS is handling the procedures of import and export of seed.* • *Government stakeholders stated that Rwanda has adopted a pest list and it is available, although stakeholders mentioned that it is not publicly available..* • *Companies reported that the government's subsidy program, through which most seed is imported, interferes with the price of seeds.*	• An import permit is required from the Department of Plant Protection under the MAFS. • *There are no specific legal requirements or streamlined processes on the importation of seed to South Sudan.* • *Practices are inconsistent and often depend on the importer's bargaining power.* • *South Sudan does not have a formal procedure for testing imported seed.* • *There are laboratories at the Nimule, Kaya, and Nadapal borders with the necessary equipment, but they are not yet used due to lack of skilled technical personnel and financial resources. .* • *NGOs usually require proof from the MAFS that the seed is certified, while certification is usually not required if the final consumer is a farmer.* • *South Sudan does not have a pest list.*	• Importers and exporters of seed in Tanzania must be registered by TOSCI. • An application for import or export is submitted to TOSCI, which issues the corresponding permits. • MAFSC publishes the seed varieties that may be imported and sold in Tanzania, and such seed must comply with the quarantine requirements in the Plant Protection Act. • A pest list is published in the Gazette. • Zanzibar currently shares the same procedure with Tanzania for Standardized Phytosanitary Measures and Cross-border Requirements.	• Seed merchants must be registered and must apply to Uganda's Seed Certification Service for a permit to import seed. • Imported seeds must be accompanied by an orange certificate and a phytosanitary certificate in accordance with the Plant Health Protection Act of 2015. • Once imported, seed is tested to assess whether it meets standards. • *Uganda has adopted a pest list, although it is outdated, which creates a challenge for cross-border trade.* • *Uganda intends to adopt and operationalize the Plant Health Inspectorate Agency according to the Seed Policy.* • *Consultations with stakeholders revealed that Uganda's Certification Service has capacity gaps, including limited funding, few inspectors, no laboratories at the border, and few vehicles for field transportation of inspectors.* • *Uganda's Certificate Service has only one functional laboratory, which is under equipped and lacks skilled personnel.*

		• *Companies also reported extra costs to comply with packaging requirements, due to Rwanda's ban on imports or use of single-use plastic items.*			
Legal, Regulatory, and Institutional Framework for Plant Variety Protection					
Burundi	**Kenya**	**Rwanda**	**South Sudan**	**Tanzania**	**Uganda**
• Burundi adopted the Decree No. 100/55 in 2013 on PVP to protect plants and grant breeders' rights. • Burundi received assistance from UPOV to develop its decree. • Burundi's Decree includes most of the provisions incorporated in UPOV 1991. • *Burundi preserves farmer's rights to use saved seed and traditional varieties.*	• Kenya is a member of UPOV and has aligned its regulations with the UPOV 1991 Convention. • Kenya adopted the Seeds and Plant Varieties (Plant Breeder's Rights) Regulation in 2015, to grant and protect plant breeders' rights. • KEPHIS is the recognized institutional authority for enforcing plant breeder's rights under the Seeds Act. • As a member of ARIPO, Kenya must comply with the Arusha Protocol on PVP that aligns with the UPOV 1991 Convention.	• Rwanda's main legal instrument for Plant Breeders Rights (PBR) is Law No.005/2016 of 05/04/2016 Governing Seed and Plant Varieties, which was followed by several ministerial orders. • The PBR registrar supervises the registration process in Rwanda. • The PBR registrar in charge of conducting the required tests. *However, there is need for capacity building. There are no forms for registration yet, so the registrar is implementing UPOV mechanisms in the meantime.* • The Ministry aims to achieve some registrations by the end of the year. • As a member to ARIPO Rwanda must comply with the Arusha Protocol on PVP that aligns with the UPOV 1991 Convention. • *Consulted stakeholders have reported the lack of protection under PBR as an issue.*	• South Sudan does not have any legislation on PBRs or PVP, although the Draft Policy includes provisions related to this issue • *All the varieties in the national seed catalogue are publicly bred varieties, and the Variety Release Guidelines require any seed grower to pay a research or royalty fee in order to use them.* • *Some consulted seed companies noted that they were unaware of the existence of provisions related to research or royalty fees.*	• Tanzania is a member of UPOV and has adopted the Plant Breeders' Rights Act of 2012and the Protection of New Plant Varieties (Plant Breeders' Rights) Regulations of 2018, which aligns with the UPOV 1991 Convention. • The key regulatory body for PBRs is the PBRs Office, established under the PBR Act, with the mandate of granting plant breeders' rights; maintaining the PBRs register; facilitating the transfer and licensing of PBRs; coordinating with domestic, regional and international bodies on all issues relating to PBRs; and performing any other related functions. • As a member of ARIPO, Tanzania must comply with the Arusha Protocol on PVP that aligns with the UPOV 1991 Convention. • Zanzibar grants protection for PBRs through its Act No. 1 of 2014, containing provisions substantially equivalent to Tanzania PBR Regulations. • *Companies noted that their biggest challenge with PBR regulation is*	• Uganda adopted the Plant Variety Protection Act in 2014, which establishes PBR. • It creates the Plant Variety Protection Office in the Ministry of Agriculture, and a registrar with the mandate to receive and examine applications for the registration of PBRs; assign the testing of the variety to the seed certification unit or another relevant body; publish applications of PBRs in the gazette; publish objections against an application and conduct a hearing on the objection; and register and issue certificates for plant breeder's rights. • As a member of ARIPO, Uganda must comply with the Arusha Protocol on PVP that aligns with the UPOV 1991 Convention • *Uganda's PVP Act was preserves the protection of farmer's rights to use saved seed and traditional varieties.* • *During national validation meetings it was reported that the PVP Act does not provide protection to indigenous varieties, which represent 95*

				inadequate knowledge on the issue. • *Companies reported that the novelty requirement for one year restricted their PBRs over varieties already commercialized.*	*percent of seeds in Uganda.*
Fertilizer					
Dedicated Fertilizer National Authority					
Burundi	**Kenya**	**Rwanda**	**South Sudan**	**Tanzania**	**Uganda**
• Not yet established. • The Department of Fertilizer within the Ministry regulates these matters in Burundi.	• Kenya established the Fertilizer Board of Kenya, although it is not yet operational, and the fertilizer industry is still being regulated by the Veterinary Services Board.	• RICA is mandated to regulate trade in fertilizer. However, because it is not physically established yet, RALIS and MINAGRI are currently registering fertilizers, licensing dealers, conduct inspections and issue export and import permits.	• South Sudan does not yet have regulation on fertilizers, although the Ministry has developed a draft Fertilizer Policy.	• Tanzania established the Tanzania Fertilizer Regulatory Authority (TFRA) as the national regulatory body for fertilizers. • Zanzibar does not have its own authority for fertilizers.	• Uganda established the Agro Chemicals Board under the Agro Chemicals Control Act to regulate, register, and verify the quality of fertilizers traded.
Streamlined Fertilizer Registration Requirements					
Burundi	**Kenya**	**Rwanda**	**South Sudan**	**Tanzania**	**Uganda**
• The government of Burundi has a subsidy programme in place for importation of fertilizer for farmer crops. • Fertilizer companies place bids, and those that are successful are given licenses to import. • In 2019, Burundi contracted a local fertilizer company (FOMI) to supply subsidized fertilizer to farmers. • Fertilizer for cash crops will continue to be imported, since it is not under the subsidy programme. • Currently, there is a short list of companies that can import fertilizer for	• *Kenya does not currently have registration or licensing (except for a license to sterilize products of animal carcass for fertilizer) requirements for fertilizers.* • Kenya is currently in the process of operationalizing the Fertilizer and Animal Foodstuffs Board with the mandate to regulate, promote, and develop the fertilizer sector and related advisory services. • *Stakeholders have reported that the absence of requirements on who can trade in the industry*	• Dealers must present an application for fertilizer registration to RALIS, providing information on the properties of the fertilizer, samples of the product, samples of the labels, and packaging, with proof of sufficient technical knowledge on fertilizer. • Fertilizers are tested for a minimum of two crop-growing seasons to assess if they are safe to human health. Besides registration of fertilizer produce, dealers in fertilizer, whether importers, exporters, distributors, or retailers, are required to acquire a	• South Sudan does not have regulations on fertilizer registration.	• Tanzania's regulations provide an application processes for registration of fertilizers and fertilizer supplements and licensing of fertilizer dealers. • The 2011 Fertilizers Regulations (as amended in 2017) require field testing for one season, in at least two agro-ecological zones.. • Zanzibar applies Tanzania's fertilizer regulations but is drafting its own fertilizer regulation. • During the national consultation and validation meetings, stakeholders from the	• Uganda's Agro Chemicals Board has the mandate to issue fertilizer import and export licenses. • However, due to the lack *of regulations to guide the Board's activities, the process of licensing, registration, and issuance of import and export permits by the Agro Chemicals Board is not streamlined.* • *There are mini laboratories at the One Stop Border Post Program (OSBP) borders, but they are not yet active.*

farmer crops. Burundi has several guidelines issued by the Ministry of Agriculture on registration and approval of distributors. There are also gazetted warehouses for fertilizer under the subsidy programme. • *Burundi lacks a regulatory system for registration of traders, testing of fertilizers, and certification at the border. Private stakeholders have reported the difficulty accessing dollars within the country as the main challenge to transact and purchase fertilizer from outside the country. However, government stakeholders have reported that access to dollars for agriculture is not an issue, since market access to fertilizer is a priority.* \	*has led to the increased sale of fake fertilizers.* • *Stakeholders noted that the Fertilizer Board established under the 2015 amendment to the Fertilizers and Animal Foodstuffs Act, will address challenges in the fertilizer industry, including recommending to the Minister rules on product registration and fertilizer dealers' licensing.* • *Companies believe that the subsidy programme is not financially sustainable, and the need to restructure such programme has been raised.* • *Stakeholders reported that some of the fertilizers under the subsidy programme have been fraudulently repackaged and sold on the market or even exported to nearby countries.*	license from the registrar of agro chemicals. • The Rwanda Standards Board must accredit the testing laboratory. • During the national validation meetings, stakeholders noted the need to publish a charter or other public document with the legal requirements on fertilizer registration.		public sector mentioned that the fertilizer dealer registration process is online, when relevant data is provided, can be completed within twenty-four hours. • Private sector stakeholders, including companies, reported that the fertilizer registration process is lengthy, costly, and not easy to understand.	

Standardized Fertilizer Quality Control Requirements					
Burundi	**Kenya**	**Rwanda**	**South Sudan**	**Tanzania**	**Uganda**
• Once fertilizer reaches the borders, samples are drawn by the inspectors from the department of fertilizer and taken to ISABU for testing. ISABU then issues a report, upon which the fertilizer department accepts or rejects the importation of fertilizer.	• Kenya's major requirement for importation relate to testing and analysis of the fertilizer, to check to see if it meets the standards set by the Kenya Bureau of Standards (KEBS). • For a new fertilizer, the technical committee on fertilizer under KEBS, composed of stakeholders from the fertilizer	• The Rwanda Standards Board (RSB) sets standards for fertilizer based on those of the EAC. • The imported fertilizer is subjected to testing to assess its compliance with Rwanda's fertilizer standards. • RSB and the National Agricultural Export Development Board (NAEB) conduct the testing of fertilizer, while	• South Sudan does not currently have regulations on quality control for fertilizer.	• Fertilizer and fertilizer supplements must be tested based on analytical methods described in the third schedule of the regulations. • New fertilizer and fertilizer supplements must be subjected to field testing by TFRA or institutions authorized by the Director prior to registration for one season in at least two	• Currently, Uganda National Bureau of Standards (UNBS) inspects all imports, including fertilizers, and requires testing in the country of origin with Pre-Export Verification of Conformity (PVoC) attached for fertilizer of Free on Board (FOB) above USD 2000. • Fertilizers from EAC countries with mutually-

	industry, sits to set standards. • The samples of the imported fertilizer are inspected in accordance with the Fertilizer and Animal FoodStuffs (Samples) Regulations and analyzed in accordance with the Fertilizer and Animal FoodStuffs (Analysis) Rules. • After analysis, the importer may be issued an analysis certificate in the form prescribed in the rules. • *Private sector stakeholders mentioned that the regulation of Fertilizer and Animal FoodStuffs under the same act is improper, as the two are very distinct.*	RAB conducts the field testing. • RALIS inspectors inspect fertilizer for compliance with quality standards.		agro-ecological zones to determine its efficacy and suitability for use. • *Field consultations revealed limited capacity by TFRA to fully implement the regulations, including absence of a laboratory to do the testing, with samples often sent to the government institutions' laboratories, and trials are conducted at Tanzania Agricultural Research Institute (TARI) Centres..* • *During consultations, stakeholders noted an increasing level of sale of counterfeit and substandard fertilizer due to mishandling and raised the need to train farmers in identifying fake fertilizer and equip them with the skills to safely use fertilizer.* • *Zanzibar has one laboratory, but it is currently not well equipped to test fertilizers. Most fertilizer in Zanzibar is imported from mainland Tanzania by the government.*	agreed quality marks are inspected at the border and are exempted from PVoC and further testing at destination.

Standard Packaging and Labelling Requirements

Burundi	Kenya	Rwanda	South Sudan	Tanzania	Uganda
• The government has not yet put in place regulations on labelling and packaging of fertilizer, but the Burundi National Bureau of Standards is in	• The Fertilizers and Animal Foodstuffs (Packing of Approved Fertilizers) Rules, provide detailed requirements on how each type of fertilizer should be packaged.	• Rwanda's regulations comply with international conventions on environmental protection. • Regulations require the premises where the fertilizer is manufactured,	• No specific requirements	• The Regulations provide for labelling and packaging requirements. Tanzania prohibits packaging in polythene and plastic bags but makes an exemption for	• The Agricultural Chemicals (Control) Act provides requirements on packaging and labelling of fertilizer. • Fertilizer should not be packaged and labelled in a

the process of developing standards.		loaded, sold, stored, and repackaged to be registered. • The regulations also provide for labelling and packaging requirements, along with storage and use, banning the use of any non-biodegradable plastic bags. • RALIS conducts awareness to avoid use of counterfeit and adulterated fertilizer.		fertilizer, allowing the use of plastic bags as inner lining materials, with specifics on how the fertilizer should be packaged and labelled. • Zanzibar applies Tanzania's fertilizer regulations but is drafting its own fertilizer regulation.	manner that is false, misleading or deceptive or is likely to create an erroneous impression regarding its character, value, quality, composition, merit or safety.

Introduction

The EAC's efforts to harmonize seed and fertilizer come at a particularly critical time, since agricultural inputs such as seed, fertilizer, and agrochemicals have been identified as priorities to drive agricultural productivity and food and nutrition security. These harmonization efforts will be important next steps in operationalizing the EAC Common Market Protocol and align with the EAC's regional compact with the Comprehensive Africa Agriculture Development Programme (CAADP), which was signed in 2017.[2]

Throughout sub-Saharan Africa, regional harmonization holds great promise for linking markets and achieving economies of scale, creating opportunities along value chains, and improving livelihoods across sectors, including agriculture.[3] Regional harmonization is particularly critical for building Africa's markets for agricultural inputs, including seed and fertilizer, in order to ensure an adequate supply of high-quality inputs, link supply with demand, and generate long-term investment viability and productivity gains through access to broader markets. Harmonizing legal and regulatory frameworks on seed and fertilizer at the regional level will also be critical for facilitating investment, increasing the availability of high-quality agricultural inputs, and improving trade across borders.

For seed, the benefits of regional harmonization have been widely assessed[4] and include, for example, the potential to lower barriers for the movement of seeds across borders, simplification and increased transparency of procedures in critical areas like export/import licenses, streamlined certificates of origins, reduced regulatory costs, and improved sanitary and phytosanitary (SPS) controls.[5] Regional harmonization efforts will also streamline and shorten procedures for evaluating and releasing new seed varieties; make rules on quality control and certification more uniform across countries; strengthen the design and application of SPS systems; bring together rules on plant variety protection to encourage breeders to develop new crop varieties; and improve rules and regulations that directly impact participation of the private seed industry in seed variety registration, release, certification, and trade.[6]

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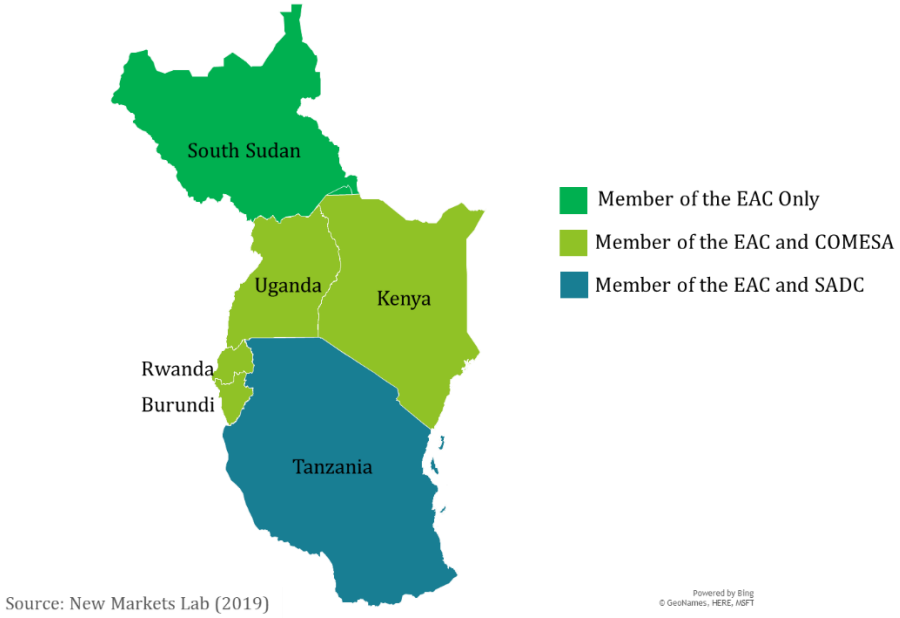
[2] EAC, "EAC Partner States sign CAADP Compact to transform Agriculture for inclusive economic development," EAC Website, 23 June, 2017.
[3] Kuhlmann, Katrin, Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment, Syngenta Foundation Seeds2B Initiative, September 2015.
[4] Isaac Minde, Harmonizing Seed Policies and Regulations In Eastern And Central Africa, International Food Policy Research Institute, (2006); Gisselquist, David. Harmonization of seed legislation and regulation in CEEC, CIS and Other Countries in Transition. Food and Agriculture Organization of the United Nations (2001).
[5] Kuhlmann, Katrin, Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment, Syngenta Foundation Seeds2B Initiative, September 2015.
[6] Kuhlmann, Katrin, Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment, Syngenta Foundation Seeds2B Initiative, September 2015.

A similar case could be made for fertilizer, which is also highly dependent on cross-border trade. Regional regulation of fertilizer movement and quality control procedures can be important for ensuring product efficacy, weight of shipping containers, and consistency of chemical components, with what has been declared. Quality control issues for fertilizer are also paramount and have significant implications across borders, and harmonizing rules can help trace fertilizer products and enforce fertilizer standards, ultimately helping to address the challenge of counterfeit or adulterated fertilizers.

In September 2018, the EAC drafted the East African Community Seed and Plant Varieties Bill (EAC Seed Bill). The EAC Seed Bill is still in draft form and is awaiting parliamentary approval. Once adopted by the EAC Summit and gazette it will become legally binding in the six EAC Partner States, which are also members of other regional communities, such as COMESA and SADC (Diagram 1). COMESA and SADC have also both developed and adopted regulations for the regional harmonization of seed regulations, namely the 2014 COMESA Seed Trade Harmonization Regulations (COMESA Seed Trade Regulations) and SADC Memorandum of Understanding on the Harmonization of Seed Regulations (SADC Seed MOU) and the SADC Harmonised Seed Regulatory System (SADC HSRS). The implementation of these regional regulations is still ongoing, but it will affect the implementation of the EAC Bill in countries that are members of more than one REC. Figure 1 below shows the overlap between membership in the EAC and COMESA and SADC.

Figure 1: EAC Partner States and Their Membership in COMESA and SADC



As the figure above shows, Burundi, Kenya, Rwanda and Uganda are members of both the EAC and COMESA, while, Tanzania is member of both the EAC and SADC. During the field

consultations, officials in South Sudan indicated that South Sudan has started the process of acceding to COMESA; however, it is not yet a member.[7]

ECOWAS is also relevant as a benchmark, and the primary legal instruments are 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 (ECOWAS 2008 Seed Regulations) and the ECOWAS Regulation C/Reg.13/12/12 Relating to Fertilizer Quality Control in the ECOWAS Region (ECOWAS 2012 Fertilizer Regulations).

Legal Nature of Regional Instruments and Key Differences Across Regions

Regional rulemaking usually happens at different levels and through different legal instruments, and these distinctions are important for the country assessment in Section I and the comparative assessment that follows in Sections II and III. Typically, countries and RECs adopt general instruments in the form of policies that define principles and strategies for guiding government actions. Policies do not tend to be binding, since they generally do not create obligations. Some of the EAC Partner States have adopted policies for the seed and fertilizer sectors, as noted in Section I. Regional bodies and governments also adopt laws or acts that function as binding legal measures. The EAC Seed Bill and Fertilizer Bill both fall under this category. Laws or acts are often accompanied by regulations, which are also legally binding, but differ from laws and acts in two ways. First, regulations are usually adopted through administrative, not legislative or parliamentary, which makes them more flexible and easier to change. Second, regulations tend to be more detailed than laws and will often operationalize the provisions contained in more overarching laws. Both the EAC Seed and Fertilizer Bills leave some obligations to be developed by further regulations. At the national level, most EAC Partner States have adopted some combination of laws and regulations governing seed and fertilizers, as noted in detail in Section I.

Another important note in this context is that regional rules and regulations will often need to go through a process of "domestication" at the national level in order to become fully actionable. In countries that follow a common law system, which is prevalent in the EAC, this will require going through a legislative or parliamentary process at the national level. In addition, many regional laws require corresponding changes in national law.

The EAC system is perhaps the most binding system of regional law within the four RECs assessed alongside ECOWAS. Consequently, all major legal instruments, including EAC Regulations, Directives, and Decisions from the Council of Ministers are binding upon the EAC Partner States.[8] In the event of legal conflict between the EAC rules and national rules,

[7] COMESA Member States, Website, available at: https://www.comesa.int/comesa-members-states/.
[8] Katrin Kuhlmann, "Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment," NML and SFSA, September 2015.

the EAC system will govern, and EAC laws will take precedence over conflicting national laws or regulations.

Article 8 of the EAC Treaty provides the foundation for EAC law and legally binds Partner States to the EAC Treaty and any other legal instruments adopted by the EAC Summit. When the EAC Legislative Assembly passes a bill, it is then sent to the EAC Summit for adoption. Once the EAC Summit adopts a bill, it is published in the EAC Gazette before it becomes binding on Partner States. As noted, different institutional structures are involved in the rulemaking process:[9]

1. The EAC Summit gives general directions and impetus;
2. The Council of Ministers sets policy, initiates bills, and declares standards;
3. The Coordination Committee submits reports and recommendations to the Council and implements its decisions as directed by the Council;
4. The Sectoral Committees submit reports and adopt implementation programs sectorally;
5. The East African Court of Justice functions as the regional judicial body;
6. The Legislative Assembly adopts the budget for the Community and deals with other administrative matters; and
7. The Secretariat administers matters on a daily basis and provides overarching support.

Once the EAC Seed Bill is enacted, it will become binding on the six Partner States, which will have to take appropriate measures, including the adoption of laws and regulations and other administrative actions, to ensure compliance with the Act.[10] While domestication is also necessary, an EAC Act requires that EAC Partner States must amend their national frameworks in order to comply with its obligations.

The other three RECs assessed and compared in this report –COMESA, SADC, and ECOWAS – approach rulemaking in somewhat different ways. In COMESA, Member States are also legally bound by measures, including the COMESA Seed Trade Regulations, which require domestication and implementation by the COMESA Member States. As of December 2018, COMESA reported that Burundi, Kenya, Rwanda, and Uganda, along with several other non-EAC countries, had harmonized their national seed rules with the COMESA Seed Trade Regulations. Within SADC, the SADC HSRS was adopted in the form of a MOU which is not automatically binding upon SADC Member States, meaning that SADC Member States are only legally bound once they have domesticated these rules into their national systems. In the case of ECOWAS, formal alignment of national regulatory frameworks with regional rules works a bit differently, particularly for countries that follow a civil law system, because the regional rules become part of a country's national legal framework in their entirety once

[9] East African Community, Treaty Establishing the East African Community, November 1999.
[10] East African Community Seed and Plant Varieties Bill (EAC Seed Bill), 2018, Section 54 and Section 56.

gazetted. However, a few ECOWAS countries, namely Ghana and Nigeria, have common law legal systems and follow a process of domestication similar to the EAC, COMESA, and SADC.

Formal alignment with regional regulations, either by incorporating them directly into national legal frameworks or amending national laws and regulations, is just a first step however. Countries must then implement and operationalize these rules in a way that makes them effective and enforceable. This practical implementation is more difficult to accomplish than changes to the rules themselves and poses additional challenges for countries, given that it often happens through a number of steps taken over time.[11] It also necessitates the coordination of private and public stakeholders who are involved in the process of implementing these rules. Even though having formal alignment of regional rules within national frameworks is a necessary first step, successful implementation of these systems often involves a series of smaller, day-to-day actions, rather than high-level commitments.[12] Consultations in the different EAC Partner States confirmed some of these challenges, for example concerns with following international standards like ISTA , limited staffing, general capacity for inspections and certification, and limited funds.

History of Legal and Regulatory Harmonization for Seed and Fertilizer in the EAC

In 2018, the EAC developed a harmonized Seed and Plant Varieties Bill to govern introduction, registration, and commercialization of plant varieties; certification, processing, distribution and marketing of seed; phytosanitary measures related to seeds; import and export of seed; and PVP systems in the EAC Partner States under the framework of the EAC Common Market Protocol. The EAC Seed Bill was validated in September 2018 and was subsequently adopted by the Sectoral Council on Agriculture and Food Security in December 2018. The Bill was further revised by the during the EAC meeting of legislative draftspersons in September 2019, and is currently awaiting parliamentary approval, upon which it will enter into force.

Before the EAC Seed Bill was developed, work on some aspects of seed regulation within the region, including streamlined variety release, had largely taken place through the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) and the Eastern and Central Africa Programme for Agricultural Policy (ECAPAPA).[13] The ASARECA/ECAPAPA Agreement, Monograph Series No. 4, is a non-binding agreement to harmonize regional variety registration procedures; however, the

[11] Katrin Kuhlmann and Yuan Zhou, "Seed Policy Harmonization in the EAC and COMESA: The Case of Kenya," NML and Syngenta Foundation for Sustainable Agriculture, September 2015.
[12] Katrin Kuhlmann and Yuan Zhou, "Seed Policy Harmonization in the EAC and COMESA: The Case of Kenya," NML and Syngenta Foundation for Sustainable Agriculture, September 2015.
[13] Katrin Kuhlmann and Yuan Zhou, "Seed Policy Harmonization in the EAC and COMESA: The Case of Kenya," NML and Syngenta Foundation for Sustainable Agriculture, September 2015.

agreement has become binding to the extent that it has been incorporated into the national regulations of participating countries.[14] Originally only Kenya, Tanzania, and Uganda had signed onto the ASARECA/ECAPAPA Agreement, and Rwanda, Burundi, and South Sudan have since followed.

Regional fertilizer harmonization efforts have an equally important but somewhat shorter history, which includes the Abuja Declaration on Fertilizers for an African Green Revolution adopted by the African Union (AU) Ministers of Agriculture in June 2006. The Abuja Declaration recognized organic and inorganic fertilizers as strategic commodities and also called upon AU Member States to accelerate farmers' access to fertilizer in the region by asking AU Member States and RECs to take measures to reduce the cost of procuring fertilizer at the national and regional levels through harmonization. It also urged an increase in the level of fertilizer use from the average at the time of eight kilograms (kg) per hectare (ha) to an average of at least 50 kg per ha by 2015. This goal remains unfulfilled; however, it shows that the regional bodies are aligned in recognizing the importance of fertilizer in the region.[15]

EAC harmonization of fertilizer began in 2013 when both seed and fertilizer were identified as priorities in the Regional Agricultural Inputs Systems Development project, which was implemented from 2013 through 2015. The project's main objectives were to develop harmonized laws, regulations, and policies for fertilizers and improved seeds that were consistent in all the EAC Partner States; review and revise fertilizer standards for each EAC Partner State to promote the free movement of fertilizers between countries; facilitate the establishment of a functioning fertilizer and seed regulatory systems in each EAC Partner State; and revise VAT rates on trade in fertilizer for each EAC Partner State to remove supply-side restrictions on fertilizer use. In 2014, the EAC Sectoral Council of Ministries of Agriculture, Livestock, Fisheries, and Food Security validated the EAC Regulatory Framework and Procedures for fertilizer. The Council of Ministries then directed the EAC Secretariat to undertake harmonization of fertilizer policies. Through the *Partnership Toward catalyzing the Implementation of CAADP-Malabo 2017-2020* with support from AGRA, the EAC Secretariat began drafting the Fertilizer Bill and Policy in 2019, which will then be vetted by the EAC Partner States.

In addition, other EAC legal instruments apply to agricultural inputs. In particular, the EAC Protocol on Standardization, Quality Assurance, Metrology and Testing and the EAC Standardization, Quality Assurance, Metrology and Testing Act set regional standards for seed varieties of certain crops, including seed potato.[16] A summary of the timeline for

[14] New Markets Lab and Syngenta Foundation for Sustainable Agriculture, "Regional Variety Release Test Cases: 2018 Findings," December 2018.
[15] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017
[16] Katrin Kuhlmann and Yuan Zhou, "Seed Policy Harmonization in the EAC and COMESA: The Case of Kenya," NML and Syngenta Foundation for Sustainable Agriculture, September 2015.

relevant regional milestones and input harmonization measures in the EAC is described in Table 2 below.

Table 2: Timeline of Regional Milestones and Seed and Fertilizer Harmonization Measures

Timeframe	*Measure*
Late 1990s	• Study by ASARECA identifies differences among the laws, policies, regulations and standards on seed and related areas of Kenya, Tanzania and Uganda
1997	• ECAPAPA created by ASARECA
1999	• Treaty for the Establishment of the East African Community signed by Kenya, Uganda and Tanzania. (Amended in 2006 and 2007)
2001	• EAC Protocol on Standardization, Quality Assurance, Metrology and Testing adopted
2004	• Eastern Africa Seed Committee (EASCOM) formed
2005	• EAC Customs Union established
2006	• EAC Standardization, Quality Assurance, Metrology and Testing Act adopted • AU Ministers of Agriculture adopt the Abuja Declaration on Fertilizers for an African Green Revolution
2007	• ECAPAPA converted into the Policy Analysis and Advocacy Program (PAAP)
2010	• EAC Common Market established
2011	• COMESA-EAC-SADC Tripartite Free Trade Agreement (TFTA) adopted • EAC Secretariat calls for support to improve seed quality to enhance seed trade
2013	• EAC announces two-year initiative to establish regional harmonization for maize, sorghum, sunflower, soybean, and groundnuts seeds • EAC Secretariat starts implementation of the Regional Agricultural Inputs Systems Development project, which mandated the development of harmonized laws, regulations and policies for fertilizers and improved seeds consistent across all the EAC countries
2014	• EAC Technical Committee meets to revise Draft East African Standards for maize, sorghum, sunflower, soybean, and groundnuts seeds. • The EAC Sectoral Council of Ministers of Agriculture, Livestock, Fisheries and Food Security validates and adopts the EAC Regulatory Framework Procedures for fertilizer marketing
2015	• EAC Elimination of Non-Tariff Barriers Act passed by Legislative Assembly • EAC Protocol on Sanitary and Phytosanitary Measures adopted by EAC Summit • EAC Secretariat implemented the Regional Agricultural Inputs Systems Development project from July 2013 to December 2015 • Permanent Secretaries Session of the 8th Sectoral Council on Agriculture and Food Security held in April 2015 considered and adopted TORs for harmonization of Seed Laws and Regulations in the EAC • Ministers directed the EAC Secretariat to undertake harmonization of fertilizer policies by June 2015 and develop TORs or the development of a production strategy for fertilizer
2018	• EAC Harmonized Seed and Plant Varieties Bill and regulations developed to govern introduction, registration and commercialization of plant varieties; certification, processing, distribution and marketing of seed; phytosanitary measures on seeds, import and export of seed; and PVP systems in the EAC Partner States under the framework of the EAC Common Market Protocol

	• EAC Seed Bill validated in September 2018 and subsequently adopted by the Sectoral Council on Agriculture and Food Security in December 2018
2019	• AfCFTA entered into force on 30 May 2019; as of August 2019, Kenya, Uganda, and Rwanda had deposited instruments of ratification; Tanzania, South Sudan, and Burundi had signed the agreement, but had not yet deposited their ratification instruments[17] • EAC Secretariat drafts the EAC Fertilizer Bill and Policy.

Source: New Markets Lab, derived from research and adapted from Katrin Kuhlmann, "Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment," SFSA, September 2015.

As the previous table shows, seed harmonization in the EAC started almost twenty years ago and has gone through various stages. The current harmonization efforts relate to other instruments and initiatives that have slowly but steadily worked to harmonize seed within the region. The EAC Seed Bill is, however, the most comprehensive and binding instrument and will become an essential building block in the EAC and within the harmonization process under the TFTA and AfCFTA.

[17] Tralac, "AfCFTA Ratification Brometer," tralac website, available at: https://www.tralac.org/documents/resources/infographics/2605-status-of-afcfta-ratification/file.html.

Section I: Economic Analysis, Country Snapshots, and Harmonization Costs and Benefits

Economic analysis is an important aspect of regional harmonization and has been conducted for this assessment using available data. This section includes a description of each country's status in terms of seed and fertilizer regulatory systems, including relevant issues noted during stakeholder consultations and national validation meetings, which allows conclusions to be drawn about the costs and benefits of regional harmonization for seed and fertilizer. Relevant legal and regulatory assessment, desk research, and extensive field consultations with private companies, government, and other stakeholders underpin this assessment. However, official government data is essential to the economic analysis as well, and obtaining this data has been a challenge. A more complete economic assessment follows based on a Spatial Equilibrium Model (SEM) that analyses the impact of a policy change on the welfare of the affected stakeholders. The mathematical approach applies a General Algebraic Modeling System (GAMS) using data available for the seed sectors in Kenya, Tanzania, and Uganda; additional data is needed for Burundi, Rwanda, and South Sudan, but region-wide impact can be extrapolated from the model, as discussed below. An economic assessment on the effects of harmonization in fertilizer for Rwanda, Tanzania, Burundi, Kenya, and Uganda was also incorporated after the National Validation Meetings held in September 2019. The data used was collected from primary and secondary sources.

The economic analysis is benchmarked against the obligations and requirements included in the EAC Seed Bill, which will require actions by the EAC Secretariat and Partner States, and the approach to the EAC Fertilizer Bill outlined in Section III. The current status of law and regulation in each Partner State is summarized in Table 1 above and described in detail below. For each country, a cost-benefit assessment has been included for both seed and fertilizer. Additional qualitative information provided during field consultations and the national validation meetings has been compared against the bill's requirements for the cost-benefit analysis.

The EAC Seed Bill creates a Community Seed and Plant Variety Committee composed of the heads of National Seed Authorities or their representatives, which is expected to be the coordination center at the regional level for all activities embedded in the seed and fertilizer bills.

Under the EAC Seed Bill, the Community Seed and Plant Variety Committee is expected to:

- Recommend to the Council the laboratories which may be designated to test and certify plant varieties as required by the EAC Seed Act;
- Recommend to the Council any new classes of seed or categories of crops required to be certified;
- Review the inspection and seed testing procedures and standard in the Community to facilitate uniformity and make recommendations to the Council;
- Approve plant varieties to be included in the Community Plant Variety Catalogue;

- Consider any application from a Partner State seeking to restrict the marketing of a certified plant variety in its territory and make recommendations to the Council;
- Handle complaints and proposals on the application and implementation of the EAC Seed Act;
- Assess compliance of Partner States in implementing the EAC Seed Act and make recommendations to the Council; and
- Make recommendations to the Council regarding matters required to be prescribed under the EAC Seed Act.

In consultation with the EAC Secretariat, these activities are to be assessed against the expected impacts (both positive and negative) to create a case for (against) the proposed bills at the EAC level. The impacts (benefits) accruing to the coordinating body (EAC Seed and Plant Variety Committee) are subject to an understanding of the obligations of the Partner States to the Community Seed and Plant Variety Committee with regard to its activities during the implementation process of the harmonized rules.

Related to the EAC Seed Bill, EAC Partner States are required to:

- Designate an entity to serve as the national seed authority;
- Designate a National Plant Variety Release Committee, which shall be responsible for evaluation and registration of new and existing plant varieties;
- Establish and maintain a National Plant Variety Catalogue that shall contain all plant varieties released by that Partner State;
- Develop regulatory procedures with respect to plant variety protection and grant of plant breeders' rights;
- Establish or designate existing entities to function as official seed testing laboratories;
- Designate National Plant Protection Organizations (NPPOs) to regulate and supervise the implementation of phytosanitary measures;
- Develop and maintain regulatory procedures with respect to variety release and registration (which follow a set number of tests for DUS and VCU), seed certification, seed trade, and PVP;
- Develop and maintain updated quarantine and non-quarantine pest lists for seeds; and
- Adopt the pest risk analysis procedures stipulated under the relevant international standards for pest management.

For the draft EAC Fertilizer Bill, the EAC is expected to:

- Establish the EAC Fertilizers List and approve fertilizers to be entered onto the EAC Fertilizers List;
- Develop and review the EAC Fertilizer Quality Control Manuals;
- Recommend EAC fertilizer standards to the Council to be developed and reviewed;

- Handle complaints and proposals on the application and implementation of the EC Fertilizer Act;
- Assess compliance of Partner States in implementing the EAC Fertilizer Act and making recommendations to the Council; and
- Make recommendations to the Council regarding matters required to be prescribed under the EAC Fertilizer Act.

With regard to the draft EAC Fertilizer Bill, EAC Partner States are required to:

- Designate an entity to serve as the national fertilizer quality control authority;
- Take appropriate measures, including the adoption of laws and regulations, administrative actions, levy penalties, and enforcement measures, to ensure compliance with harmonized fertilizer laws and regulations;
- Ensure enforcement of fertilizer quality standards;
- Liaise with the relevant regional and international authorities on matters related to fertilizer and follow appropriate standards;
- Facilitate the smooth movement of fertilizer throughout the region by coordinating with respect to inspections and clearance at the declared border posts; and
- Remove all unnecessary tariffs and duties that impede fertilizer trade in the region.

The following sections describe the regulatory framework for seed and fertilizer in the six EAC Partner States and identify the main costs and benefits that will arise with the implementation of the EAC Seed and Fertilizer Bills. It is worth noting, however, that if data on the anticipated public expenditure (costs) together with the current budget provisions and/or expenditures within the seed and fertilizer subsectors could be made available, a direct ex ante cost-benefit analysis quantified in monetary terms would be possible. The lack of availability of relevant data, therefore, presented challenges and led to application of a more comprehensive economic analysis approach under SEM using GAMS.

Nevertheless, it is important to note that even though the analysis in the second part of this section intends to make an estimation of the impact of the proposed policy change on the Partner States quantified in monetary terms, the data available for three of the EAC Partner States, namely Rwanda, Burundi, and South Sudan, as well as the data for fertilizer analysis from all the EAC Partner States was insufficient to run the SEM.

Burundi Regulatory Snapshot and Cost-Benefit Assessment

Regulatory Framework for Seed in Burundi

In Burundi, the national seed program was introduced in 1987; however, the commercial seed sector reportedly continues to face serious limitations. Currently, most farmers in Burundi use informal seeds characterized by traditional practices. Statistics from the African Seed Index Access (TASAI) reveal that one agro-dealer serves 36,000 farming households in Burundi, since there are only 41 agro-dealers country-wide, which limits access to improved seed.[18] Similarly, there is currently low access to extension services in Burundi, since there are only 472 extension workers country-wide, meaning that one extension worker serves over 3,298 households in the country. Also, as is currently the case, improved hybrid maize is accessed by famers at relatively high prices ($ 3.2 USD) per Kg and between 0.80 USD and 1.07 USD for OPV maize varieties.[19] Over 90 percent of the seeds used by farmers come from informal systems, even though seed companies such as FICA seed, Kenya Seed, and SeedCo have established their presence in the sector.[20]

Burundi's first decree on seed production and trade was promulgated in 1993 and emphasized four main components: developing a national catalog of crops and varieties; improving the production, import and commercialization of certified seeds; developing a seed control and certification system; and identifying the roles of all partners in the seed value chain. In 1999, the Ministry of Agriculture and Livestock signed a series of ordinances applying measures to the above decree, and Burundi's Seed Policy of 2012, Seed Law of 2012 (Law No. 1-08 of 23 April 2012 on the Organization of the Seed Sector) and Seed Regulations of 2016, are all harmonized with COMESA, of which Burundi is a Member State.

Other relevant legal and regulatory instruments include: the Decree Law No. 1/033 on Plant Protection in Burundi; Law No. 1/13 of 27 July 2017, Ratification by the Republic of Burundi the Protocol on Sanitary and Phytosanitary Measures of the EAC; Law No. 1/07 of 19 May 2009, amending certain provisions of Legislative Decree No. 1/032 of 30 June 1993 on the Production and Marketing of Plant Seeds in Burundi; Law No. 1-11 of 12 April 2006 on the ratification by the Republic of Burundi of the International Treaty on Plant Genetic Resources for Food and Agriculture adopted in Rome on 3/11/2000; and Law No. 1-10 of 23 March 2006 on the accession by the Republic of Burundi to the International Plant Protection Convention, signed in Rome on 6 December 1951 and revised in November 1997.

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[18] The African Seed Access Index: IFDC Seed Stakeholders' Meeting 19th July, 2019 Bujumbura Presentation Document.
[19] The African Seed Access Index: IFDC Seed Stakeholders' Meeting 19th July, 2019 Bujumbura Presentation Document.
[20] The African Seed Access Index: IFDC Seed Stakeholders' Meeting 19th July, 2019 Bujumbura Presentation Document.

Based on national legislation, the ONCCS is Burundi's main regulatory authority for seed, which oversees the processes of variety release and registration and certification of varieties. Another key regulatory institution is the national seed committee (CNS), an independent supervisory body under the scope of the Ministry of Agriculture and Livestock, which is mandated with an advisory role for the implementation of Burundi's National Seed Plan and Seed Law, the incorporation of varieties in the national catalogue, and the implementation of certification and inspection procedures, among other things.

Public research and breeding in Burundi are done by Belgian Technical Cooperation and ISABU. Production, processing and packaging is conducted by famers' cooperatives and ISABU. Other seed breeders include the department of Agriculture at the University of Burundi, the Faculty of Bioengineering, and the Indaba Agricultural Policy Research Institute. These public research institutes usually produce pre-basic seed.

Seeds in Burundi are required to undergo two seasons of DUS and VCU tests before they can be entered into the National Variety Catalogue. ONCCS receives applications for release of varieties and conducts and supervises testing in the applicant's fields. Imported registered varieties are evaluated for one season to assess suitability and adaptability; this process appears to be aligned with the EAC Seed Bill. After the tests are concluded, a technical committee analyses the test results and recommends release of a variety. Once a variety has been entered into the catalogue, it should be able to be freely multiplied and traded within Burundi's territory. The National Seed Variety Catalogue includes both new varieties and traditional varieties cultivated by farmers.

Burundi's regulatory authorities also oversee the certification of seeds to ensure their quality and performance, although major challenges exist due to the lack of resources. Once a variety is listed in Burundi's National Seed Variety Catalogue, multiplication of seed is regulated under a Ministerial Order. Producers intending to be registered as multipliers must present a request, certify that they have adequate storage and an agronomist, and present a business plan for three years and proof of ownership of a farmland. According to the regulations, there are two categories of seed multipliers, multipliers of pre-basic and basic seed and multipliers of basic to certified seed. Seed quality is verified by the Seed Inspection Department, which has inspectors that take field samples and analyze and test them in laboratories according to certification standards. The Ministry of Agriculture and Livestock is in the process of creating new fee schedules for seed certification, which is likely to increase the price of seeds.

Burundi's process for seed certification is based on COMESA's harmonized regulations and establishes that certification processes should follow the OECD Seed Schemes and ISTA and AOSA standards.[21] It should be noted, however, that despite the explicit reference to ISTA standards in Burundi's legislation, Burundi does not have ISTA-accredited laboratories and has limited personnel. This implies that, in order to comply with the proposed EAC Seed Bill, Burundi would have to meet some costs in terms of public expenditure.

[21] Ordonnance 770/183, 2015 on the System for Certification of Seeds, Burundi.

Burundi may need to broaden the scope of existing rules to include regional variety registration and other procedures. Additionally, Burundi would need to designate the relevant authority, presumably ONCCS, with the mandate to notify the EAC Seed and Plant Variety Committee of new varieties and withdrawals. Furthermore, Burundi should determine which authority would be in charge of providing regional seals and labels to seed producers and providing training for the implementation of the EAC Seed Bill at the national level. Burundi would also have to include a regulatory provision allowing for a streamlined regional variety release procedure, similar to the relevant provision in Kenya's rules, when a variety has been released in one or two Partner States.

Burundi's regulations also require that agro-dealers register in order to sell seeds. Agro-dealers are required to have a seed technician, room for storage, and authorization from the Ministry of Agriculture and Livestock in order to sell seeds. Currently, there are agro-dealers for maize hybrid and seeds for vegetables.

For importation, Burundi requires that seeds conform with international phytosanitary standards and be accompanied by a certificate of origin and an import permit. In addition, the Ministry of Environment, Agriculture and Livestock has adopted a pest list through the department of Plant Protection. The ONCCS is the main authority in charge of overseeing the importation process. Import permits are granted by the Ministry of Agriculture and Livestock, upon approval of the Plant Protection Department. Once a variety is imported, it is subjected to laboratory testing upon payment of fees. Currently importing seed into Burundi takes 44 days on average, which is significantly more than the 7 days it takes to import seed into Kenya.

Harmonization under the EAC Seed Bill will rely upon implementation of good practices by the Partner States, such as conducting border post controls, adopting pest risk analysis procedures according to international standards, maintaining and updating national quarantine and non-quarantine pest lists for seed, and adopting the EAC quarantine and regulated non-quarantine pest lists for seed. Adopting regional rules would not only have an impact in terms of reducing the duration of importation, but it would also allow the private sector to produce more seeds and leverage the available potential market both locally and regionally to enhance sales revenues and increase profits. However; it should be noted that timely implementation of national and regional rules and regulations is of the essence, since a lag in implementation could result in local producers facing competition from more established regional producers who could import their products. It is also important to note that some costs to seed companies could arise due to the need for farmer awareness programmes on usage and adoption of improved and certified seed.

Burundi has adopted Decree No. 100/55 in 2013 on PVP to grant and protect PBR. Although Burundi has not ratified the UPOV Convention, it has been in contact with UPOV for assistance in the development of its PVP Decree, which is based on UPOV.[22] Currently, Burundi's PVP Decree includes most of the provisions incorporated in UPOV 1991, although some provisions are slightly different. Burundi's PVP Decree maintains the same scope for

[22] UPOV, "Status in Relation to The International Union for the Protection of New Varieties of Plants (UPOV)", May 2019.

PBR as UPOV 1991, protecting the activities of production for purposes of commercial marketing, offering for sale, and marketing, importation, exportation, conditioning for the purpose of propagation, and stocking for any of the purposes mentioned above.[23] However, Burundi provides for the "farmer's privilege", allowing a common practice among smallholder farmers of saving a portion of seed each season to either use it in future season or exchange it with other neighboring farmers.[24] Under UPOV 1991, this practice is allowed to the extent that members provide for it in their law regulations. In its implementation, the EAC Seed Bill and accompanying regulations should be applied with the understanding that propagation allows saving seed for future use and exchange between farmers. The importance of the "farmer's privilege" provision has been raised by a number of seed sector stakeholders and allowing this practice to continue would help facilitate the implementation process.

The EAC Seed Bill includes the protection of PBR, based on UPOV. In particular, the EAC Seed Bill takes vocabulary and procedures from UPOV 1991. Harmonization of PBR and PVP under the EAC Seed Bill could help to preserve rights on protected varieties, expand knowledge on PBR and PVP, and render protection more enforceable. With respect to Burundi's system, the EAC Seed Bill does not include the "farmer's privilege," which should be considered with respect to Burundi's current legislation.

Overall, under harmonization, farmers would be expected to have increased access to more improved varieties from across the region. Farmer sensitization programs would be needed to increase local knowledge of improved seed and consequently boost the use and adoption of these seeds.

Burundi's Regulatory Framework for Fertilizers

In Burundi, the main regulation on fertilizers is the Law No. 1/5 of 12 March 2010 regulating the production and marketing of fertilizers and soil improvers in Burundi, and the main authority on fertilizer is the Department of Fertilizer within the Ministry of Environment, Agriculture and Livestock. There are two categories of crops under which fertilizer can be imported, namely fertilizers for farmer crops and fertilizers for cash crops. While Burundi's regulation establishes procedures for the importation of fertilizer, Burundi's system has significant regulatory gaps for fertilizer.

The government of Burundi has a subsidy programme in place for importation of fertilizer for farmer crops. The Ministry of Agriculture and Livestock advertises a call for tenders, the fertilizer companies place bids, and those that are successful are given licenses to import. Currently, there is a shortlist of companies that can import farmer crop fertilizers. In contrast, the importation of fertilizers for cash crops is an open process.

Once fertilizer reaches the borders, the Burundi Bureau of Standards testes it to assess compliance with quality standards. The government has not implemented regulations on

[23] Decree No. 100/55 in 2013 on PVP to grant and protect plant breeders' rights, Art. 39.
[24] Decree No. 100/55 in 2013 on PVP to grant and protect plant breeders' rights, Art. 41.

labelling and packaging of fertilizer, but the Burundi National Bureau of Standards is in the process of developing relevant standards. Currently, companies use paper labels showing the type of fertilizer and its ingredients.

During the September 2019 national validation meetings, government authorities stated that the structure of the subsidy programme would be changed in 2019. A local fertilizer production company has been contracted to supply subsidized fertilizer for farmer crops under a three-year contract. Fertilizer for cash crops will, however, continue to be imported since it is not under the subsidy programme.

The main challenge reported by importers revolves around difficulties accessing dollars for transacting and purchasing fertilizer from outside the country. However, government authorities have reported that access to dollars is not a challenge. since agriculture and access to fertilizer markets are priorities for the country. Another challenge is the underdevelopment of roads, and the high cost of transportation. It takes at least a week to get fertilizer from Dar es Salaam, and transport fees are expensive.

Because most fertilizers are imported through Burundi's subsidy programme and cannot be sold, the government has reported that there have not yet been cases of fake fertilizers. In addition, there are no companies producing fertilizers locally. Only one company (Fertilisants Organo-Mineraux-FOMI) has started blending fertilizers and intends to use agro-dealers to distribute fertilizers for food crops.

Stakeholders consulted have noted that a harmonized EAC Fertilizer Bill should consider issues of testing and standards applied in different EAC Partner States, capacity building, removal of border restrictions, and alignment of structures with COMESA.

Expected Impact (Costs) Accruing to Government of Burundi as a Result of EAC Harmonized Seed Bill

- Burundi does not have a complete regulatory system for seed and will need to address gaps in this regard, and, thus, costs associated with improving current regulations are expected to be incurred;
- Costs of equipping and upgrading the national seed testing laboratory;
- Facilitation of the national variety release committee to conduct regular variety release committee meetings;
- Strengthening of ISABU by employing and equipping breeders to develop more and better varieties for the key crops;
- Capacity building of local seed producers to produce and process certified seed;
- Enhanced quality control among seed producers, including consistent registration of seed producers and packaging of seed;

- Implementation of quarantine and non-quarantine pests lists as established by the EAC Seed Bill;
- Strengthening of agro-dealer networks by training and accreditation;
- Implementation of all laws and decrees related to the seed sector through strengthening ONCCS to perform its key functions including seed inspections (by hiring and training more seed inspectors, registration and monitoring of seed producers); and
- Possible costs if markets with more robust regulatory practices do not exercise mutual recognition.

Expected Impact (Benefits) Accruing to Government of Burundi as a Result of EAC Harmonized Seed Bill

- Small farmers will benefit from access to wider variety of quality seeds from the local market;
- Increased revenues from import duties, since companies from other EAC Partner States will be able to supply seed to Burundi with greater ease;
- Increased revenue from VAT and charges on variety release and certification processes with the expected increase in the number of seed breeders and producers as well as agro-dealers;
- Increased export earnings from increased varieties exported to the EAC Partner States; and
- Savings from reduced importation of seeds since with harmonization and improved functioning of the seed sector seed companies and producers can sufficiently produce for the local demand.

Expected Impact (Costs) Accruing to Government of Burundi as a Result of EAC Harmonized Fertilizer Bill

- Burundi does not yet have a comprehensive fertilizer regulatory system and would need to develop additional national measures; therefore, the government is expected to incur expenditures related to improving the regulatory system to meet the required standards of the harmonized Fertilizer Bill;
- Costs for capacity building in terms of training, accrediting, registering, and monitoring agro-dealers in charge of distribution of fertilizers;
- Increased expenditures in hiring and training more extension workers who are relevant in guiding farmers on proper agronomical practices in terms of fertilizer application;
- Costs of smallholder farmer sensitization and training on better farming practices using fertilizers in order to increase adoption (undertaken by the government in collaboration with fertilizer merchants and distributors);
- Capacity building to equip fertilizer testing laboratories with sufficient machines and relevant reagents as well qualified human resource (inspectors); and
- Facilitation of fertilizer companies to implement labelling and packaging requirements.

Expected Impact (Benefits) Accruing to Government of Burundi as a Result of EAC Harmonized Fertilizer Bill

- Harmonized testing and standards for fertilizer at the regional level would help increase availability of fertilizer in Burundi, which heavily relies on imports;
- Removal of border restrictions and alignment of structures with other regions should help facilitate regional trade, improve food security, and increase revenue to stakeholders;
- Increased revenues from import duties, since fertilizer companies from other EAC Partner States will be able to supply fertilizer to Burundi with greater ease; and
- With harmonization, agro-dealers in the fertilizer sub-sector are likely to increase, and, thus, the government is expected to generate revenues through local service tax imposed on these merchants as well as through registration fees that these dealers will pay to the government to obtain licenses.

Kenya's Regulatory Framework for Seed

Kenya's seed industry operates under a liberalized market economy. It has both formal and informal market systems, whereby the formal system is highly dominated by Kenya Seed Co., which represents roughly 70 percent of formal seed on the market. The private sector in Kenya consists of seed companies that deal in the production and marketing of certified seed as well as agro-dealers. Overall, the informal seed sector in Kenya accounts for roughly 72 percent of the total seeds produced locally, even though maize and rice are mainly supplied by the formal sector. The bulk of formal seeds are produced locally, and most seed imports to Kenya come from Southern African countries and Europe.

Kenya's seed regulatory system is relatively well developed. Several legal instruments regulate Kenya's seed sector, including: the Seed Policy (2010), which is under revision and aims to develop, promote, and regulate a modern and competitive seed industry through measures and government interventions to improve varieties, ensure quality control, and encourage high quality seeds;[25] the Seed and Plant Varieties Act Cap 326 of 2016, which comprehensively addresses all legislative issues relating to seeds and plant varieties, including PBRs, and seeks harmonization with other related acts and international agreements to which Kenya is a signatory; and the Crops Act 2013, which relates to growth and development of agricultural crops.[26] Kenya also has relevant accompanying regulations including: Seed and Plant Varieties (Seeds) Regulations (2016), which regulate procedures related to seed, including certification, inspection, processing, sampling and testing, among others;[27] Seed and Plant Varieties (Variety Evaluation and Release) Regulations (2016), which set out the procedure for application for variety evaluation and establish the National Performance Trials Committee and the National Variety Release Committee;[28] Seeds and Plant Varieties (Plant Breeder's Rights) (Trees and Woody Climbers Scheme) Regulations (2001), which set out the protection of PBR for trees and other plants;[29] and Seed and Plant Varieties (Plant Breeder's Rights) (Ornamental and Herbaceous Plants Scheme) Regulations (2001), which establish PBR for ornamental and herbaceous perennial plants.[30] Recent

[25] The Kenya National Seed Policy, 2010, Republic of Kenya, Ministry of Agriculture, http://www.asareca.org/PAAP/Policy%20Instruments/Kenya%20Seed%20Policy.pdf.
[26] The Crops Act, 2013, Kenya, http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/CropsAct2013No16of2013.PDF.
[27] The Seed and Plant Varieties (Seeds) Regulations, 2016, Kenya, https://www.wipo.int/edocs/lexdocs/laws/en/ke/ke011en.pdf.
[28] The Seed and Plant Varieties (Variety Evaluation and Release) Regulations, 2016, Kenya, https://infotradekenya.go.ke/media/Seeds%20and%20Plant%20Varieties%20Act%20Cap%20326%20-%20Legal%20Notice.pdf.
[29] Seeds and Plant Varieties (Plant Breeder's Rights) (Trees and Woody Climbers Scheme) Regulations Cap. 326, 2001, Kenya, http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/SeedsandPlantVarietiesActCap326.pdf.
[30] Seeds and Plant Varieties (Plant Breeder's Rights) (Ornamental and Herbaceous Plants Scheme) Regulations Cap. 326, 2001, Kenya, http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/SeedsandPlantVarietiesActCap326.pdf.

amendments to Kenya's Seeds Regulations include authorization of private seed inspectors, which is regarded as a good practice regionally and internationally.

Kenya's main regulatory authority for seed is the Kenya Plant Health Inspectorate Service (KEPHIS), which is the designed NSA and oversees the processes of variety release and registration and certification of varieties. KEPHIS performs a central role in variety release and registration, certification, and cross border trade to ensure plant health and quality of agricultural inputs for competitive agriculture and sustainable development. In addition to KEPHIS, the Ministry of Agriculture, Livestock and Fisheries is also involved in the regulation of the seed system. The Ministry is the legal authority in charge of formulating, implementing, and monitoring agricultural acts, regulations, and policies that support agricultural research, promote technology, ensure quality of seeds and other inputs, and control pests. The Ministry also has the final approval on varieties released to market. There is an established seed trade association, the Kenya Seed Trade Organization (STAK), with membership from both the private and the public sectors.

Public institutions including the Kenya Agriculture and Livestock Research Organization (KALRO), public universities, international research centres, and private seed companies develop varieties through various breeding activities. The multiplication of early generation seed, pre-basic, and basic seed is mostly done by public institutions, depending upon their capacity and adequacy of resources.[31] The legal and regulatory framework governs production and multiplication activities done by both public and the private institutions. Stakeholders highlighted that timeliness and availability of adequate early generation seed is a challenge to producing improved seed.

Kenya requires that new varieties undergo a minimum of two seasons of testing for DUS and VCU, or NPTs, before entry into the National Variety Catalogue. Once a variety enters the National Variety Catalogue, it can be freely traded within Kenya's territory. Exceptions can be made on the grounds of food security, national interest, or because a variety has been released in two countries within an economic bloc of which Kenya is a member and which has harmonized regional plant variety release regulations and procedures. On average, the variety release process in Kenya has a duration of 36 months. The overall charges for DUS and NPTs reportedly amount to around $3,000 USD plus inspection fees paid to inspectors travelling to the farms, which amount to $ 0.335 USD per kilometer.

A plant variety that has already been officially released in any country within a regional bloc of which Kenya is a member must only undergo one season of VCU or NPT in similar agro-ecological zones, and a plant variety that has been officially released in at least two countries within a regional bloc of which Kenya is a member may apply for an exemption from NPT (under the EAC Seed Bill, such a variety may undergo automatic release in another EAC Partner State with similar agro-ecological zones if the data used to release the plant variety is made available and verified by the EAC Seed Office). These exemptions only apply if the country in which the registration was done has harmonized its variety release regulations and procedures with the harmonized regional variety regulations and procedures and the

[31] Katrin Kuhlmann and Yuan Zhou, "Seed Policy Harmonization in the EAC and COMESA: The Case of Kenya," NML and Syngenta Foundation for Sustainable Agriculture, September 2015.

applicant provides the data leading to release of the variety in the first country. This will facilitate implementation of the EAC Seed Bill and is also aligned with the COMESA Seed Trade Regulations, although it may present a hurdle for countries within the region that do not yet have fully functioning variety release regulations and procedures.

In the variety release and registration process, KEPHIS receives applications, oversees variety testing trials, collects data from trials, submits reports and test data to the National Performance Trial Committee (NPTC), and convenes these meetings. The NPTC reviews applications for variety release and registration, evaluates the performance trials report presented by KEPHIS, informs applicants of the outcome of their performance trials entries, and recommends to the NVRC the varieties that qualify to be released, pre-released, or rejected. The NVRC considers the performance trials report and the NPTC report and issues recommendations to the Cabinet Secretary for grant of exemption if recommended by the NVRC and NPTC. The NVRC is mandated to sit at least once a year, but, in practice, it typically sits more than once. If a company needs to have its varieties promptly reviewed, it can sponsor an NVRC meeting. The NVRC is chaired by the KEPHIS Managing Director and is comprised of actors from the seed industry in Kenya from both the public and private sectors, with representatives from STAK, the National Association of Plant Breeders (NAPB), the Agricultural Advisory Services Division of the state department responsible for agriculture, the Governor's Council, universities, the Kenya National Agricultural Farmer's Federation, and other crop specialists.

For seed certification, KEPHIS certifies qualifying seed, provides labels to seed companies, and licenses agro-dealers and seed merchants. KEPHIS is mandated to ensure quality assurance standards and inspections, both at the field level and during seed processing, in accordance with the Seed Regulations and OECD Seed Schemes. Under Kenya's 2016 Seed Regulations, KEPHIS can authorize private sector seed inspectors; however, KEPHIS has so far reportedly held only two private sector inspector trainings and commissioned only a few inspectors.

Under Kenya's seed certification process, laboratory tests are conducted in accordance with ISTA standards and rules. Kenya's 2016 regulations provide for six classes of seed: breeder, pre-basic, basic, certified first generation, certified second generation, and standard seed. The first three seed classes cover foundation seed, and the latter are commercialized seed.

Companies consulted have reported that issues remain with seed certification, where the costs of inspection are high. Certification is required in order for seed to be sold commercially, yet KEPHIS still does not have enough inspectors. Reportedly, the training of private seed inspectors by KEPHIS is prohibitively expensive, and companies consulted stressed that trained private inspectors have yet been fully allowed to conduct inspections, because most companies do not have laboratories that meet the required standards. In general, it has been reported that the private inspectors are present at different levels within companies. Additionally, it has been reported that a few companies have been licensed to conduct field inspections. The certification standards are also viewed as stringent and not reflective of the reality of the country. While KEPHIS is already tasked with functions equivalent to those required by the EAC Seed Bill for certification, testing and labelling procedures, capacity challenges should be addressed.

To address counterfeit seed, Kenya has developed a scratch-off system which allows companies to use labels created by KEPHIS that have barcodes that the buyer can scratch off and use to verify whether seed is fake or not. Although challenges were reported at the beginning of the initiative, the process seems to be more streamlined now. Companies have reported that the scratch-off labels add a cost that is further transferred to farmers, while government stakeholders have stated that the cost of the scratch-off label is minimal in comparison with the protection it offers.

KEPHIS has the mandate to issue import and export permits and phytosanitary certificates. KEPHIS also controls seed merchant's registration, which is required for the importation and exportation of seeds, and issues import and export permits in compliance with the Seed Regulations.

To ensure plant health and safety, KEPHIS has officers and inspectors at points of entry and exit. An ISTA orange certificate and a phytosanitary certificate must accompany imported seed. The seed is subjected to laboratory analysis tests upon importation. On average, it takes an importing seed company seven days to import seed into Kenya, and ten days to export seed. This is relatively efficient compared with other countries in the region and will probably mean that Kenya's importers and exporters will benefit relatively more from harmonization at the EAC level.

Kenya has adopted a pest list, although it is outdated and includes pests that are no longer present in the region, which creates a challenge for cross-border trade. Stakeholders have also reported that Kenya's lack of trust in other countries' pest lists poses an additional hurdle. The EAC Seed Bill requires that Partner States conduct border post controls, adopt pest risk analysis procedures according to international standards, maintain and update national quarantine and non-quarantine pest lists for seed, and adopt the EAC quarantine and regulated non-quarantine pest lists for seed. While Kenya complies with the first two requirements, it would need to update its pest lists and adopt the EAC's quarantine and non-quarantine pest lists.

Kenya adopted the Seeds and Plant Varieties (Plant Breeder's Rights) Regulation, subsidiary regulation of the Seeds Act (Cap 326), in 2015, to grant and protect plant breeders' rights. This regulation is based on UPOV 1991, with which Kenya is compliant. Depending upon the crop, PVP protection in Kenya lasts between 20 and 25 years. KEPHIS is the recognized institutional authority for enforcing plant breeder's rights under the Seeds Act.

Seed companies in Kenya will both benefit and face costs from harmonization. Mainly, given the costs associated with developing, releasing, registering, certifying, and producing seed, among others, farmers in Kenya might opt to purchase cheaper seeds from neighboring countries where seed companies have less cumbersome requirements and lower costs for seed production. This would imply that local seed companies may face strong competition from neighboring countries like Uganda and Tanzania.

Smallholder farmers are likely to benefit from a wider variety of quality seeds from the local market, since the seed system is very functional. Similarly, the scratch-off labeling and voucher system in Kenya is helping farmers access quality seeds and allows them to immediately verify their authenticity. This will improve their farm yields. Increasing farmer

awareness through public and private campaigns will increase farmer's knowledge on the benefits of using improved seed and will also improve farm yields. However, these benefits may not flow without some short-term increases in the price of the seed, since the labelling, scratch-off cards, and packing require costs that will be incurred by the seed companies and shifted to the final consumer (the farmer) through seed prices.

Overall, Kenya has in place most of the institutions and functions necessary for the implementation of the EAC Seed Bill. As Kenya's NSA, KEPHIS administers and manages variety evaluation, release, and registration; oversees data collection and analysis; appoints inspectors, analysts, and samplers; carries out seed certification; and issues certificates for seed lots tested, import and export permits, seals, and labels. Overall, Kenya's system should be able to support the majority of obligations called for under the EAC Seed Bill; however, the scope of some institutions may need to be broadened to specifically incorporate EAC regional processes, and Kenya would need to ensure that KEPHIS maintains the National Variety Catalogue and notifies the EAC Seed Office of new varieties and withdrawals; KEPHIS would also be expected to issue certificates for regional trade in liaison with the NPPO, provide regional seals and labels to seed producers, and provide training for the implementation of the EAC Seed Bill at the national level.

The EAC Seed Bill includes the protection of Plant Breeders Rights, based on UPOV. In particular, the EAC Seed Bill takes vocabulary and procedures from UPOV 1991. Harmonization of PBR and PVP under the EAC Seed Bill could help to preserve rights on protected varieties, expand knowledge on PBR and PVP, and render protection more enforceable. With respect to Kenya's system, it would seem that implementation of the EAC Seed Bill should not cause major challenges in Kenya.

Kenya's Regulatory Framework for Fertilizer

Fertilizers in Kenya are regulated under the Fertilizer and Animal Foodstuffs Act, Cap 345, and various rules on approved fertilizers, analysis, sampling, declaration of warranty, and packaging. The Fertilizer and Animal Food Stuffs Act was amended in 2015 to create the Fertilizer Board of Kenya, with a mandate of regulating the fertilizer industry, including overseeing the subsidy programme, managing importation and distribution of fertilizer, and overseeing licensing of dealers, among other functions. The Fertilizer Board is being operationalized, and at the moment the Veterinary Services Board still regulates the fertilizer industry.

Kenya's current regulations establish rules on analysis, sampling, packing, declaration of warranty, and records and returns. KEPHIS is mandated to guarantee fertilizer quality by setting up laboratories and issuing reports. While there are no regulations on registration of new fertilizers, issuing of permits or licenses to fertilizer dealers, or storage, use, or disposal of fertilizer, there is a system in practice. The Kenya Bureau of Standards (KEBS) monitors, inspects, and enforces standards. For new fertilizers, KEBS's technical committee sets out the standards, and the fertilizer can then be registered based on those standards, with testing done in KEPHIS labs. Conventional fertilizers are not required to be registered.

Kenya's major requirement for importation relates to testing and analysis of fertilizer to check to see whether it meets the standards set by KEBS. For new fertilizer, the technical

committee on fertilizer under KEBS, composed of stakeholders from the fertilizer industry, sits to set standards. Samples of the imported fertilizer are taken by authorized inspectors in accordance with the Fertilizer and Animal FoodStuffs (Samples) Regulations and analyzed in accordance with the Fertilizer and Animal FoodStuffs (Analysis) Rules. After analysis, the importer may be issued an analysis certificate in the form prescribed in the rules.

Private sector stakeholders mentioned that the regulation of Fertilizer and Animal FoodStuffs under the same act is improper, as the two are very distinct. Further, the absence of requirements on who can trade in the industry has led to the increased sale of fake fertilizers. There is also a fertilizer subsidy programme which has reportedly distorted the market and diverted fertilizer from the intended beneficiaries. Kenya's regulations require that importers of subsidized fertilizers to go through a bulk procurement process. There have been instances in which some of the fertilizer under the subsidy programme has been fraudulently repackaged and sold on the market or even exported to nearby countries. Companies also believe that the subsidy programme is not financially sustainable, and the need to restructure the programme has been raised.

Expected Impact (Costs) Accruing to Government of Kenya as a Result of EAC Harmonized Seed Bill

- Increasing the number of authorized and trained inspectors, including through implementation of the amended Seed Regulations which authorize private seed inspectors, so that the seed certification process will be more efficient and the supply of seed will be able to meet the potential demand in the region;
- Streamlining the variety release process, which reportedly remains long, costly, and bureaucratic;
- Updating pests lists and implementing quarantine and non-quarantine pests lists as established by the EAC Seed Bill;
- Increasing the availability of extension services to smallholder farmers to enhance their knowledge on the use of improved seed varieties; and
- Possible relocation of seed companies and breeders to other Partner States for production and breeding, since the process of variety release and certification is reported to be lengthy and costly for private companies; if unaddressed, this could lead to a reduction in expected revenues from harmonization.

Expected Impact (Benefits) Accruing to Government of Kenya as a Result of EAC Harmonized Seed Bill

- Benefit to small farmers due to access to a wider variety of quality seeds in the local market;
- Increased revenues from import duties, since companies from other EAC Partner States will be able to supply seed to Kenya with greater ease;

- Increased export earnings from increased varieties exported to EAC Partner States; and
- Increased revenue from VAT and charges on variety release and certification processes with an expected increase in the number of seed breeders, producers, and agro-dealers.

Expected Impact (Costs) Accruing to Government of Kenya as a Result of EAC Harmonized Fertilizer Bill

- Kenya does not yet have a complete fertilizer regulatory system and would need to develop additional national measures; this will require some government expenditures, including those associated with implementation;
- Streamlining operations of fertilizer agro-dealers will require the government (through KEPHIS) to spend more on training, registering, and accrediting fertilizer agro-dealers in Kenya. This is due to the fact that even though Kenya has an online fertilizer catalogue, this catalogue has some gaps, particularly due to the lack of registration of fertilizer dealers;
- More expenditure is needed in hiring qualified inspectors and equipping fertilizer testing laboratories in Kenya;
- Stakeholders have reported that more soil analysis is necessary to understand which fertilizers are needed in Kenya. Currently there is no technical capacity to conduct such tests, and laboratories operated by the private sector, KALRO, and KEPHIS are not sufficient or properly equipped. The same weakness has been reported for fertilizer quality testing, even when there are other public laboratories in this area;
- Investment in infrastructure for fertilizer testing laboratories to equip them with sufficient machines and relevant human resources (inspectors); and
- Capacity building will be particularly needed in the areas of monitoring and enforcement.

Expected Impact (Benefits) Accruing to Government of Kenya as a Result of EAC Harmonized Fertilizer Bill

- Harmonization of fertilizers could overcome some of the challenges noted by stakeholders by establishing a common system, building capacity, streamlining procedures, and sharing information among EAC Partner States;
- With harmonization, agro-dealers in the fertilizer sub-sector are likely to increase, thus generating revenue through local service tax imposed on these merchants as well as through registration fees that dealers will pay to the government for licenses;

- Harmonized testing and standards for fertilizer at the regional level would also help increase availability of fertilizer to smallholder farmers; and
- Removal of border restrictions and alignment of structures with other regions (e.g. with COMESA) should help facilitate regional trade, improve food security, and increased revenue to stakeholders.

Uganda Regulatory Snapshot and Cost-Benefit Assessment

Uganda's Regulatory Framework for Seed

Like Kenya, Uganda operates a liberalized seed market economy with both formal and informal seed production and supply systems. Under the Ugandan seed system, the government is responsible for developing research capacity, while the private sector carries out production, processing and marketing of seed.

Uganda's regulatory framework for seeds is comprised of several legal instruments that regulate the different processes along the seed value chain. Uganda's main legal instrument regulating the seed sector is the Seed and Plant Act of 2006, which is accompanied by the Seed Regulations of 2017, which sets out the procedural guidelines on implementation of the Act. Other key legal instruments include the National Seed Policy of 2018, National Agricultural Research Systems Act (2005), Plant Protection and Health Act of 2015, and Plant Variety Protection Act of 2014. Uganda's new National Seed Policy designates a new seed regulatory authority called the Uganda Plant Health and Inspectorate Agency (UPHIA).

The Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), through its Directorate of Inspection and Certification, is the official focal point mandated with regulating the seed industry, with NSCS, created under section 8 of the Seed and Plant Act, 2006, responsible for overseeing variety release and registration and certification of seed. Public institutions under the National Agricultural Research Organization (NARO) are the main source of basic seed. According to seed companies, investment in public breeding is mainly concentrated in a few crops, namely, maize, millet, and sorghum.

Uganda's regulations require that variety undergo testing for two seasons of DUS in accordance with UPOV guidelines and two seasons of NPT, conducted in at least four agro-ecological zones, before entry into the National Variety List and Common Catalogue. Uganda's regulations are harmonized with COMESA, but, in practice, one season of NPT is always required even when the variety is registered in two other countries.

NSCS has the mandate to conduct all variety testing and register varieties on the National Variety List and the Common Catalogue following release. NSCS works with NVRC, established under section 6 of the Seed and Plant Act, which is obliged to review and maintain the National Variety List, approve new varieties, and approve entry into the seed

multiplication program.[32] The NVRC members consists of a pathologist, three breeders, a seed technologist, a socio-economist, an agronomist, a representative of the Commodity Association, an agricultural extension worker, an entomologist, a weed scientist, and a forest breeder.[33] The NVRC regulates its own procedures and sets its own guidelines for variety release and registration;[34] it may add additional members as it determines, and meets at least twice each year.[35] The final administrative body in the variety release process is the National Seed Board, created under section 3 of the Seed and Plant Act, 2006, which publishes the National Variety List in the Gazette.

Overall, the variety release process in Uganda is reported to take 28 months. The official cost for DUS test is 350,000 Ugandan Shillings (Ug Shs) or USD 100 per variety, and VCU testing costs approximately 800,000 Ug Shs or USD 225 per variety. The variety registration fee is Ug Shs 100,000, or approximately USD 35.[36] In practice however, breeders and producers of seed incur extra costs causing the overall process to cost between USD 1,200 and USD 5,000 (including transport and living costs for the staff who run the on-farm trials, site management, crop assessments, and evaluation). NARO has been adjusting fees to reflect actual costs.

Field consultations indicated that capacity constraints impact the process for variety release and registration and create overlap and possible confusion with regard to testing. Some stakeholders reported that NARO used to perform DUS and VCU testing, because it had the capacity to do so, in contrast to NSCS, but NSCS has now taken back this function, while others reported that NARO is still doing testing. During national validation meetings, government authorities clarified that DUS tests are conducted by NSCS independently, while NPT is conducted jointly with NARO.

NSCS is mandated with conducting field inspection, testing, labeling, sealing, and certification in accordance with the seed regulations and OECD standards. Under the 2017 Seed Regulations, NSCS can authorize and accredit the private sector to participate in conducting field inspections, laboratory seed testing, seed sampling and seed labeling, where such private sector actor meets the qualifications in the regulations. However, the seed certification service has not accredited any private sector actors yet. NSCS reportedly has only 7 seed inspectors and three working vehicles, which are usually out of fuel, and its laboratory is under-equipped.

The 2017 Seed regulations provide for six classes of seed: breeder, pre- basic, basic, certified first generation, certified second generation, standard seed, and QDS. The first three seed classes cover foundation seed, and the latter are commercialized seed. The Ugandan seed classifications are a bit different than COMESA's and seed classes proposed under the EAC Seed Bill. Under the COMESA Seed Trade Regulations and the EAC Seed Bill, four seed classes

[32] Section 7 of the Seed and Plant Act, Uganda.

[33] Section 6(2) of the Seed and Plant Act, Uganda.

[34] Regulation 10(1) of the Seed and Plant Regulations, Uganda.

[35] Section 6(6) of the Seed and Plant Act, Uganda.

[36] Schedule 4 of the Seed and Plant Regulations, Uganda.

are recognized, that is, pre-basic, basic, first generation certified, and second-generation certified seed. Both the EAC and COMESA do not recognize breeder seed and QDS as certified seed classes.

Under Uganda's certification process, laboratory tests should be conducted in accordance with ISTA; however, as a result of capacity and resource inadequacies, Uganda lost its membership in ISTA. Currently, there is only one private laboratory with ISTA accreditation, Chemiphar (U) Ltd, which is expensive and cannot alone meet demand for services. The Ministry of Agriculture is currently in the process of regaining ISTA membership and building capacity of inspectors.

Counterfeit seed is another major challenge in Uganda's seed industry. Intervention from the Ministry of Agriculture, in form of inspection of agro-dealer shops, only happens when violations are reported by customers. NSCS issues labels to companies, but there have been cases where these labels have been falsified. NSCS is considering introducing a scratch card system, similar to what Kenya has, but this is currently only at the consultation level.

The EAC Seed Bill establishes a certification process for seeds to be traded within the region. In this sense, it requires that Partner States designate official testing laboratories, and issue certificates, labels, and seals. If Uganda were to regain ISTA membership and follow its standards, along with OECD Seed Schemes, its certification system could be compatible with EAC Seed Bill, assuming resource constraints and counterfeiting could be addressed.

The Ugandan government also regulates the licensing and oversight of seed merchant activities. Local seed companies have basic and certified seed production activities on-farm or with seed growers. Major seed selling outlets are facilitated by the government, agro-dealer distribution networks, and non-governmental organizations operating in the region.

NSCS is responsible for issuing import and export permits to the seed merchants. Maize is the top food seed import, with over 967 metric tons imported in 2017. Most seed comes from Kenya and Zimbabwe. It takes 15 days on average to import seed into Uganda. Similarly, maize is also the top export seed from Uganda, with over 1,305 metric tons exported in 2017, much of which is destined for South Sudan, Burundi, Tanzania, Kenya, and DR Congo. On average, it takes 15 days to export seed from Uganda.

Uganda's regulations require that registered seed merchants apply to NSCS for permits to import seed. Imports must be accompanied with an orange ISTA certificate and a phytosanitary certificate in accordance with the Plant Health Protection Act of 2015. Once imported, seed is tested to assess whether it meets appropriate standards. Uganda has adopted a pest list, although it is outdated, which creates a challenge to cross border trade.

To ensure plant health and safety, NSCS has officers and inspectors at points of entry and exit. Consultations with stakeholders revealed issues such as capacity gaps, too few inspectors and vehicles, and no laboratories at the border.

Harmonization under the EAC Seed Bill will rely upon implementation of good practices by the Partner States, such as conducting border post controls, adopting pest risk analysis procedures according to international standards, maintaining and updating national

quarantine and non-quarantine pest lists for seed, and adopting the EAC quarantine and regulated non-quarantine pest lists for seed. In this sense, Uganda would first need to update its pest list. Secondly, while Uganda has a system to conduct border post control, in place, it is clear from stakeholder consultations that the system is currently inefficient. The EAC Seed Bill could help streamline and simplify some of the border controls, which could facilitate cross border trade.

Uganda has adopted the Plant Variety Protection Act 2014, which provides for PBR and PVP. The Act establishes the Plant Variety Protection office in the Ministry of Agriculture, with a registrar with the mandate to receive and examine applications for the registration of PBRs, assign the testing of the variety to the seed certification unit or another relevant body, publish applications of PBRs in the gazette, publish objections against an application and conduct hearings on objections, and register and issue certificates for PBR. While stakeholders consulted stated that the PVP Act was based on provisions of UPOV and ARIPO, its provisions are slightly different, as it preserves farmer's privilege to use saved seed and traditional varieties, similar to Burundi's system. However, during national validation meetings, it was reported that PVP and PBR should be regulated outside of the current Seed Bill, to include protection of indigenous varieties, since 95 percent of seeds in Uganda are either home-saved or developed from local materials.

The main challenge with PVP in Uganda is that that there are no regulations under the PVP Act, meaning that it cannot be operationalized. Implementation and operationalization of the PVP Act could allow Uganda to be more competitive within the EAC.

The EAC Seed Bill includes the protection of Plant Breeders Rights, based on UPOV. In particular, the EAC Seed Bill takes vocabulary and procedures from UPOV 1991. Harmonization of PBR and PVP under the EAC Seed Bill could help to preserve rights on protected varieties, expand knowledge on PBR and PVP, and render protection more enforceable. "Farmer's privilege", a common practice among smallholder farmers of saving a portion of seed each season to either use it in future season or exchange it with other neighboring farmers,[37] is allowed under the EAC Seed Bill to an extent. Under UPOV 1991 this practice is allowed if members provide for it in domestic law and regulation. In its implementation, the EAC Seed Bill should be applied with the understanding that propagation allows saving seed for future use and exchange between farmers. This practice is considered important to stakeholders and would need to be addressed. Allowing for this privilege to continue would help facilitate the implementation process.

Generally, with respect to the EAC Seed Bill requirements, Uganda has in place most of the institutions and functions necessary for the implementation of the bill. NSCS is Uganda's NSA, and its functions are similar to those required by the EAC Seed Bill. The NVRC also has functions equivalent to those required by the EAC Seed Bill, since it sets the guidelines for variety release and registration, evaluates relevant data, reviews applications, and approves the release of new varieties. Since these institutions are established under national legislation, Uganda may need to broaden the scope of rules and regulations to include regional variety registration and other procedures. In particular, Uganda would have to

[37] Decree No. 100/55 in 2013 on PVP to grant and protect plant breeders' rights, Art. 41.

include a regulatory provision allowing for a streamlined regional variety release procedure, similar to the provision in Kenya's rules, when a variety has been released in one or two Partner States. Even though Uganda's regulations are harmonized with the COMESA Seed Trade Regulations, in practice one season of NPT is still required even when a variety has been registered in two countries; this practice is also out of step with the EAC Seed Bill. Also, Uganda would need to designate the authority with the mandate to maintain and update the National Variety Catalogue and notify the EAC Seed and Plant Variety Committee of new varieties and withdrawals. Furthermore, Uganda should determine which authority would be in charge of providing regional seals and labels to seed producers and provide training for the implementation of the EAC Seed Bill at the national level.

Seed companies in Uganda will both benefit from and face costs as a result of harmonization. Mainly, given the time it takes for the release of a variety and the costs associated with it, Ugandan farmers might opt to purchase cheaper seeds from neighboring countries where seed companies have less cumbersome requirements and lower costs for seed production. This implies that local seed companies may face strong competition from neighboring countries. However, Uganda's seed producers may also be able to compete against seed companies from other countries with long and complicated seed regulatory procedures, since cost for developing and breeding varieties in these countries may be high in comparison to Uganda.

While from an institutional and regulatory point of view, Uganda seems to have all of the institutions required by the EAC Seed Bill, its resources constraints are a major challenge. Indeed, the fact that national authorities are not able to perform their functions under the national regulations poses the question of whether the implementation of the EAC Seed Bill would entail more challenges. However, harmonization could also help to simplify these procedures and render them more efficient.

Uganda's Regulatory Framework for Fertilizer

The fertilizer industry in Uganda is regulated under the National Fertilizer Policy of 2016 and the Agricultural Chemicals (Control) Act of 2007. The Fertilizer Policy aims to strengthen the capacity of farmers to engage in safe, profitable, and sustainable fertilizer use, while the Agro Chemicals Control Act regulates the manufacture, quality, storage, and trade of fertilizer in Uganda. The regulatory framework of fertilizers involves the verification of fertilizers at importation, testing of fertilizer, and issuance of import and export permits. The main challenge with the Agro Chemicals Control Act, however, is that regulations are needed to operationalize it and have been in draft form since 2012. The draft regulations provide a procedural framework governing fertilizer standards, packaging and labelling requirements, storage and safe use, import and export requirements, and registration requirements of product, premises, dealers, and manufacturers of fertilizers. The draft regulations are currently with the Solicitor General for recommendation to the Minister of Agriculture, Animal Industry and Fisheries for approval.

The Agro Chemicals Board, established under the Agro Chemicals Control Act, is the main regulatory body for fertilizer in Uganda, with the authority to conduct registration of fertilizers, premises where fertilizer is sold or stored, and dealers and manufacturers of fertilizer. The Agro Chemicals board is also mandated with checking the quality of all

fertilizers, whether imported or domestically produced and has the mandate to issue fertilizer import and export licenses. However, due to the lack of regulations to guide the Board's activities, the processes for licensing, registration, and issuance of import and export permits are neither clear nor streamlined. Additionally, companies have reported limited comprehension of the applicable procedures.

Currently, the Uganda National Bureau of Standards (UNBS) inspects all imports, including fertilizers, and requires that testing is done in the country of origin with a PVoC attached for fertilizer of FOB above USD 2000.[38] There are three authorized service providers of PVoC. If the fertilizer is imported without a PVoC, the UNBS inspectors take a sample and do the testing at the UNBS laboratory. The service providers set the costs, so UNBS doesn't know how much it costs and how long the testing will take. At UNBS, testing takes a minimum of 35 days. There is a first in-first-out process, but the testing process takes a lot of time due to the large number of samples, inadequate staffing, and limited equipment. UNBS only looks for substandard goods and not counterfeits, while checking counterfeits is the mandate of Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). UNBS only has a very small team on the ground (7 inspectors). Fertilizers from EAC countries with a mutually-agreed quality mark are inspected at the border and are exempted from PVoC and further testing at destination. There are mini laboratories at OSBP borders, which were meant to do quick tests and reduce the backlog at the main lab in Kampala, but they are not yet active. Additionally, inspectors are also very few at the borders.

Expected Impact (Costs) Accruing to Government of Uganda as a Result of EAC Harmonized Seed Bill

With respect to the EAC Seed Bill, Uganda is in a good position, since harmonization with the other EAC Partner States will likely expand Uganda's regional market share of seed exports. However, the government will need to make the following investments to fully comply with the requirements of the harmonized seed bill:

- Capacity building for NSCS and NARO, which suffer from limited resources, with an impact on functions including variety release, field inspection, and seed production supervision;
- Implementation of quarantine and non-quarantine pests lists as established by the EAC Seed Bill;
- Uganda will need to train, accredit, and deploy more field inspectors to effectively meet the demands of seed breeders and producers. Currently the country has only 7 seed inspectors, which is insufficient to meet present and future demand. The approximate cost to train new seed inspectors is around USD 500 per person, which is also the average cost to train seed inspectors in Kenya. This can also be linked with

[38] The Uganda National Bureau of Standards (Inspection and Clearance of Imports) Regulations, SI No. 26 of 2018.

implementation of the amended Seed Regulations, which authorizes private seed inspectors;

- MAAIF needs to move forward with the process for reinstating ISTA accreditation for the national seed laboratories. This will involve government expenses, including the procurement of specialized equipment, hiring of more laboratory staff, and requisite costs for accreditation;
- Uganda recently drafted a national seed policy that designates a new seed regulatory authority. According to the new policy the Directorate of Crop Inspection and certification will become a semi-autonomous agency called "Uganda Plant Health and Inspectorate Agency" (UPHIA). This agency will oversee all plant health services, seed regulatory services, and agricultural and plant related chemical regulatory services. This policy is yet to be passed by the cabinet; however, operationalizing this new seed regulatory entity will be important for implementation of the EAC Seed Bill and thus is a cost that the Ugandan government needs to anticipate;
- PBR protection in Uganda is regulated and based on UPOV but needs to be operationalized to ensure transparent protection to PBRs. The adoption of the EAC Seed Bill could help in this sense; and
- To ensure awareness and knowledge of improved seed by farmers, the government needs to invest in awareness campaigns, including those that target anti-counterfeiting practices. In general, farmers in Uganda have limited knowledge of agronomic practices, due to a limited number of extension workers. Currently, information from 2014 indicates that the ratio of extension workers to farmers stands at 1:5,000. However, the government plans to train and accredit over 1,000 agro-dealers, which also implies increased expenses for training and hiring extension workers and training agro-dealers as well. [39]

Nevertheless, all these investments will likely benefit Uganda in the long run. Uganda will likely receive increased revenues from export and import of seed in the region.

Expected Impact (Benefits) Accruing to Government of Uganda as a Result of EAC Harmonized Seed Bill

- Small farmers will benefit from access to a wider variety of quality seeds from the local market;
- Increased sales revenues for farmers, resulting from projected sales to South Sudan, Rwanda, and Burundi, as a consequence of the elimination of trade barriers;

[39] MAAIF (2014) *Uganda National Agricultural Extension Strategy*. Entebbe.

- Reduction of costs for seed certification for farmers, as a consequence of the reaccreditation of the national seed laboratory;
- Increased demand for improved seeds from farmers;
- Increased tax revenues from increased exportation of seed to EAC Partner States;
- Increased revenues from import duties; and
- Increased export earnings from increased varieties exported to the EAC Partner States.

Expected Impact (Costs) Accruing to Government of Uganda as a Result of EAC Harmonized Fertilizer Bill

- Cost associated with drafting, passing, and implementing fertilizer regulations, as, currently, Uganda does not have a complete fertilizer regulatory system and would need to develop additional national measures (including regulations to operationalize the system);
- Equipment and inspectors are insufficient, thus government would be required to ensure proper functioning of the fertilizer sub-sector in the country as proposed by the bill;
- More soil analysis is needed to understand which fertilizers are needed in Uganda, and technical capacity to conduct such tests is lacking;
- Capacity building is particularly needed in the areas of fertilizer adoption and use by smallholder farmers, government monitoring and enforcement; and
- Possible costs if markets with more robust regulatory practices do not exercise mutual recognition.

Expected Impact (Benefits) Accruing to Government of Uganda as a Result of EAC Harmonized Fertilizer Bill

- Harmonization of fertilizers could overcome some of the challenges noted by stakeholders by establishing a common system, building capacity, streamlining procedures, and sharing information among EAC Partner States. This will result in improved trade among partner states, and, thus, revenues are expected to increase;
- With harmonization, the number of agro-dealers in the fertilizer sub-sector is likely to increase, and, thus, the government is expected to generate revenues through local service tax imposed on these merchants as well as through registration fees that dealers pay to obtain licenses;

- Harmonized testing and standards for fertilizer at the regional level would also help increase availability of fertilizer to smallholder famers, and, thus, production and productivity are anticipated to increase; and
- Removal of border restrictions and alignment of structures with other regions should help facilitate regional trade, improve food security, and increased revenue to stakeholders.

Tanzania Regulatory Snapshot and Cost-Benefit Assessment

Tanzania's Regulatory System for Seed

Similar to Kenya and Uganda, Tanzania's seed industry is operating under a liberalized market economy. Currently, there are more than 100 private seed companies operating in Tanzania, which, alongside the public sector, are involved in variety development, seed production, processing, marketing, exporting, and importing of seeds.

Tanzania's market consists of both mainland Tanzania (Tanganyika) and Zanzibar, which currently have the same legal instruments and challenges. However, Zanzibar is reportedly working on a draft Seed Law which would establish a different regulatory body for seed, called the Seed Control Authority of Zanzibar, and will not require registration of vegetable varieties. For purposes of this assessment, the currently regulatory system will be described with any differences noted.

Tanzania's regulatory framework for seeds is relatively well developed and is comprised of several legal instruments that regulate the different processes along the seed value chain. Seed and fertilizer policy directions have been established in the National Agricultural Policy, which was adopted in 2013.[40] Tanzania's main laws regulating the seed industry are: Seed Act of 2003 (as amended in 2014), which establishes several institutional bodies, including the National Seed Committee and the Seed Certification Institute, and provides for conditions for export, import and trade in seeds, registration of dealers, and penalties for violation of the provisions of the Act;[41] the Seed (Amendment) Regulations of 2017, which operationalizes the Seed Act by providing procedural guidelines on implementation of the Act, including processes on seed dealer registration, variety release and registration, seed testing and sampling, certification, importation and exportation, and penalties for noncompliance.[42] Tanzania also has other relevant laws and regulations including: the 2012 Plant Breeder's Rights Act and the Protection of New Plant Varieties (Plant Breeders' Rights) Regulations of 2018, which provide for breeders' intellectual property rights; and the 1997 Plant Protection Act and 1999 Plant Protection Regulations, which ensure the plant heath of imported and exported seeds.

Tanzania's main regulatory authority is the Tanzania Official Seed Certification Institute (TOSCI), a semi-autonomous government agency established under the Seed Act which falls

[40] National Agriculture Policy, Ministry of Agriculture, Food Security, and Cooperatives, Dar es Salaam, 2013.
[41] The Seed Act, 2003, Tanzania.
[42] The Seed Regulations, 2017, Tanzania.

under the Ministry of Agriculture, Food Security, and Cooperatives and oversees the processes of variety release and registration and seed certification. Public agricultural research institutes and international research institutes engage in public breeding in Tanzania. The Agricultural Seed Agency (ASA), within the Ministry of Agriculture, Food Security and Cooperatives, sells pre-basic seed developed by the public research institutions to private companies for the production of certified seeds to be sold to farmers.[43] Private companies can also produce foundation seed using public varieties through licenses granted by the Agricultural Research Institutes.[44]

Tanzania requires that new varieties undergo a minimum of two seasons of testing for DUS and one season of NPT before they can be entered into the National Variety Catalogue. The application for NPT must include a proof of a minimum of two recent previous seasons of advanced yield trial data from not less than three recognized testing sites or from any country with which with Tanzania has a harmonized seed regulatory agreement (i.e. any SADC Member State). The NPT test is conducted by TOSCI for at least one season on at least three scheduled sites.[45] The applicant, however, has to provide two seasons of advance yield trial data collected prior to making the application. On average, it reportedly takes 36 months to release a new seed variety in Tanzania.[46]

A plant variety that has undergone DUS tests by a recognized authority or organization in any country with which Tanzania has an agreement on seed regulations or quality control may be exempt from DUS tests, and vegetable varieties that have passed the DUS test or which originate from a country with which Tanzania has an agreement on seed regulations or quality control may be exempt from the NPT test. These similarities between Tanzania's regulatory requirements and the EAC Seed Bill may facilitate the implementation of the latter.

For variety release and registration, the National Seeds Committee performs a key role through the NPT-TC and NVRC. The NPT-TC has members from the Ministry of Agriculture, Food Security and Cooperatives, a higher learning institution, a crops research institution, and the Tanzanian Seed Trade Association (TASTA). The NVRC is composed of members from the Ministry of Agriculture, Food Security and Cooperatives, an agricultural university, TASTA, the Plant Breeders' Association, and the farmers' association. Both the NVRC and the NPT-TC regulate their own procedures.

TOSCI receives applications for variety release, oversees variety testing trials, collects data from trials, and submits reports and test data to the NPT-TC.[47] The NPT-TC assesses the reports and makes recommendations to the NVRC. After review, the NVRC advises the

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[43] New Markets Lab with the Southern Agricultural Growth Corridor of Tanzania Centre Ltd. for the Alliance for a Green Revolution in Africa, "A Legal Guide to Strengthen Tanzania's Seed and Input Markets", April 2016.
[44] New Markets Lab with the Southern Agricultural Growth Corridor of Tanzania Centre Ltd. for the Alliance for a Green Revolution in Africa, "A Legal Guide to Strengthen Tanzania's Seed and Input Markets", April 2016.
[45] Regulation 7(5) of the Seed Regulations.
[46] Edward Mbaya, Filbert Mzee, Alphonce Temu, and Mainza Mugoya, *Tanzania Brief 2017 - The African Seed Access Index*, available at https://tasai.org/tasai2016/wp-content/themes/tasai2016/img/tasai_brief_2017_tanzania_final_lr.pdf.
[47] Regulation 7(5) of the Seed Regulations, Tanzania.

National Seed Committee on the release of the variety.[48] Finally, the National Seed Committee advises the Ministry of Agriculture, Food Security, and Cooperatives on whether to approve the variety for release and ultimately makes the final determination for a variety to enter into the National Variety Catalogue, with TOSCI issuing a certificate of registration.[49]

Once the DUS and NPT tests have been conducted, TOSCI submits a report containing the tests results to the NPT-TC for review.[50] As mentioned above, the NPT-TC assesses the reports and makes recommendations to the NVRC. After review, the NVRC advises the National Seed Committee on the release of the variety. Finally, the National Seed Committee advises the Ministry of Agriculture, Food Security and Cooperatives on whether to approve the variety for release.[51] The Ministry of Agriculture, Food Security and Cooperatives makes the final determination regarding whether the variety can to enter into the National Variety Catalogue, and TOSCI issues a certificate of registration.[52]

Companies consulted reported some implementation problems with the variety release and registration process. For instance, the NVRC is not well funded, and, as a result, it does not sit as often as it should. While not widespread, there have been instances reported in which companies have paid to hold a meeting of an NVRC task force to verify required information. TOSCI noted that the NVRC has its own budget, but the applicant is free to request an NVRC meeting to evaluate his or her application at his or her own cost. Another significant implementation challenge reported relates to the submission of authentic samples of seed to TOSCI. Breeders are required to submit an authentic sample of pre-basic seed to TOSCI for reference purposes, or the National Seeds Committee will deny the release of the variety. The minimum amounts for the sample are (i) four kilograms for cereals, pulses, or any other major seed crops and (ii) 100 grams for small seed crops. For any other plant species, TOSCI has discretion to determine the required amount of sample. The breeder may also be asked to replenish the amount of the authentic sample for TOSCI. Because a tracking system for these samples is currently lacking, TOSCI's ability to maintain these samples or control their use can be a challenge, and companies have expressed concern with missing samples that need to be replenished. During the regional validation meeting, TOSCI reported that sometimes the samples are misplaced if the applicant does not follow the proper procedures on submission of these samples. A more transparent tracing system for seed samples and increased communication between TOSCI and the private sector concerning the testing process and results would improve trust between the regulators and private sector.

Tanzania's seed certification process is regulated under the Seed Act of 2003 (as amended in 2014), the Seed Regulations of 2007 and 2017 (amendment) and follows the OECD Seed Schemes and ISTA standards. The head of TOSCI is the Chief Seed Certification Officer, tasked with the approval of packaging requirements and evaluation of appeals of field inspection, among other functions. TOSCI has 48 public seed inspectors. There are not yet private seed

[48] Section 21 of the Seed Act, Tanzania.
[49] Section 21(2) and (3) and Regulation 8 of the Seed Regulations, Tanzania.
[50] Regulation 7(5) of the Seed Regulations.
[51] Section 21 of the Seed Act.
[52] Section 21(2) and (3) and Regulation 8 of the Seed Regulations.

inspectors in Tanzania, but the Tanzanian government is considering this regulatory change, in line with other countries' practices (e.g., Kenya). Lack of resources like vehicles is a primary challenge to carrying out inspection services throughout the country, including Zanzibar. TOSCI has one ISTA accredited laboratory. Zanzibar has one laboratory, but it is not well equipped for testing, and samples are currently sent to mainland Tanzania for testing. The World Bank is in the process of establishing a laboratory on the island under a project focused on rice production.

TOSCI, through its Chief Seed Certification Officer, is in charge of appointing inspectors and overseeing the certification process. Tanzania's seed regulations establish that thirty days after the seed crop is planted, a registered seed grower may apply to TOSCI for a field inspection. An authorized TOSCI inspector, in accordance with OECD Seed Schemes and ISTA standards, carries out the field inspection to assess compliance with standards and, when applicable, assigns a seed class to the seed inspected.[53] Once certification is obtained, seed can be harvested from approved fields or imported, properly marked in accordance with the regulations, and properly processes and stored. A registered dealer may then sell the certified seed, packaged and labelled in accordance with the seed regulations.[54]

Tanzania's rules provide for four seed classes equivalent to OECD's recognized classes and those under the EAC Seed Bill: pre-basic seed, basic seed, certified one, and certified two. Seeds classes are required to be clearly shown on seeds packaging. It should be noted that while Tanzania does not include QDS as one of its official seed classes, it does allow for sale of QDS and recognizes it under the 2003 Seed Act.[55] QDS is a seed class under SADC, of which Tanzania is a member, and is recognized as aligned with OECD Seed Schemes. Approved QDS seed must be clearly labelled as such before it can be sold.

Most companies reported that the certification process is quite clear; however, some noted that the process can be lengthy and expensive in practice. Companies also noted that TOSCI's limited resources and delays in inspections are challenges and that often they incur more costs than the fees stipulated in the regulations, which makes the process a bit unpredictable. Some of these costs include transportation for inspectors, their allowances, and photocopying expenses, among others.

To address counterfeit seed, Tanzania has implemented a scratch card system similar to Kenya's to verify whether seed is fake or not. However, this system is only applied to primary crops such as maize, and the labels are not mandatory. The costs of these scratch cards go into the final price and are borne by the farmers.

The EAC Seed Bill establishes a certification process for seeds to be traded within the region. In this sense, it requires that Partner States designate official testing laboratories and issue certificates, labels, and seals. Because Tanzania is already part of ISTA and is also following

[53] New Markets Lab with the Southern Agricultural Growth Corridor of Tanzania Centre Ltd. for the Alliance for a Green Revolution in Africa, "A Legal Guide to Strengthen Tanzania's Seed and Input Markets", April 2016.
[54] New Markets Lab with the Southern Agricultural Growth Corridor of Tanzania Centre Ltd. for the Alliance for a Green Revolution in Africa, "A Legal Guide to Strengthen Tanzania's Seed and Input Markets", April 2016.
[55] New Markets Lab with the Southern Agricultural Growth Corridor of Tanzania Centre Ltd. for the Alliance for a Green Revolution in Africa, "A Legal Guide to Strengthen Tanzania's Seed and Input Markets", April 2016.

OECD Seed Schemes, its certification system would seem to be compatible with EAC Seed Bill. However, implementation challenges remain, including lack of capacity and resources to render the process fully effective and operational.

TOSCI is also in charge of issuing import and export permits, certificates, and seals and labels to producers. Importers and exporters of seed in Tanzania are registered by TOSCI, which also receives applications for import or export of seed. Exporters are also required to apply to the Plant Health Services (PHS) Division for a phytosanitary certificate, while, for imports, inspection is done by the PHS at the port of entry and assessment made as to whether the imported seed meets the quarantine requirements in the Plant Protection Act. Tanzania has also published a pest list in the Gazette. On average, the importation and exportation of seed to and from Tanzania takes 12 days from the point of application. The country's seed imports mainly come from Kenya, Zambia, and Zimbabwe. It is important to note that import permits are usually issued across the country, while export permits are only issued in Dar es Salaam, which presents some challenges to seed exporters.

Tanzania is a member of UPOV and has adopted the PBR Act of 2012, which conforms to UPOV, and the Protection of New Plant Varieties (Plant Breeders' Rights) Regulations of 2018, as the main legal instruments governing PBRs in Tanzania.

Zanzibar grants protection of PBRs through its Act No. 1 of 2014, which contains provisions substantially equivalent to Tanzania's PBR Regulation. For PBR, Zanzibar shares the regulatory body and procedures with Tanzania.

The key regulatory body for PBRs in Tanzania is the PBRs Office, established under the PBR Act, with the mandate of granting plant breeders' rights; maintaining the PBRs register; facilitating the transfer and licensing of PBRs; and coordinating with domestic, regional and international bodies on all issues relating to PBRs. A breeder applies for PBRs to the Registrar of the PBRs Office, who may request that TOSCI conduct a DUS test on the sample. The PBR Office then submits the DUS results to the PBRs Advisory Committee for review, and, upon its recommendation, the PBRs Registrar may grant either provisional or final PBR protection, issue a PBRs certificate, enter the variety in the PBRs register in accordance with the regulations, and publish a notice of the grant of PBR and the approved denomination in the Gazette. The PBR holder is free to license out the rights of use of the protected variety, subject to limitations under the Act.

The EAC Seed Bill includes the protection of Plant Breeders Rights, based on UPOV. In particular, the EAC Seed Bill takes vocabulary and procedures from UPOV 1991. Harmonization of PBR and PVP under the EAC Seed Bill could help to preserve rights on protected varieties, expand knowledge on PBR and PVP, and render protection more enforceable. It would seem that implementation of the EAC Seed Bill provisions for PBR should not cause major challenges in Tanzania.

Companies noted, however, that their biggest challenge with Tanzania's PBR regulation is inadequate knowledge of PBRs. Moreover, since the Act considers that varieties that have been in the public for more than one year have lost their novelty, stakeholders raised concerns with claiming PBRs within a wider market. The EAC Seed Bill contain a provision that recognizes PVP protections that have been granted under other international or

national schemes, which means that any variety already protected under Tanzania's PVP law would still be protected after the EAC Seed Bill once it comes into force. However, those varieties that have not been protected under an international, regional, or national regime and have been marketed commercially for more than a year will not be covered under PBR protection and would be in the public domain.

Overall, Tanzania has in place most of the institutions and functions necessary for the implementation of the EAC Seed Bill. Institutionally, TOSCI is Tanzania's NSA and is capable of performing the main functions required by the EAC Seed Bill, including issuing certificates for regional trade in liaison with the NPPOs, providing regional seals and labels to seed producers, and providing training for the implementation of the EAC Seed Bill at the national level. TOSCI also develops functions as Tanzania's NPPO. Moreover, the NPT-TC and NVRC have functions equivalent to those required by the EAC Seed Bill, since they evaluate testing data provided, review applications, and make recommendations for the release of varieties. Since these institutions are established under national legislation, Tanzania may need to broaden their scope to include regional variety registration and other procedures. Also, Tanzania would need to designate the authority with the mandate to maintain and update the National Variety Catalogue and notify the EAC Seed Office of new varieties and withdrawals, which would logically be TOSCI.

Tanzania's regulatory procedures also align with EAC Seed Bill procedures in most instances. For variety release and registration, Tanzania's exceptions for DUS and NPT share similarities with the streamlined procedures in the EAC Seed Bill. Nevertheless, the concerns raised by companies regarding NVRC lack of funds to meet as often as necessary, along with TOSCI's inability to exercise effective control over seed samples, could become challenges with the implementation of the EAC Seed Bill. In this sense, harmonization could entail some additional tasks and require additional capacity and resources. For certification, Tanzania's procedures align, although capacity challenges noted in the consultations should be taken into account.

Seed companies in Tanzania will both benefit from and face costs from harmonization. Mainly, given the time it takes for the release of a variety and the associated costs, Tanzanian farmers might opt to purchase cheaper seeds from neighboring countries where seed companies have less cumbersome requirements and lower costs. This would imply that local seed companies may face strong competition from neighboring countries. However, Tanzanian seed producers will be able to compete against seed companies from other neighboring countries with more complex and expensive regulatory procedures.

Harmonization under the EAC Seed Bill will rely upon implementation of good practices by the Partner States, such as conducting border post controls, adopting pest risk analysis procedures according to international standards, maintaining and updating national quarantine and non-quarantine pest lists for seed, and adopting the EAC quarantine and regulated non-quarantine pest lists for seed. Tanzania already has a system in place to conduct border controls, through the PHS, and maintains a pest list published in the Gazette. Nevertheless, Tanzania should verify whether its pest list is similar to EAC's quarantine and non-quarantine pest lists.

Tanzania's Regulatory System for Fertilizer

Tanzania's regulatory framework for fertilizers includes the registration of fertilizer and fertilizer supplements, licensing of fertilizer dealers, testing of fertilizer in accordance with the standards set by the Tanzania Fertilizer Regulatory Authority (TFRA), and import and export permits for fertilizer trade. The fertilizer industry in Tanzania is regulated under the Fertilizers Act of 2009 (as amended in 2014), the 2011 Fertilizers Regulations (as amended in 2017), and the National Agricultural Policy adopted in 2013. The Act establishes the TFRA, with the mandate of regulating all matters relating to fertilizers in Tanzania, including overseeing quality, licensing of fertilizer dealers, regulation of imports and exports, and implementation of regulatory frameworks relating to fertilizer. In addition, Tanzania's regulations require importers of subsidized fertilizers to go through a bulk procurement process.

TFRA has the mandate for the fertilizer registration process, and new fertilizer must undergo laboratory and field testing by TFRA for one season to determine its suitability for use (Note: this was recently changed from three seasons to one season). For existing fertilizers, the TFRA Director should register fertilizer within 14 days after receiving the testing report; for new fertilizer, the TFRA Director should registers fertilizer within 21 days and issue a registration certificate.

Tanzania's Fertilizer Regulations also provide procedures for registration of fertilizer dealers. An application for registration as a dealer can be made to the Director of the TFRA, who can issue a certificate of registration within 14 days. The certificate is valid for at least two years, unless cancelled.

The Tanzania Bureau of Standards (TBS) is mandated to oversee importation of fertilizers and conduct quality control tests in its laboratories to ensure compliance with established standards. TBS issues labelling and packaging instructions, and TFRA is mandated to verify their compliance.

Stakeholders reported challenges with implementation of Tanzania's laws and regulations on fertilizer. During the national consultation and validation meetings, stakeholders from the public sector mentioned that the registration process is online and supposedly free of charge. However, private sector stakeholders, including companies, reported that the registration process is lengthy, costly, and not easy to understand. Moreover, field consultations revealed limited capacity of TFRA to fully implement the regulations, including absence of a laboratory to do the testing, with samples often sent to the government institutions' laboratories and trials conducted at Tanzania Agricultural Research Institute (TARI) Centres. TFRA also has very few inspectors, who have numerous responsibilities and work with very few resources. Furthermore, an increasing level of counterfeit fertilizer has been reported, and stakeholders have raised the need to train agro-dealers and farmers in identifying fake fertilizer and equip farmers with the skills to safely use fertilizer.

Expected Impact (Costs) Accruing to Government of Tanzania as a Result of EAC Harmonized Seed Bill

- The main investments and costs for the Tanzanian government regarding the harmonization of seed and fertilizer involve increasing the level of support given to seed inspectors to help reduce costs and minimize delays.;

- Additionally, decentralizing the issuance of export permits (which at present can only be obtained in Dar es Salaam) will involve extra investments in terms of recruitment of new staff in different regions;
- Increased number of authorized and trained inspectors, including through authorized private seed inspectors, and increased support and resources for seed inspectors (including more vehicles) so that the seed certification process will be more efficient and the supply of seed will be able to meet the potential demand in the region;
- Development of awareness campaigns for farmers related to the importance of improved seeds;
- Training and more extension workers will be critical to expanding access of improved seed by smallholder farmers in Tanzania. Although Tanzania's ratio of extension workers to smallholder farmers is high within the region (1:830) and close to Rwanda's ratio, more extension workers will be required to increase use of improved seed varieties and improved agronomic practices;
- Expenditure will be needed to hire qualified inspectors and equip laboratories for seed testing in Zanzibar;
- Companies will incur in expenditures related to awareness campaigns, and labelling and packaging requirements; and
- Smallholder farmers might suffer from a slight increase in seed price as an impact of higher costs of production due to the implementation of the EAC Seed Bill.

Expected Impact (Benefits) Accruing to Government of Tanzania as a Result of EAC Harmonized Seed Bill

- Small farmers will benefit from access to wider variety of quality seeds from the local market;
- Increased revenues from import duties, since companies from other EAC Partner States will be able to supply seed to Tanzania with greater ease;
- Expansion of local and regional markets due to the improvement of seed companies production.;
- Increased production and productivity, leading to food security;
- Increased government revenues from market expansion; Increased revenue from VAT and charges on variety release and certification processes with the expected increase in the number of seed breeders and producers as well as agro-dealers; and
- Increased export earnings from increased varieties exported to the EAC Partner States.

Expected Impact (Costs) Accruing to Government of Tanzania as a Result of EAC Harmonized Fertilizer Bill

- While Tanzania has a regulatory process for registration and testing of fertilizers, lack of capacity and resources remain the main obstacles for the implementation of the system; the government, through the Ministry of Agriculture and TFRA, is likely spend more on capacity through recruiting more inspectors and equipping the fertilizer testing laboratories, including building capacity in soil analysis;
- Expenditure will be needed to build capacity, hire qualified inspectors, and equip laboratories for fertilizer testing in Zanzibar;
- Smallholder farmer awareness campaigns are needed on proper usage and adoption of fertilizers; this will also involve extra costs in terms of providing capacity to fertilizer dealers who distribute fertilizers to farmers; and
- Capacity building is needed in the areas of monitoring and enforcement, in particular, for adoption of measures to combat counterfeit fertilizer.

Expected Impact (Benefits) Accruing to Government of Tanzania as a Result of EAC Harmonized Fertilizer Bill

- Harmonization of fertilizers could overcome some of the challenges noted by stakeholders by establishing a common system, building capacity, streamlining procedures, and sharing information among EAC Partner States;

- Harmonized testing and standards for fertilizer at the regional level would also help increase availability of fertilizer;

- Increased revenues from import duties, since fertilizer companies from other EAC Partner States will be able to supply fertilizer to Tanzania with greater ease;

- With the harmonization, agro-dealers in fertilizer sub-sector are likely to increase and, thus, the government is expected to generate revenues through local service taxes imposed on these merchants as well as through registration fees that these dealers pay to the government to be issued licenses; and

- Removal of border restrictions and alignment of structures with other regions should help facilitate regional trade, improve food security, and increased revenue to stakeholders.

Rwanda Regulatory Snapshot and Cost-Benefit Assessment

Rwanda's Seed Regulatory System

Rwanda's seed industry is underdeveloped, and the adoption of improved varieties is relatively low, ranging between 7 percent to 13 percent across the country. The formal seed system represents only three percent of the sector. The Rwanda Agriculture and Animal Resources Development Board (RAB)) is responsible for producing breeder and pre-basic seeds for the main economic crops, such as maize, beans, rice, and wheat. Rwanda mainly depends on seed imports. The Ministry of Agriculture and Animal Resources has officially launched the National Seed Association of Rwanda, bringing together seed traders, seed multipliers, agro-dealers, and institutions that develop plant varieties and provide quality seed to farmers.

Rwanda has a total of 11 active seed breeders, and, on average, 6 maize varieties have been released during the last 3 years. Most seed producers in the country are individual producers. RAB and international research institutes do most of the plant breeding, and seed companies that have breeding services out of the country import foundation seed. Breeding is mostly concentrated in six priority crops: maize, wheat, bean, soya bean, cassava, and sweet potato. Seed producers source almost all foundation seed for the priority crops from RAB, but the process is found to be a bit cumbersome, with companies required to pay through a specific bank and present proof of payment to RAB headquarters in Kigali in order to get the seed.

Rwanda's seed regulatory framework was recently adopted in 2016, and it aims to regulate the different processes along the seed value chain. The Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA) is Rwanda's main institution and is mandated with the oversight of the variety release and registration processes, inspection, certification,

and quality standards. Rwanda's regulatory system also sets out the procedures for certification, testing and labelling, although the system is not yet fully implemented. Since RICA is not physically established yet, some of its functions are still under the scope of other public institutions. For instance, the Rwanda Agricultural and Livestock Inspection and Certification Service (RALIS) handles the import and export procedures for seeds in the territory. Additionally, the National Seed Release Committee is currently under MINAGRI, but will be under RICA once established.

While Rwanda's laws regulating the seed sector are relatively new, they are rather comprehensive. Law No.005/2016 of 05/04/2016 Governing Seed and Plant Varieties is the key legislation governing the seed sector in Rwanda. The law regulates plant variety release and registration, seed production, seed certification, seed importation and exportation, plant variety protection, and plant breeders' rights. The law is supported by several ministerial orders that provide procedural guidelines on the implementation of the seed law, including: Ministerial Order No 002/11.30 of 11/04/2017 which determines the modalities for the assignment and transfer of plant breeder's rights; Ministerial Order No 003/11.30 of 11/04/2017 which determines the modalities for testing the distinctness, uniformity and stability of plant variety; Ministerial Order No 004/11.30 of 11/04/2017 which presents the format and content of the register in which all information related to the plant breeder's rights is recorded and the conditions for having access to such information; Ministerial Order No 005/11.30 of 11/04/2017 which establishes the criteria for recognizing a seed testing laboratory; Ministerial Order No 006/11.30 of 11/04/2017 which determines the procedures for seed inspection and granting of seed quality certificates; Ministerial Order No 007/11.30 of 11/04/2017 which sets forth the requirements for a person to be granted a license for importing and exporting seeds; Ministerial Order No 008/11.30 of 11/04/2017 which establishes the information that a quality seed label and container have to bear and the criteria for putting seed varieties in categories and the colors of labels for each category; Ministerial Order No 009/11.30 of 11/04/2017 which sets the requirements for a person to be authorized to become a quality seed producer, conditioner, or dealer; Ministerial Order No 010/11.30 of 11/04/2017 which establishes the procedures for evaluation, certification, and registration of plant varieties and procedures for the withdrawal of certified plant varieties from the list and its format; and Ministerial Order No 011/11.30 of 11/04/2017 which establishes the organization and functioning of the committee responsible for evaluation, certification, and registration of plant varieties and their withdrawal from the list.

Since Rwanda's regulations have recently been updated, there are still numerous gaps in implementation. In particular, the new institutions and regulatory bodies need resources and personnel in order to be fully operational. Initially, the seed industry in Rwanda was dominated by the public sector, and RAB regulated all the activities, including breeding, variety release and development, assessment of seed dealers, and other functions. The updated regulatory system attempts to liberalize the seed sector and increase involvement by the private sector. In the stakeholder consultations, some of the representatives from the private sector expressed that training and dissemination programs regarding the updated regulatory system will be necessary to inform the private sector of the new processes and procedures.

RICA was established under Law No 31/2017 of 25/07/2017 and falls under the Ministry of Agriculture and Animal Resources. RICA is an autonomous body with the statutory mandate of overseeing the variety release and registration process, conducting inspection and seed certification, ensuring compliance with seed quality and standards, regulating import and export of seed, and enforcing phytosanitary standards. RICA has the authority to appoint a plant variety registrar, who can exercise control in case of a violation of the ministerial order's provisions relating to variety release and registration.[56] There is also a PRR Registrar, charged with reviewing and approving applications for PVP and PBR, conducting tests, and updating the PBRs register.

Rwanda's regulations require that new varieties be tested for DUS and VCU for two growing seasons, on at least three sites, before they can be registered on the National Plant Variety List.[57] The procedure admits application for exemption from DUS tests if the variety has passed the test in at least two member countries within regional or international organizations of which Rwanda is member.[58]

Applications for variety release and registration are submitted to the Plant Variety Evaluation, Certification and Registration Committee (Committee), which was established in 2018 and is responsible for evaluation, certification, and registration of plant varieties on the national varieties list.[59] The Committee is comprised of ten individuals, with members from the Ministry of Agriculture and Animal Resources, a plant breeder, a pathologist or entomologist, an agronomist, an expert in seed legislation, an expert in agricultural extension, a private seed dealer, and a representative of farmers' organizations.[60] The Committee is mandated to meet twice each year, but extraordinary sessions can also be held whenever necessary.[61]

The regulatory system for variety release and registration is relatively new. The Committee was only recently established in 2018 and has had only two sittings since. During these sittings, the Committee reviewed 146 applications for variety release. The process even involved recalling varieties that were already commercialized to be assessed based on relevant data. After deliberation, some varieties were recommended for release, while further data was required for others. It should be noted that, if a variety has been released under COMESA or registered in two other countries within a regional bloc to which Rwanda

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[56] Articles 6 and 7 of Law No. 005/2016 OF 05/04/2016, Governing Seeds and Plant Varieties in Rwanda.
[57] Article 4 of Ministerial Order no 010/11.30 of 11/04/2017 Determining the Procedures for Evaluation, Certification and Registration of Plant Varieties, Procedures for the Withdrawal of Certified Plant Varieties from the List and its Format, Official Gazette No. 16 of 2017.
[58] Article 2 of Ministerial Order no 010/11.30 of 11/04/2017 Determining the Procedures for Evaluation, Certification and Registration of Plant Varieties, Procedures for the Withdrawal of Certified Plant Varieties from the List and its Format, Official Gazette No. 16 of 2017.
[59] Law No. 005/2016 OF 05/04/2016, Governing Seeds and Plant Varieties in Rwanda.
[60] Article 2 of the Ministerial Order no 011/11.30 of 11/04/2017 determining the organization and functioning of the committee responsible for evaluation, certification and registration of plant varieties and their withdrawal from the list.
[61] Article 5 of the Ministerial Order no 011/11.30 of 11/04/2017 determining the organization and functioning of the committee responsible for evaluation, certification and registration of plant varieties and their withdrawal from the list.

is a member, the NVRC will still require testing for at least one season of NPT, since the Ministry of Agriculture considers Rwanda to have unique agro ecologies. This has presented a challenge for regional harmonization in COMESA and will similarly be an issue with EAC rules.

According to the EAC Seed Bill, new plant varieties can be released after two seasons of DUS and VCU testing, and varieties released in one EAC partner shall be tested for one season and fulfil the release criteria under similar agro-ecological conditions in a second EAC Partner State if the NSA of the first Partner State shares the data used to release the seed in the second Partner State, while varieties released in two EAC Partner States may undergo automatic release in a third EAC Partner States with similar agro-ecological zones if the data used to release the plant variety in the two Partner States is available and verified by the EAC Seed Office. In addition, government authorities reported during national validation meetings that Rwanda allows for a streamlined procedure for varieties released in one other EAC Partner State. Rwanda's system does not appear to be aligned with this aspect of the EAC Seed Bill.

Rwanda's seed certification process falls under the mandate of RICA. However, since RICA has not yet been physically established, RAB continues to conduct certification of seed in Rwanda. Stakeholders consulted anticipate that once RICA is established, inspectors under RAB would be transferred to RICA, since RICA has not yet trained inspectors. Seeds must be subjected to inspection to obtain the seed quality certificate and be commercialized in the market.

Ministerial Order No 006/11.30 of 11/04/2017 determines the procedures for seed inspection and issuance of seed quality certificates. In 2017, Rwanda authorized private seed inspectors, but stakeholders have reported high costs of inspections and certification as major issues. Rwanda's legislation recognizes five seed classes: pre-basic seed, basic seed, first generation certified seed, second generation certified seed, and quality declared seed.

The EAC Seed Bill establishes a certification process for seeds to be traded within the region. In this sense, it requires that Partner States designate official testing laboratories, and issue certificates, labels, and seals. While RICA is legally already tasked with functions similar to those required by the EAC Seed Bill for certification, testing, and labelling, the system is not yet fully operational. Currently, Rwanda lacks ISTA-accredited seed laboratories and has limited staffing, inspectors, infrastructure, and funds to carry out the process. Considering that the procedures were very recently developed and are still being implemented, it is not clear how the process will work in practice.

The import and export of seed are regulated under Rwanda's Seed Law and Ministerial Order no 007/11.30 of 11/04/2017, which determines the requirements for obtaining a license for importing and exporting seeds. To import seed in Rwanda, a registered seed dealer applies to RICA for an import permit. The application must be accompanied by a phytosanitary certificate and an orange ISTA certificate or a COMESA seed certificate, a seed testing certificate issued by a competent authority, a fumigation certificate or proof that the seeds have been treated before dispatch, and any other relevant documents. If RICA finds that an application complies with these requirements, it issues the seed dealer with an import permit. The seed imported must be of a variety that is registered on the plant variety list and comply with the minimum seed standards, including packaging and labelling standards.

For exports, the exporter must apply to RICA for a phytosanitary certificate, accompanying the application with a valid seed certificate that proves that the seed complies with the relevant regional seed standards, a copy of the fumigation or seeds treatment certificate, and any other required document. After inspection, sampling, and laboratory testing, RICA may issue a phytosanitary certificate. The exported seed must be accompanied with an export permit from RICA and a phytosanitary certificate, conform to the regional seed standards, and be properly packaged and labelled.

Since RICA is not yet in place, RALIS is handling the procedures for import and export of seed in Rwanda. Seed companies consulted expressed a clear understanding of the current process for the import and export of seeds. Currently, however, Rwanda does not have an ISTA-accredited laboratory and is not yet fully competent to issue phytosanitary certificates. However, Rwanda is in the process of establishing an ISTA-accredited laboratory, and equipment tests and training of personnel are ongoing.

Seed companies also raised concerns related to implementation of Rwanda's subsidy programme, which reportedly interferes with companies' ability to import seed into Rwanda. According to seed companies, the largest percentage of the seed that is sold on the Rwandan market is through the procurement process by the government. This interferes with market pricing by seed companies. Moreover, the government does not seem to have an exit strategy for the subsidy programme. Companies believe that the subsidy programme will continue to curtail investment and growth in Rwanda's seed industry. The subsidy programme only covers a few crops like maize and provides a subsidy of between 60 to 80 percent, in the interest of ensuring food security. Currently, RAB has criteria for choosing farmers who get to benefit under the subsidy programme, and the rest have to buy seed at full price.

Seed companies also reported extra costs to comply with packaging requirements. Due to Rwanda's ban on imports or use of single-use plastic items, companies usually need to repackage seed before they import it into Rwanda.

Harmonization under the EAC Seed Bill will rely upon implementation of good practices by the Partner States, such as conducting border post controls, adopting pest risk analysis procedures according to international standards, maintaining and updating national quarantine and non-quarantine pest lists for seed, and adopting the EAC quarantine and regulated non-quarantine pest lists for seed. Since Rwanda is not fully aligned with international standards yet and is still making relevant authorities fully operational, implementation of the EAC Seed Bill could entail challenges.

Rwanda has implemented the protection of Plant Breeders Rights (PBR) in the Law No.005/2016 of 05/04/2016 Governing Seed and Plant Varieties, and the following Ministerial Orders; Ministerial Order No 002/11.30 of 11/04/2017, determining the modalities for the assignment and transfer of plant breeder's rights; Ministerial Order No 003/11/30 of 11/04/2017, determining the modalities for testing the distinctness, uniformity and stability of plant variety; Ministerial Order No 004/11.30 of 11/04/2017 determining the format, content of the register in which all information related to the plant breeder's rights is recorded and the conditions for having access to such information; and

Ministerial Order No.15/11/30 of 06/11/2017 determining the modalities for lodging an objection to the application for plant breeder's rights.

Currently, the PBR registrar has the mandate over the PBR registration process in Rwanda. The regulations grant PVP to new, distinct, uniform, and stable varieties. The PBR registrar is charged with conducting the required tests; however, there is a need for capacity building in this area. There are not yet forms for registration, and PBRs have not yet been issued by the Ministry of Agriculture and Animal Resources.

The EAC Seed Bill includes the protection of Plant Breeders Rights, based on UPOV. In particular, the EAC Seed Bill takes vocabulary and procedures from UPOV 1991. Harmonization of PBR and PVP under the EAC Seed Bill could help to preserve rights on protected varieties, expand knowledge on PBR and PVP, and render protection more enforceable. While Rwanda is using UPOV procedures, the system is not yet fully implemented. The Ministry has acknowledged the need for streamlining PVP at the regional level. Consulted stakeholders reported the lack of protection under PBR as an issue. In this sense, the adoption of the EAC Seed Bill could help to overcome the current challenges Rwanda is facing to implement the system.

In relation to EAC Seed Bill requirements, it seems that, although it is not yet physically established, Rwanda has identified a designated national authority, RICA, mandated with functions related to variety release and registration, that could administer and manage relevant processes according to the requirements of the EAC Seed Bill. Rwanda could consider expanding RICA's scope to include the issuance of test certificates, import and export permits, and seals and labels, as established by the EAC Seed Bill. The EAC Seed Bill also calls for the designation of an authority to maintain and update the National Variety Catalogue and notify the EAC Seed and Plant Variety Committee of new varieties and withdrawals. Substantively, while Rwanda's newly amended seed regulatory system aligns with many aspects of the EAC Seed Bill, some gaps remain. In particular, Rwanda would also have to include a regulatory provision allowing for a streamlined regional variety release procedures, similar to the provision in Kenya's rules, when a variety has been released in one or two Partner States. Moreover, Rwanda will need to establish ISTA accredited laboratories and overall build capacity in the certification process. Also, Rwanda would need to make its pest list publicly available. Overall, Rwanda can greatly benefit from harmonization; however, it should be noted that timely implementation of national and regional rules and regulations is of the essence, since a lag in implementation could result in local producers facing competition from more established regional producers who could import their products. It is also important to note that some costs to seed companies could arise due to the need for farmer awareness programmes on usage and adoption of improved and certified seed.

Rwanda's Fertilizer Regulatory System

The regulatory structure for fertilizer in Rwanda is quite new, with public sector domination of the market. Fertilizer manufacture, import, distribution, use, storage, sale, and disposal in Rwanda are regulated under Law No. 30/2012 on Governing of Agrochemicals and Ministerial Order No 002/11.30 of 14/07/2016 determining regulations governing agrochemicals. These regulations include a list of prohibited and acceptable fertilizers.

RALIS and MINAGRI are currently regulating trade in fertilizer, but under Law No 31/2017 of 25 July 2017, RICA has the authority. RICA, however, has not yet been established, but it will assume these functions once it is operational. Currently, the registrar of agrochemicals within RALIS registers all fertilizer, licenses agro-dealers and manufacturers, registers premises where fertilizer is stored, and issues import and export permits (again, these functions will shift to RICA once it is operational). Applications for fertilizer registration involve testing and evaluation to assess whether the fertilizer is safe to human health. Testing is done by RAB for a minimum of two crop-growing seasons in different field locations in Rwanda, and the applicant bears the responsibility of covering all costs involved. After testing, RAB compiles a technical report with the test results and forwards it to the Advisory Council, which then analyses the technical report and forwards it to the registrar for final determination. After assessment, and based on the recommendation of the Advisory Council, the registrar may accept the registration of a fertilizer and issue a certificate of registration, temporarily register the fertilizer and issue a provisional registration of the fertilizer while the fertilizer undergoes laboratory tests and field trials, or reject the application.

Rwanda's regulations also require that the premises where the fertilizer is manufactured, loaded, sold, stored, or repackaged be registered. An applicant is required to describe the premise and its design, location, affiliated business name, retention capacity, personal protective equipment for the employees, premise equipment, and safety measures. After receiving an application, the registrar is in charge of the inspection, review of the report, and issuance of the certificate of registration of the premises. The registration of premises is valid for 5 years. In addition, dealers in fertilizer, whether importers, exporters, distributors, or retailers are required to acquire a license from the registrar of agro chemicals.

Under the Agro Chemicals Law, fertilizer can only be imported or exported under certain conditions. According to stakeholders consulted, almost all of the fertilizer sold on the Rwandan market is through the fertilizer subsidy programme. The regulations provide that importers of subsidized fertilizers shall go through a bulk procurement process.

While instances of fake fertilizer are a challenge in most of the countries in the region, such cases have been minimal in Rwanda. All companies that intend to import and sell fertilizer in Rwanda can only do so successfully through the bulk procurement process. The government announces calls for bids, and interested companies place their tenders. Those that qualify receive an import permit by RALIS with the amount of fertilizer they are qualified to import under the tender. The authorized importers also do not get to directly supply to the farmers. The distribution of fertilizer is done by the government under the fertilizer subsidy programme. RALIS conducts awareness building to prevent the use of counterfeit and adulterated fertilizer.

Imported fertilizer is subjected to testing to assess its compliance with Rwanda's fertilizer standards. The RSB sets standards for fertilizer based on EAC standards. The testing on fertilizer is conducted by RSB and NAEB, while field tests are currently conducted by RAB.

The regulations also provide for labelling and packaging, storage, and use. Rwanda's regulations follow international conventions on environmental protection. Previously, fertilizer importers packaged fertilizer in sacks, but a new regulation banning the use of any

non-biodegradable plastic bags has changed this practice. Companies consulted have asserted that fertilizer is a very delicate product and that the way in which it is stored can affect its quality.

Expected Impact (Costs) Accruing to Government of Rwanda as a Result of EAC Harmonized Seed Bill

Overall, Rwanda's legal framework appears to be compatible with the EAC Seed Bill; however, challenges could arise with respect to new regulatory procedures provided for under the bill.

- While Rwanda has adopted a comprehensive set of laws related to seeds, this system is new, and Rwanda still faces significant implementation challenges and capacity constraints;
- Costs will arise as RICA is made operational and takes over the functions currently performed by RAB and RALIS;
- Certification procedures, accreditation of laboratories and inspectors, and effective implementation of PVP are still at a very early stage and need to be further developed in order to function in practice;
- Rwanda's system will need to incorporate aspects of the EAC Seed Bill's provisions for regional variety release, including the EAC Seed Bill's streamlined procedures for varieties already released in two Partner States with similar agro-ecological conditions;
- Rwanda is not yet a member of ISTA and should consider membership, which bears costs and will require equipping the national testing seed laboratory;
- Implementation and publication of the quarantine and non-quarantine pests list as established by the EAC Seed Bill;
- Increased availability of extension services to smallholder farmers to enhance their knowledge on the use of improved seed varieties;
- Facilitation of the national variety release committee to conduct regular variety release committee meetings;
- Strengthened capacity of local seed producers to produce and process certified seed;
- Improved quality control among seed producers, including registering all seed producers and packaging all seed;
- Slight increases in seed prices for smallholder farmers as an impact of higher costs of production due to the implementation of the EAC Seed Bill;
- Strengthened agro-dealer networks through training and accreditation;

- Disassociation of the Rwanda Agricultural Board and the Rwanda Agricultural and Livestock Inspection Services and designation of a semi-autonomous national seed and plant health authority, which will bring efficiency in the processes of variety releases and certification; and
- Because Rwanda's system is new, there may be possible costs if markets with more robust regulatory practices do not exercise mutual recognition.

Expected Impact (Benefits) Accruing to Government of Rwanda as a Result of EAC Harmonized Seed Bill

- Increased revenues from import duties, since companies from other EAC Partner States will be able to supply seed to Rwanda with greater ease;
- Expansion of local and regional markets due to production improvements;
- Small farmers will benefit from access to a wider variety of quality seeds from the local market;
- Increased revenue from VAT and charges on variety release and certification processes, with an expected increase in the number of seed breeders and producers as well as agro-dealers; and
- Improved seed sector that can sufficiently produce for local demand, also reducing costs of importation of seeds

Expected Impact (Costs) Accruing to Government of Rwanda as a Result of EAC Harmonized Fertilizer Bill

- Rwanda will likely incur expenditures in order to implement the fertilizer regulatory system, which include making the new regulatory body RICA operational.
- Lack of capacity and resources will be a challenge for the implementation of the system; therefore, the government is likely spend more on recruiting inspectors and equipping fertilizer testing laboratories, including capacity in soil analysis; and
- Similarly, the government needs to spend more on smallholder farmer awareness campaigns on proper usage and adoption of fertilizers. This will also involve extra costs in terms of providing capacity to fertilizer dealers who distribute fertilizers to farmers.

Expected Impact (Benefits) Accruing to Government of Rwanda as a Result of EAC Harmonized Fertilizer Bill

- Harmonization of fertilizers could overcome some of the challenges noted by stakeholders by establishing a common system, building capacity, streamlining procedures, and sharing information among EAC Partner States;

- Harmonized testing and standards for fertilizer at the regional level would help increase availability of fertilizer in Rwanda, which heavily relies on imports; and

- Removal of border restrictions and alignment of structures with other regions should help facilitate regional trade, improve food security, and increased revenue to stakeholders.

South Sudan Regulatory Snapshot and Cost-Benefit Assessment

South Sudan's Seed Regulatory System

South Sudan's population was estimated at 12,230,730 people as of 2016 (World Population Prospects, 2018), and the country's GDP is growing at the rate of 3.4 percent. South Sudan's agricultural value added is growing at a rate of 3.1 percent, and the sector contributes 0.6 percent of the economy's GDP growth per annum. The country is undergoing socio-political instability, and oil is the major contributor to the national economy. Agricultural production is low, and food insecurity is increasingly high. South Sudan has six main agro-ecological zones with differing agricultural potential: arid belt, flood plains, green belt, hills and mountains, iron stone plateau, and Nile/Sobat corridor. These are suitable for a wide range of crops, which implies that there is great potential for agricultural development in South Sudan.

The formal seed system in South Sudan is almost non-existent. The bulk of seed is supplied through informal systems. Many farmers get support through relief seeds, especially after catastrophes. Most formal seeds are imported as relief support to farmers. Some of the regional seed companies are slowly entering the market.

After independence, South Sudan established the Ministry of Agriculture and Food Security (MAFSC) in 2010, with support from regional and international organizations. Instability has rendered most of the existing seed companies ineffective, and many have temporarily relocated to Uganda. Consequently, the country largely depends on food imports despite fertile land and an array of agro-ecological zones where various crops can be grown. AGRA mentors the Seed Trade Association, which is still in its infancy.

South Sudan's regulatory framework is very limited, and South Sudan is the only country in the EAC region that does not yet have policies, laws, and regulations governing the seed sector. The Seed Policy has been at a draft stage since 2016 and is currently awaiting approval of the Council of Ministers and then the Parliament. South Sudan has no regulations for the protection of PBR or for the regulation of trade and use of fertilizer. South Sudan's main instrument for variety release is the Variety Release Guidelines, issued by the Ministry of Agriculture in 2016.[62]

[62] Ministry of Agriculture and Food Security, South Sudan Variety Release Guidelines, September 2016.

The seed sector falls under the Research and Plant Protection Directorates of MAFS, which suffers from limited funding. Non-governmental organizations and the Food and Agriculture Organization (FAO) lead the seed sector, with an emphasis on community-based production of quality declared seeds. Seed production, in collaboration with MAFS, is geared toward topping up imported seeds and food items from neighboring countries for distribution.

Through AGRA, the research department of MAFS increased local capacity for breeding varieties of maize, sorghum, rice, beans, cowpeas, groundnuts, sesame, and cassava. Breeding programs focus on developing disease resistant, drought tolerant, and high yielding varieties. Nevertheless, commercial seed companies acquire most parent seeds from national and international research stations. Vegetable seeds are not being produced in South Sudan on a commercial basis, except for crops such as okra. AGRA-supported seed companies are emerging in the country, with additional funding from U.S. Agency for International Development (USAID), the Howard Buffet Foundation, and the Dutch government.

The research department of the Ministry of Agriculture and the agricultural universities do public breeding in South Sudan. The seed companies have been under-capacitated both in terms of resources and skills and are thus unable to engage in seed production, although capacity building for companies is taking place through AGRA as noted.

MAFS is the main authority regulating the seed sector in South Sudan, with three main directorates that play significant roles: crop production, plant protection, and research. The Crop Production department is generally mandated with overseeing crop development, regulation, and agricultural production; the Plant Protection department is responsible for ensuring plant health; and the Research Department coordinates all agricultural research activities.

There is also a NVRC, which is composed of members from ASARECA, AGRA, seed companies, and representatives from STASS, MAFS, the National Legislative Assembly, and public universities. The NVRC sits once a year and is supposed to be funded by MAFS, since part of its mandate is to oversee agricultural development activities. However, due to the ministry's limited funding, AGRA has been helping to fund the NVRC. The NVRC follows the Variety Release Guidelines issued by the Ministry of Agriculture.

The EAC Seed Bill requires that Partner States designate a National Seed Authority in charge of overseeing the processes of variety release and registration and seed certification. Currently, in South Sudan, MAFS, through its directorates, is involved in these processes to the extent possible due to the lack of formal laws and regulations. Moreover, the NVRC can potentially also be a key institution in the process of seed variety release and registration.

South Sudan would likely need to implement its seed policy or consider broadening the functions of MAFS and the NVRC to include other functions included in the EAC Seed Bill, such as maintaining and updating the National Variety Catalogue and notifying the EAC Seed and Plant Variety Committee of new varieties and withdrawals. Furthermore, South Sudan should determine which authority would be in charge of providing regional seals and labels to seed producers and providing training for the implementation of the EAC Seed Bill at the national level.

South Sudan's constraints due to the lack of a regulatory system will be a challenge for the implementation of the EAC Seed Bill. On the other hand, harmonization could help to finally institute and implement formal processes and render the system more efficient, transparent, and predictable.

Since there are no laws governing the seed sector, the process of variety release and registration is not based on a legal framework but rather on practice and the Variety Release Guidelines applied by the NVRC.

The guidelines require that an application for variety release be submitted in writing and electronically to the Director of Agricultural Research Directorate in the Ministry of Agriculture, through the NVRC. The application should be accompanied by agronomic and pest data, quality data, a variety description, and the status of the breeder and foundation seed. The variety is then subjected to testing by the Directorate of Research under the following conditions:

- Cereal and legume grains require a minimum of 6 locations-years collected in two cropping seasons for agronomic performance for national breeders' identified lines;
- Cereal and legume grains require a minimum of 6 location per year collected in one cropping season for agronomic performance for variety released in a similar agro-ecology in the Eastern and Southern Africa region;
- Perennial crops require data from three harvest years, not including the year of seeding, at four locations, with at least one location providing an estimate of dry season stress and/or drought tolerance;
- Horticulture and specialty crops require a minimum of one location and three cropping seasons; and
- The testing period and steps for native plants shall be developed by the committee in consultation with expertise familiar with standards for source identified or selected class germplasm.

The Variety Release Guidelines reportedly include an exemption to testing if the variety has been registered in another ASARECA member country. South Sudan also admits a streamlined procedure for varieties registered and released in other EAC Partner States, only requiring a NPT test.

After testing, the NVRC reviews the application, bases its decision on whether the variety has "unique characteristics or special-use considerations," and recommends to the Directorate of Research whether the release of the variety; the Directorate of Research has the final decision on whether a variety should be released. If accepted, the variety can be entered in the National Variety Catalogue. Currently, there are 21 varieties on the National Variety Catalogue, all developed by either the Directorate of Research or the public agricultural universities. It should be noted that the National Variety Catalogue is not publicly available.

The seed companies consulted expressed a lack of understanding of the variety release process. Seed companies did not know of the existence of a NVRC and noted that the National Variety Catalogue is not publicly available. Companies also highlighted a conflict due to the fact that the Directorate of Research under the Ministry of Agriculture is both the main breeding institution in South Sudan and the authority with the ultimate decision on variety

release. Companies suggested that an independent Seed Unit be formed to review variety release and registration applications as well as develop regulations that streamline and align the process with the regional harmonized seed regulatory frameworks. However, during national validation meetings, government authorities reported that the variety release and registration process was under the scope of the Directorate of Research, and thus no conflict of interest existed.

The EAC Seed Bill sets out clear procedures and requirements for the release of varieties in the region, along with exceptions and streamlined procedures for DUS or VCU/NPT when a variety has been released in one or two countries within the region. If South Sudan were to implement a formal and uniform procedure similar to the one contained in the EAC Seed Bill, it could render the process more transparent and also address stakeholder concerns.

Nevertheless, challenges related to the lack of resources, in particular for the NVRC, remain pervasive and will affect the implementation of the EAC Seed Bill and the additional functions related to harmonization of regulatory processes.

The certified seed classes in South Sudan are not clear yet, although government authorities reported that they were included in the Draft Policy. Almost all seed in South Sudan is imported. AGRA has developed a set of projects to build seed production capacity with the seed companies that remained in South Sudan after the civil war of 2016; however, these projects are at a nascent stage, and the results are yet to be seen.

Most imported seeds are sold to NGOs, which often require that seed companies acquire proof of certification from the Ministry of Agriculture. The Ministry of Agriculture does not have functional laboratories to test the seed samples, thus inspection entails verifying that the seed is certified in the country of origin through verification of labels or certificates (i.e., issuance of certificate from public authorities). The ministry also carries out field inspections together with the Bureau of Standards. Inspectors lack facilities to carry out their inspections and can, therefore, only verify expiration dates of seeds and the source of imports. The lack of quality standards, infrastructure, and procedures for verification of seed dealers has caused high levels of counterfeited seeds.

Stakeholders have reported that there are no standard fees for inspection, meaning that payment is based on the bargaining power of the applicant. Moreover, they have reported that often inspectors will issue fines, regardless of whether the seeds comply with the certification and expiration dates.

Stakeholders also noted that the price of improved seed in South Sudan is prohibitively high, often double the price in neighboring countries. Seed companies reported that the high prices are due to the many taxes and fees imposed on improved seeds, which total over 21 different types of taxes including national, state, and county taxes. Moreover, the taxes are not standardized, and most companies are not certain of how taxes are assessed and imposed. Finally, companies reported that lack of coordination among departments of the MAFS, along with insufficient resources, have been a main challenge to the growth of the seed sector.

The EAC Seed Bill establishes a certification process for seeds to be traded within the region. In this sense, it requires that Partner States designate official testing laboratories and issue

certificates, labels, and seals. According to companies consulted, South Sudan would not be capable of adopting the certification process set out in the EAC Seed Bill. However, harmonization and recognition of certified labels from other countries in the region could be a step towards implementation of a formal and effective certification process. It should be noted, nevertheless, that lack of funds remains a major issue for the development of any of the functions of public authorities in South Sudan related to seed systems.

There are no specific legal requirements or streamlined processes for the importation of seed in South Sudan. Practices are inconsistent and often depend on the importer's bargaining power. Most importers import seed informally in small quantities on buses.

Importers can work formally by applying for an import permit before the Department of Plant Protection under the Ministry of Agriculture. This application takes only a few minutes. Once an import permit is issued, the applicant can request the source of seed for seed consignment. As mentioned in the certification process, the seed should be certified in its country of origin and be accompanied by a phytosanitary certificate from the country of origin.

Ordinarily, most countries require that seed be subjected to testing at the border to verify compliance with standards. However, South Sudan does not have a formal procedure, and, hence, no testing is done. Although there are some laboratories with the necessary equipment, they are not functioning due to lack of technical personnel and limited financial resources. If an importer were to obtain a certification for imported seed, it has to declare the seed before the Ministry of Agriculture and take the samples for inspection. There is not a standard price for testing, which can take three days, and once again everything depends on the bargaining power of the importer. An importing company's decision to declare seed and obtain certification from the Ministry of Agriculture will depend on who the final consumer is. As mentioned above, NGOs usually require proof from the Ministry of Agriculture that seed is certified, while certification is often not required if the final buyer is a farmer.

Harmonization under the EAC Seed Bill will rely upon implementation of good practices by the Partner States, such as conducting border post controls, adopting pest risk analysis procedures according to international standards, maintaining and updating national quarantine and non-quarantine pest lists for seed, and adopting the EAC quarantine and regulated non-quarantine pest lists for seed. South Sudan does not have control posts at the border, laboratories, a formal procedure for certification, or pest lists, yet these steps would be needed for successful implementation of the EAC Seed Bill. As mentioned above, the EAC Seed Bill could help streamline and simplify some of the border controls, which could facilitate cross border trade, provided that national systems could be developed in support.

South Sudan does not have any legislation on PBRs or PVP. Under the Variety Release Guidelines, there are two types of released varieties:

- Publicly release varieties, which can be given to a seed grower without requirement to pay a research or royalty fee, and
- Protected public release, which are inherently protected with a PVP title at their release and registration.

The Variety Release Guidelines require any seed grower to pay a research or royalty fee in order to use varieties, depending upon whether the user is granted an exclusive or non-exclusive license. According to the Variety Release Guidelines, the following research or royalty fees are collected on all certified seed sold of protected public release varieties:

- Fee for costs associated with PVP and fees (administrative crop improvement);
- 50 percent of net to breeding program that developed the variety generating the research fees; and
- 50 percent of net to fund high priority programs for variety improvement, cereal grain legume quality, and food security focused outreaches.

Seed companies noted that they were unaware of the existence of such provisions.

The EAC Seed Bill includes the protection of Plant Breeders Rights, based on UPOV. In particular, the EAC Seed Bill takes vocabulary and procedures from UPOV 1991. Harmonization of PBR and PVP under the EAC Seed Bill could help to preserve rights on protected varieties, expand knowledge on PBR and PVP, and render protection more enforceable.

South Sudan's Regulatory Framework for Fertilizer

South Sudan does not yet regulate fertilizer. There is no policy, law, or regulation that governs registration, licensing, and the trade or use of fertilizer. This has had consequences for the way South Sudan's market operates and the use of fertilizer in general. Fertilizer use in South Sudan is still very minimal, and a very large percentage of farmers and other stakeholders believe that the soil has enough nutrients and that the use of fertilizer is unnecessary. Fertilizers that are in the market are imported and are not subject to any form of testing, which has resulted in the sale of substandard, counterfeit, and sometimes expired fertilizers.

Relevant standards for fertilizer do not yet exist in South Sudan, and examination of fertilizers is only possible through physical inspection at the border and in agro-dealer shops, with checking mainly for expiration dates. However, as mentioned above, this is not a uniform practice, and authorities face the same constraints for inspections as noted with respect to seeds, meaning lack of laboratories, inspectors, and resources to carry on with these procedures.

Expected Impact (Costs) Accruing to Government of South Sudan as a Result of EAC Harmonized Seed Bill

- South Sudan does not yet have a regulatory system for seed in place, and developing and implementing a system will give rise to some costs (although benefits will also result);
- Certification procedures, accreditation of laboratories and inspectors, and effective implementation of PVP will need to be developed;

- South Sudan is not yet a member of ISTA and should consider membership, which will result in costs for equipping the national testing seed laboratory;
- Implementation of quarantine and non-quarantine pest lists as established by the EAC Seed Bill;
- Increased availability of extension services to smallholder farmers to enhance their knowledge on the use of improved seed varieties;
- Strengthened capacity of local seed producers to produce and process certified seed;
- Measures to improve quality control among seed producers, including registering all seed producers and packaging all seed;
- Increases in seed prices for smallholder farmers due higher costs of production as a result of implementation of the EAC Seed Bill; and
- Because South Sudan does not yet have a regulatory system in place, there will be costs when neighboring countries do not extend mutual recognition.

Expected Impact (Benefits) Accruing to Government of South Sudan as a Result of EAC Harmonized Seed Bill

- Small farmers will benefit from access to wider variety of quality seeds in the local market;
- Increased revenues from import duties, since companies from other EAC Partner States will be able to supply seed to South Sudan with greater ease;
- Increased revenue from VAT and charges on variety release and certification processes with the expected increase in the number of seed breeders, producers, and agro-dealers;
- Increased export earnings from varieties exported to the EAC Partner States; and
- Savings from reduced importation of seeds due to harmonization and improved functioning of the seed sector, enabling companies and producers can sufficiently produce for the local demand.

Expected Impact (Costs) Accruing to Government of South Sudan as a Result of EAC Harmonized Fertilizer Bill

- South Sudan does not yet have a comprehensive fertilizer regulatory system; therefore, the government is expected to incur expenditures with respect to developing the regulatory system to meet the required standards of the harmonized fertilizer bill;
- Lack of funds and resources are major challenges for the development of South Sudan's regulatory system for fertilizers;
- Costs for capacity building in terms of training, accrediting, registering, and monitoring agro-dealers in charge of distribution of fertilizers in South Sudan;
- Capacity building at both the farmer and agro-dealer levels will need to build awareness of fertilizer use and suitability;
- Capacity building will also be needed to equip fertilizer testing laboratories with sufficient equipment and human resource (inspectors); and
- Facilitation of fertilizer companies to implement labelling and packaging requirements.

Expected Impact (Benefits) Accruing to Government of South Sudan as a Result of EAC Harmonized Fertilizer Bill

- Harmonization of fertilizers could overcome some of the challenges noted by stakeholders by establishing a common system, building capacity, streamlining procedures, and sharing information among EAC Partner States;

- Harmonized testing and standards for fertilizer at the regional level would also help increase availability of fertilizer in South Sudan, which relies on imports; and

- Removal of border restrictions and alignment of structures with other regions should help facilitate regional trade, improve food security, and increased revenue to stakeholders.

Economic Analysis of the Impact of Harmonized Seed Bill

Originally the economic assessment proposed was meant to follow an integrated investment appraisal (IIA) approach. This approach measures the benefits and costs in financial and economic terms, which helps to identify, quantify, and allocate costs and benefits to the appropriate stakeholders. However, the data gathered through the field visit and desk research was insufficient to run the analysis following the IIA methodology. Consequently, an alternative approach will be followed which requires less detailed data but still results in in an estimate of economic impact of the proposed harmonized rules on Partner States. Due to the lack of primary data on fertilizer, the estimates on fertilizer rely mostly on secondary data.

The Spatial Equilibrium Model (SEM) used analyses the impact of a policy change on the welfare of affected stakeholders. It comprises *n* regions or countries, separated by distance. This economic model is commonly used to determine the economic impact of trade policy changes on the quantities, prices, and welfare that accrue to the relevant stakeholders.[63] This, in turn, helps to weight the benefits and costs of a particular policy change. It is calibrated to the price and quantity values for the particular base year using demand and supply elasticity estimates.

The model consists of 3 equations: (1) demand, (2) supply, and (3) welfare functional equations. The welfare function is then integrated with its optimality conditions as well as the market clearing equation. The General Algebraic Modeling Systems (GAMS) will be used to solve the mathematic problem. The demand and supply functions are specified as:

$$y_s = \alpha_i p_i^s + \delta_i \text{ i=1 ...n} \quad (1)$$

$$y_i = \beta_i p_i^d + \theta_i \text{ i=1 ....n.} \quad (2)$$

Where α, β are own price coefficients δ and θ are the additive constants, p^d is regional demand price, y_i is quantity demand, p_i^s is regional supply price, y_s is the quantity supplied in the i^{th} region.

[63] Devadoss, S., Aguiar, A.H., Shook, S.R., Araji, J., 2005. A Spatial Equilibrium Analysis of U.S.–Canadian Disputes on the World Softwood Lumber Market. Canadian Journal of Agricultural Economics 53 (2005) 177–192.

The two functions specified above are then incorporated into the SEM to provide the welfare objective function together with the market clearing conditions algebraically as:

$$\sum_{i=1}^{n}(a_i - b_i y_i)y_i - \sum_{i=1}^{n}(c_i + d_i x_i)x_i - \sum_{ij} x_{ij} t_{ij} - \sum_{ij} x_{ij}(p_j^d - p_i^s) + \sum_{ij} x_{ij}(p_j^d \frac{1}{1+\delta_{ij}} - p_i^s) \ldots (3)$$

Subject to:

$$\sum_{j=i}^{n} x_{ij} \leq X \text{ For all I} \quad (4)$$

$$\sum_{j=i}^{n} x_i \geq y_i \text{ For all j} \quad (5)$$

$$c_i + d_i x \geq p_i^s \text{ For all I} \quad (6)$$

$$a_i - b_i y_i \leq p_i^d \text{ For all I} \quad (7)$$

$$(1 + \delta_{ij})(p_i^s + t_{ij}) \geq Q_j^d \text{ For all I and j} \quad (8)$$

$$y_i, x_j, \delta_j \geq 0 \text{ For all I and j} \quad (9)$$

Where x_{ij} is the quantity of a commodity (maize seed, or DAP, NPK 17:17:17, and Urea for fertilizer) that is being transported from country i, to country j, t_{ij} is the unitary transportation cost from I, to j, y_i is the quantity demanded in country i, δ_{ij} is the import tariff imposed by region j, on imports from country i, p_i^d is country demand price and p_i^s is the country supply price. This model adopts a nonlinear optimization technique to maximize the set of linear constraints in equations 4 to 9. Ideally equation 4 implies that the total quantity of a commodity transported from country i, must be lower or equal to national production in that country. Similarly, equation 5 implies that the total quantity of maize seed transported into the country must be greater than or equal to quantity demanded in the destination country. Equation 6 then implies that the regional supply price must be greater than or equal to the specific country supply price. Equation 7 is the same as equation 6, although it relates to demand and implies that regional and national demand prices must be equal if the national demand is positive. Equation 8 is a market clearing condition showing that the market supply price in country i, together with the transportation cost adjusted for harmonization, must be greater than or equal to market demand price in country j. The last constraint shows that the demand, supply and transported quantities are not negative.

Calibrating the Model for Seed

Maize, a crop that is generally produced and traded within the EAC region, is used to calibrate the model and measure the welfare impacts accruing to Partner States as a result of the proposed EAC Seed Bill. Maize is also a commodity where significant data is available for three Partner States, namely Uganda, Kenya, and Tanzania. Using a staple crop like maize will also generate representative results for the expected benefits and costs of adopting the EAC Seed Bill in the region. The model consists of four equations: (1) price, (2) supply, (3) consumption, and (4) market clearing identities for maize seed at the retail level. The GAMS software package is used to solve the equations.

The current model uses 2018 as a base year (without scenario) for seed and 2017 for fertilizer, and, as stated above, the model was run for three countries (Kenya, Uganda, and Tanzania), given that these were the only countries where sufficient data was shared and otherwise available. The relevant quantities, their corresponding prices, and their respective price elasticities are then compiled to solve the mathematical problem. Table 3 below summarizes this information.

Table 3: Base Values for Model Calibration

Variable	Countries		
Distances (KM)	**Kenya**	**Uganda**	**Tanzania**
Kenya	0	673	922
Uganda	673	0	1595
Tanzania	922	1595	0
Price Elasticity of demand for maize seed	-1.5	-1.0	-0.90
Price Elasticity of Supply of maize seed	0.63	0.43	0.66

Additional information from secondary sources is used for Uganda[64], Kenya[65] and Tanzania[66] respectively. However since the data is an aggregate estimate, there is a higher error margin. The own-price elasticities of supply for seed maize in Kenya, Uganda, and Tanzania are set at 0.63, 0.43, and 0.66 respectively, while the price elasticities of demand are set at - 1.50, - 0.15, and - 0.90 respectively. The distances represent the distances between the three EAC capitals in question: Nairobi, Kampala, and Dar es Salaam. The elasticities used to run the model are those used in other studies particular to Kenya,[67] Uganda,[68] and Tanzania.[69] The analysis accounts for transfer costs across the three selected countries and compares a scenario before, and an estimate following, implementation of seed policy harmonization in order to measure the possible policy impact.

The welfare impacts of the harmonized seed policy are quantified from a SEM of the seed maize trade in Kenya, Uganda, and Tanzania. The base values are taken for the year 2018

[64] Mabaya. E, Mugoya M, Mubangizi E, & Ibyisintabyo C, (2018). Uganda Brief 2018. The African Seed Index; and Kephis (2019). Kephis Annual report and Financial Statement for the year ended 30 June, 2018.
[65] Kephis (2019). Kephis Annual report and Financial Statement for the year ended 30 June, 2018.
[66] Edward Mbaya, Filbert Mzee, Alphonce Temu, and Mainza Mugoya, *Tanzania Brief 2017 - The African Seed Access Index*,
[67] Olwande. J, Ngigi. M, Nguyo. W. "Supply Responsiveness of Maize Farmers in Kenya: A Farm-Level Analysis, " Paper prepared for presentation at the 27th International Association of Agricultural Economists' 2009 Conference, Beijing, China, August 16-22, 2009.
[68] Sserunkuuma, D., "The adoption and impact of improved maize varieties in Uganda," Paper
Prepared for the Symposium on Green Revolution in Asia and its Transferability in Africa held on December 8-10, 2009 in Tokyo, Japan
[69] Weliwita, A., Nyange, D., Tsujii, H., "Food demand patterns in Tanzania: A Censored regression analysis of microdata," Sri Lankan Journal of Agricultural Economics, 5: (1) 9 –34, 2003.

following the annual reports from TASAI briefs for Kenya[70] and Uganda,[71] KEPHIS report (2018) for Kenya,[72] and TASAI annual brief for Tanzania,[73] among other relevant secondary sources. The CPI indices are derived from the World Bank inflation and CPI datasets[74], and an average of the last three years across all countries was considered Discounting factors are considered for at least two years at a rate of 12 percent following the Asian Development Bank recommendation on the best discounting rate to adopt while conducting cost-benefit analysis for development projects in developing countries.[75] A before and after comparative analysis is undertaken using 2018 price and quantity values as the base scenario before the implementation of the harmonized regulations and a period of two years ahead as the scenario (assumed) after the regulations have been harmonized and implemented.

Table 4: Before Scenario Policy Results from the Base Values

Variable	Kenya	Uganda	Tanzania
Retail Prices (USD/MT)	2,000	1,500	2,200
Quantity Demanded	7,821	4,477	6,684
Quantity Supplied	37,800	23,959	17,426
Quantity Traded ('000 MT)			
Kenya	37,800	11,264	14,629
Uganda	0	23,959	1,395
Tanzania	0	0	17,426
Consumer Surplus (USD/Million)	12.02	13.6	1.32
Producer Surplus (USD/Million)	18.36	12.14	10.1
Social Surplus (USD/Million)	30.39	26.02	11.39

Table 4 reveals the existing trade patterns: seed maize retail prices are higher in Tanzania than in Kenya and Uganda respectively. The base scenario analysis provides positive welfare impacts for seed maize trade in the three selected EAC countries. From the table, the base level results reveal that consumer surpluses of US$ 12.02, US$ 13.6, and US$ 1.32 million are generated in Kenya, Uganda, and Tanzania, respectively.

[70] Michael Waithaka, John Mburu, Mainza Mugoya, Krisztina Tihanyi. 2019. *Kenya Brief 2018 - The African Seed Access Index.* Available at: tasai.org/publications.

[71] Edward Mabaya, Mainza Mugoya, Emmanuel Mubangizi and Chris Ibyisintabyo. 2018. *Uganda Brief 2018 - The African Seed Access Index.* Available at: tasai.org/publications.

[72] KEPHIS, "Annual Report and Financial Statements for the Year Ended 30th June 2018," KEPHIS, 2019, available at: https://www.kephis.org/images/docs/annualreportkephis2018finalonlineversion.pdf.

[73] Edward Mabaya, Filbert Mzee, Alphonce Temu, and Mainza Mugoya. 2017. Revised 2019. *Tanzania Brief 2017 - The African Seed Access Index*. Available at: tasai.org/publications.

[74] Consumer price index (2010 = 100). Extracted from https://data.worldbank.org/indicator/FP.CPI.TOTL

[75] Asian Development Bank (2013) Asian Development: Cost-Benefit Analysis for Development: A Practical Guide. Mandaluyong City, Phillipines: Asian Development Bank, 2013. ISBN 978-92-9092-957-4 (Print), 978-92-9092-958-1 (PDF). Publication Stock No. TIM125320-2

Similarly, producer surpluses of US$ 18.36, US$ 12.14, and US$ 10.1 million are generated in Kenya, Uganda, and Tanzania, respectively. In fact the combined social net surplus in Kenya, Uganda, and Tanzania amounts to US$ 30.39 million, US$ 26.02 million, and US$ 11.39 million, respectively.

Relative to the base solution values of 2018, the harmonized seed policies and regulations as represented in Table 4 after implementation reveal a projected increase in seed maize prices across all the three selected countries. It is evidenced that in Kenya, prices increased by 9 percent after seed policy harmonization; while in Uganda they increased by 10.4 percent and in Tanzania increased by 15.5 percent.

In fact, on average, seed maize prices in the region are projected to increase by about 12 percent after harmonizing seed policies, which is anticipated to bring a substantial increase in seed maize production in Kenya by 54 percent, in Uganda by 56 percent, and in Tanzania 0.25 percent. This observation can partly be explained by the fact that countries with more capacity would endeavor to take advantage of an expanded market and reduced barriers in the regional market.

Table 5: Comparative Results to Generate a Case for (or Against) the EAC Seed Bill

Variable	Kenya	Uganda	Tanzania
Retail Prices (USD/MT)	2,180.00	1,710	2,541
	9.0%	10.4%	15.5%
Quantity Demanded	2,573	6,563	8,669
	33.0%	47.0%	30.0%
Quantity Supplied	58,174	37,410	17,862
	54.0%	56.0%	0.25%
Quantity Traded ('000 MT)			
Kenya	56,469	11,974	14,945
	49.3%	0.63%	2.2%
Uganda	0	33,136	1,814
	0.0%	47.00%	30.0%
Tanzania	0	0	17,862
	0.0%	0.00%	0.25%
Consumer Surplus (USD/Million)	14.04	19.4	2.40
	17%	68%	85.00%
Producer Surplus (USD/Million)	28.8	18.57	16.8
	57.0%	50.00%	66.00%
Social Surplus (USD/Million)	42.84	38.01	19.17
	45.0%	62.00%	37.00%

However, compared to Kenya and Uganda, seed production in Tanzania is projected to increase at a slower rate than regional counterparts after harmonization of seed policies. The lower seed production in Tanzania can be offset by increased imports from both Kenya and

Uganda. The results of the model also show that Kenya's seed local maize sales will increase considerably more as opposed to those from Uganda and Tanzania. Uganda's exports are lower than those from Tanzania, possibly due to anticipated lower prices in Uganda (increasing just by 0.63 percent) compared to 2.2 percent in Tanzania. Consequently, it will be more advantageous for Kenya to sell more seed locally and to Tanzania than to Uganda.

The results also show that the harmonization of seed policies is likely to increase consumer surplus in all the selected EAC countries by 17 percent, 68 percent, and 85 percent respectively in Kenya, Uganda, and Tanzania. Similarly, producer surplus for seed maize growers in all the countries is anticipated to increase by 57 percent, 50 percent, and 66 percent in Kenya, Uganda, and Tanzania, respectively. **Overall, the implementation of the harmonized seed rules is anticipated to lead to a net social benefit/surplus across Partner States by 45, 62, and 37 percent respectively in Kenya, Uganda, and Tanzania.** This will translate into a total welfare gain of USD 100.2 million across all the selected countries in the region.

Considering the fact that the three countries account for about only 65 percent of the region's seed maize industry, including Rwanda, Burundi, and South Sudan, it is anticipated that the region's net social benefit can be estimated at USD 145 million. This, therefore, implies that harmonizing seed policies and regulations across the region is likely to lead to improvements in welfare across the Partner States. Comparatively, seed producers in Kenya and Uganda are anticipated to be the greatest beneficiaries of the change in policy, while those in Tanzania seem to benefit at the periphery. This can partly be explained by comparing qualitative factors and distances across the 3 cities; Dar es Salaam is relatively farther from Nairobi and Kampala as opposed to the distance between Kampala and Nairobi. However, it is also anticipated that most who gain from harmonization will potentially compensate others through improved trade. Therefore, considering the compensation principle in trade theory, the proposed EAC Seed Act is recommended as a potentially welfare enhancing policy, and, therefore, regional policymakers should fast track implementation of the harmonized seed policies and regulations.

It is important to note at this point that significant efforts were made to collect data from all the EAC Partner States and from the EAC Secretariat. However, it was not possible to get information on Rwanda, Burundi, and South Sudan needed to run the economic model described above.

Calibrating the Model for Fertilizer

The same economic model was used to calculate the welfare impact that the harmonization of fertilizer regulations would have in the EAC Partner States. Necessary data to run the SEM of fertilizer trade in Kenya, Uganda, Tanzania, Rwanda, and Burundi was collected through secondary sources. There was no available data for South Sudan either from primary or secondary sources; consequently the model was not applied to South Sudan. The main source of data used in this part of the economic analysis has been published by

Africafertilizer.org, an initiative that encourages and coordinates partnerships and data-sharing mechanisms that provide information of fertilizer statistics, (such as production, trade, consumption, prices, production capacities, and fertilizer use per crop) and fertilizer market intelligence.[76] The data used for this analysis mainly captures information on the three major fertilizer products consumed in the EAC countries: DAP, NPK 17:17:17, and urea. An average of the annual price for each of these fertilizers is used as price input for the model. Data from 2017 was used, since information for 2018 had not been published at the time the assessment was run. The prices used for Burundi were provided for by the Ministry of Agriculture.

The GAMS package was used to solve the equations. As explained above, this model consists of three main equations namely price, supply, and consumption. To solve the model, estimates were compiled for the quantities of the fertilizer products that were supplied and consumed in the relevant Partner States of EAC together with their corresponding retail prices and their price elasticities.

[76] https://africafertilizer.org/ Africa Fertilizer website, 2019. Accessed on 24 September, 2019.

Table 6: Base Values for Model Calibration

Variable	Countries				
Distances (KM)	Kenya	Uganda	Tanzania	Rwanda	Burundi
Kenya	0	673	922	1,174.2	1,389.8
Uganda	673	0	1595	517	712.6
Tanzania	922	1595	0	1,430.4	1,479.2
Rwanda	1,174.2	517	1,430.4	0	290.7
Burundi	1,389.8	712.6	1,479.2	290.7	0
Price Elasticity of demand	-1.72	-1.22	-1.03	-1.32	-1.55
Price Elasticity of Supply	0.91	0.53	0.76	0.54	0.50

Table 6 above summarizes the distance between capital cities in the EAC Partner States and the price elasticities of demand and supply for fertilizer. The price elasticities of fertilizer supply used for Kenya is 0.91, Uganda is 0.53, Tanzania is 0.76, Rwanda is 0.54, and Burundi is 0.50. They reflect the responsiveness of the suppliers towards the amount of fertilizers supplied as a result of a percentage increase in the levels of the prices over a given period of time. The distances used is the distance between the five capital cities of the five EAC Partner States, namely Nairobi, Kampala, Dar es Salaam, Kigali, and Bujumbura.

Table 7: Before Policy Results from the Base Values

Variable	Kenya	Uganda	Tanzania	Rwanda	Burundi
Retail Prices (USD/MT)	558	657	493	484	660
Quantity Demanded	802,414	66,333	349,492	57,899	50,127
Quantity Supplied	913,304	67,060	523,988	57,939	50,127
Quantity Traded ('000 MT)					
Kenya	801,788	41,097	0	5,173	7,489
Uganda	0	66,332	0	0	0
Tanzania	0	0	348,968	0	0
Rwanda	0	0	0	57,899	0
Burundi	0	0	0	0	50,127
Consumer Surplus (USD/Million)	4.98	3.6	3.32	2.11	1.08
Producer Surplus (USD/Million)	1.4	1.06	1.1	0.89	0.7
Social Surplus (USD/Million)	6.2	4.66	4.42	3.00	1.78

A proxy for the amount of fertilizer supplied was constructed by adding the local production of fertilizer, the imports of fertilizer, and exports, respectively, whereas the quantity for fertilizer demand was that of apparent consumption in the five Partner States in 2017.

The welfare analysis of an improved fertilizer policy environment is quantified from a SEM model of the fertilizer trade in Kenya, Uganda, Tanzania, Rwanda, and Burundi, respectively. A before and after comparative analysis is undertaken using 2017 price and quantity values as the base scenario before the implementation of the harmonization agenda and a discount rate of 12 percent considering 3 years (2018, 2019, and 2020) is adopted as the scenario after the implementation of the policies. Like the maize seed analysis, this particular analysis also adopts the World Bank inflation data to adjust for any possible inflationary tendencies that might accrue to the economies during the three-year period that is being considered. An average CPI index has been considered across all the countries under this study to help normalize the prices. To that extent, the results of the base scenario replicate the existing trade patterns among the five Partner States.

After running the model, the results reveal that the base scenario generates positive welfare impacts for fertilizer trade in the five countries. At the base solution, a positive producer and consumer surplus is being generated across all countries. Overall, the combined social net benefit in **Kenya is $6.2 million USD, Uganda is $ 4.66 million USD, Tanzania is $4.42 million USD, Rwanda is $3.00 million USD, and Burundi is $1.78 Million USD, respectively**. Table 8 below summarizes the results of the model.

Table 8: Comparative Results to Generate a Case for (Against) the Bill

Variable	Kenya	Uganda	Tanzania	Rwanda	Burundi
Retail Prices (USD/MT)	597	693	519	513	720
	6.50%	5.21%	5.08%	5.65%	8.30
Quantity Demanded	858,883	78,307	364437	67,750	56142
	6.57%	15.29%	4.10%	14.54%	10.71%
Quantity Supplied	919,319	123,529	533,839	69913	65072
	0.65%	45.7%	1.84%	17.13%	22.96%
Quantity Traded ('000 MT)					
Kenya	1,018,271	47,220	0	5,799	7953
	21.3%	12.96%	0.0%	10.79%	5.83%
Uganda	0	80925	0	0	0
	0.0%	18.03%	0.0%	0.0%	0.0%
Tanzania	0	0	460638	0	0
	0.0%	0.00%	23%	0.0%	0.0%
Rwanda	0	0	0	69,305	0
	0.0%	0.0%	0.0%	16.4%	0.0%
Burundi	0	0	0	0	57646
	0.0%	0.0%	0.0%	0.0%	13.04%
Consumer Surplus (USD/Million)	6.32	4.392	4.11	2.42	0.91

	21.25%	18.03%	19.35%	12.95	23.07%
Producer Surplus (USD/Million)	1.778	1.293	1.452	1.065	0.805
	21.2%	18.03%	24.24%	16.45%	13.04%
Social Surplus (USD/Million)	8.098	5.685	5.562	3.485	1.715
	56.64%	54.95%	55.72%	50.00	50.00

Considering the 2017 base scenario values, the harmonized fertilizer policy and bill, as represented by the scenario after the implementation of the policy, leads to an increase in the average fertilizer prices across all five countries under consideration. It is evidenced that in Kenya, for instance, average prices increased by 6.5 percent, while in Uganda average prices increased by 5.21 percent, and in Tanzania average prices increased by 5.08. Similarly, average fertilizer prices increased by 5.65 percent and 8.30 percent in Rwanda and Burundi, respectively. This observation could be explained by the relative inflation rates in the countries under consideration. An additional factor to consider when accounting for the increase in prices is the increase in demand for fertilizers by the smallholder, which is likely to push up prices, especially in the short-term due to initiatives that involve farmer sensitization and awareness campaigns. Therefore, much as the average fertilizer prices increase, their respective demand proportionally increased in all countries, which was also followed by an increase in the amount of fertilizers supplied. The increase in supply can be attributed to increased market access to fertilizers by the smallholder farmers in the region after the harmonization of fertilizer policies and regulations.

The harmonized fertilizer policy environment in the region is likely to result in substantial expansion of fertilizer production in all the countries as evidenced by the positive percentage increment. In fact, **Uganda is likely to be stimulated to increase its fertilizer production potential** by **45 percent, which is more than any other Partner State, followed by Rwanda at 22 percent, and Burundi at 17 percent**. However, these high percentage increases in production in Uganda, Rwanda, and Burundi might be due to the fact that these countries' current production potential is low and thus more sensitive to any slight stimulus. Consequently, harmonization would have significant relative returns. Countries which have some production already, are likely to concentrate on first satisfying their local market before they start exporting fertilizer products to their counterparts. This is a possible explanation of why the model shows that Uganda, Rwanda, Burundi, and Tanzania will not immediately increase their level of exports after harmonization. Kenya is slightly different, and, according to the model would start exporting more fertilizer immediately after harmonization.

Overall, the implementation of the harmonized fertilizer policies leads to a well distributed incremental social net benefit among the Partner States. **On average, a net social benefit of 53.4 percent is shared and realized by all the Partner States under consideration.**

It is also revealed that Kenya, Uganda, and Tanzania are likely to benefit slightly more in the short run, namely **$8.098 million USD for Kenya, $ 5.562 million USD for Uganda, and 5.562 million USD for Tanzania** as compared **to $3.485 million USD for Rwanda and $ 1.715 million USD for Burundi**. As mentioned above, this can partly be explained by the fact that the latter two economies are still nascent in their production capacities but with harmonization this capacity is expected to increase. This analysis, therefore, seems to suggest that the harmonization of fertilizer policies and regulation within the EAC region would lead to improvements in welfare of the Partner States.

Section II: Good Practices in Seed Regulation and Regional Comparative Assessment

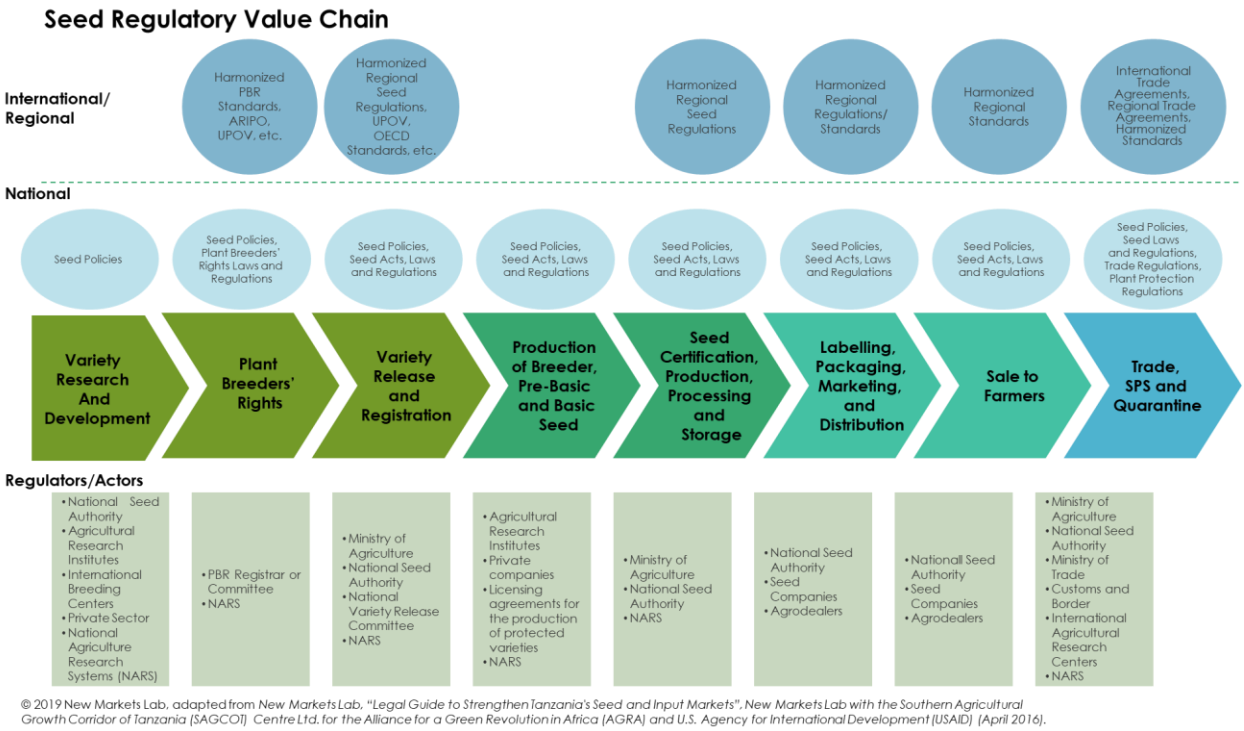
Figure 2: Good Regulatory Practices in the Seed Sector

Source: © 2019 New Markets Lab

Seed laws and regulations at the national, regional, and international levels often follow a set of good practices, all of which are evident in the EAC Seed Bill and, to varying degrees, Partner Countries' seed regulatory systems. Understanding these good practices will be important to implementation of the EAC Seed Bill. In addition, a comparative assessment of the EAC Seed Bill and the seed harmonization efforts of COMESA, SADC, and ECOWAS will also be instrumental for implementation within the EAC and broader regional harmonization.

As noted above, the harmonized seed regulations of the EAC, SADC, COMESA, and ECOWAS share similarities. For example, the four regulatory frameworks cover the processes for evaluation, release, and registration of seed and the creation of regional catalogues that are administered by authorized regional bodies. COMESA and SADC have implemented and operationalized regional seed catalogues, and varieties can be entered into these regional catalogues once released in two Member States, based on relevant criteria. The COMESA and SADC catalogues are becoming increasingly used, but they have also encountered procedural and institutional challenges, particularly when they were first rolled out, which highlights some important implementation issues that could help guide the EAC regional harmonization process. Regional regulations also establish obligations regarding seed certification and quality assurance, and for all four focus RECs international standards, such as ISTA rules and OECD Seed Schemes are incorporated by reference. Even though these similarities will help streamline the implementation of the EAC Seed Bill, once adopted, the substantive and institutional commitments in the EAC Seed Bill will differ slightly from those in the other RECs, for example with regard to some aspects of variety release and registration and pest list management requirements. These will be addressed in greater detail in this section.

In general terms, regional regulations cover the elements of the seed value chain described in Figure 3:



The different schemes for regional regulatory harmonization cover a number of these regulatory elements, but it should be noted that the level of detail in regulations varies significantly across the four focus RECs. The EAC Seed Bill is intended to regulate seed systems in an overarching way, leaving many details to be addressed through forthcoming regulations. The SADC and COMESA regulations provide more detail in terms of the regional variety release process and administration of the regional catalogues, the classes of seed to be covered by the regulations, the type of certificates and documents issued by NPPOs, and testing and labeling requirements. The ECOWAS 2008 Seed Regulations are by far the most detailed seed rules in the continent and include detailed obligations for all aspects of the seed value chain, from variety release and registration to production and storage conditions. Other relevant regulations in ECOWAS include the Draft Implementing Regulation Relating to the Organization of the West African Catalogue of Plants Species and Varieties, the Draft Implementing Regulation Relating to the Technical Agreements Annexes Defining to the Modalities for Seed Certification and Quality Control of Seed in the ECOWAS Region, and the Enabling Regulation 01/06/12 Relating to the Roles, Organization and Functioning of the West African Vegetable Seed and Seedling Committee of the Community. These differences and similarities will be assessed in more detail below.

As stated in the EAC Seed Bill's long title, the Act provides for the coordination of evaluation, release, and registration of plant varieties between Partner States; common processes for seed certification and protection of plant varieties within the Community; and other related matters.[77] In Part II, the EAC Seed Bill establishes the creation of a committee in charge of

[77] East African Community Seed and Plant Varieties Bill (EAC Seed Bill), 2018.

coordinating seed matters in the region. Among its activities, the EAC Seed and Plant Variety Committee shall recommend to the Council the laboratories which may be designated to test and certify plant varieties, recommend to the Council any new classes of seed or categories of crops required to be certified, review the inspection and seed testing procedures and standards in the Community, approve plant varieties to be included in the Community Plant Variety Catalogue, and consider any application from a Partner State seeking to restrict the marketing of a certified plant variety in its territory and make recommendations to the Council, among other things.[78] Moreover, the EAC Seed Bill requires that Partner States designate NSAs to facilitate cooperation on seed production among Partner States, enforce seed quality standards, appoint inspectors, receive variety test results, provide regional seals and labels, and issue test certificates and import and export permits, among others.[79]

Dedicated National Seed Authority

Effective regional harmonization requires close coordination between national governmental agencies and regional governmental bodies. Most of the regional harmonization rules mandate that member countries designate NSAs to act as the supervisors and overseers of the seed system at the national level as well as serve as the point of contact with the relevant regional body and actively participate in the implementation of regional rules. Similarly, regional rules generally create regional governmental bodies in charge of administering and managing the regional harmonization process. All four focus RECs incorporate and regulate these administrative bodies to a different degree.

In Part II, the EAC Seed Bill establishes the EAC Seed and Plant Variety Committee to coordinate all seed matters, including the activities noted above. Absent regulations, it is not entirely clear how the EAC Seed and Plant Variety Committee and NSAs will interact, and this will be an important aspect that will impact the successful implementation of the regional legal framework.

Both COMESA and SADC have similar structures in place. For COMESA, the COMESA Seed Trade Regulations create the Seed Coordination Unit and the COMESA Seed Committee in charge of coordinating all activities related to the administration and operation of the harmonized system and overseeing the implementation of the system as a whole. The SADC Seed MOU also establishes the SADC Seed Committee to provide policy direction and guidance and the SADC Seed Security Network Project/SADC Seed Centre to establish and maintain the SADC Variety Catalogue and Database, assess and develop capacities of NSAs and NPPOs, and maintain records for seed testing laboratories designated by Member States.

[78] East African Community Seed and Plant Varieties Bill (EAC Seed Bill), 2018.
[79] East African Community Seed and Plant Varieties Bill (EAC Seed Bill), 2018.

Most RECs call for designated NSAs and NPPOs (ECOWAS does not include provisions that mandate the designation of NSAs or NPPOs expressly, but their involvement in the different regulatory areas is implied throughout the text of the regulation.), and it is important that these bodies cooperate and mutually recognize each other's processes and data to guarantee that the regional processes are properly implemented. During field consultations, most public stakeholders recognized that there is currently a lack of trust and recognition of data from other countries' NSAs and NPPOs, and this will need to be improved in order for the EAC Seed Bill to be successfully implemented.

Ensuring that regional institutional bodies are in place and fully operational is also essential for a functional harmonized seed regulatory system. The funding and operation of the EAC Seed and Plant Variety Committee was a concern raised among different stakeholders consulted for this project.[80] As experience has shown, regional administrative bodies need to have sufficient and sustainable funding to guarantee the smooth operation of the regional system.

The different RECs have launched initiatives to help implement regional rules and streamline coordination among the national institutions. In the case of COMESA, for instance, the COMESA Seed Harmonization Implementation Plan (COMSHIP) was launched with the objective of achieving full implementation of the COMESA Regulations by 2020-2022.[81] West and Central African Council for Agricultural Research (CORAF) provides national-level implementation support through the Alliance for Commodity Trade in Eastern and Southern Africa (ACTESA) and publishes annual regional reviews of the implementation status within COMESA Member Countries.[82] COMSHIP also includes a program on PVP[83] and facilitates the Regional Agro-Inputs Programme (COMRAP).[84] As of February 2019, COMSHIP had been launched in 18 of the COMESA Member States.[85] Similarly, in West Africa, CORAF has been a significant partner in regional harmonization efforts and has been tasked with implementation of the ECOWAS 2008 Seed Regulation.[86] CORAF's implementation efforts are focused through the West African Seed Program (WASP), which has been funded by USAID.[87]

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[80] Consultation Notes with Uganda's MAAIF.
[81] Mukaka, ed., COMESA Seed Harmonisation Implementation Plan (COM-SHIP) .
[82] New Markets Lab and SFSA, "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.
[83] Mukaka, ed., COMESA Seed Harmonisation Implementation Plan (COM-SHIP) at 73.
[84] Mukaka, ed., COMESA Seed Harmonisation Implementation Plan (COM-SHIP) at 8.
[85] New Markets Lab and SFSA, "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
[86] CORAF was formerly the Conference of the African and French Leaders of Agricultural Research Institutes (CORAF/WECARD) and Conference of the Agricultural Research Leaders in West and Central Africa.
[87] Katrin Kuhlmann and Yuan Zhou, "Seed Policy Harmonization ECOWAS: The Case of Ghana," NML and Syngenta Foundation for Sustainable Agriculture, January 2016.

SADC's experience highlights the need for a formally recognized regional entity with established funding. The SADC Seed Centre did not originally have legal standing and was established under a donor program, which gave rise to challenges by SADC Member Countries about its institutional structure.[88] In 2017, the SADC Seed Centre officially became a legal institution within the SADC system through the enactment of the SADC Seed Charter.[89] The change in legal status of the SADC Seed Centre has had a positive impact on variety registration.[90] For example, before the SADC Seed Centre became a legal institution, the SADC Variety Catalogue contained few varieties and was difficult to access online, but the change in legal status of the SADC Seed Centre has partly contributed to an uptick in regional seed variety registration in SADC.[91]

At the country level the EAC Partner States have designated the following regulators and actors as primary institutions for the seed sector:

- ✓ Kenya: KEPHIS is the main government parastatal regulatory body in Kenya's seed sector. In addition to KEPHIS, the NPTC and the NVRC are involved in variety release and registration.
- ✓ Rwanda: RICA was established under the Ministry of Agriculture and Animal Resources by Law No 31/2017 of 25/07/2017 Establishing Rwanda Inspectorate, Competition and Consumer Protection Authority; however, RICA is not yet fully operational. The Plant Variety Evaluation, Certification and Registration Committee is also a key entity responsible for evaluation, certification, and registration of plant varieties on the national varieties list.[92]
- ✓ Uganda: The National Seed Certification Services, created under section 8 of the Seed and Plant Act, 2006 (Seed Act), oversees the process of variety release and registration, and the National Seed Board, created under section 3 of the Seed and Plant Act, 2006 is also a key entity in the seed system.
- ✓ Tanzania: TOSCI was established under the Seed Act as the main regulatory institution in Tanzania's seed system.
- ✓ Burundi: ONCCS is the main authority tasked with implementing the Seed Law and is responsible for quality control, inspection, and variety release, among other functions.
- ✓ South Sudan: The Ministry of Agriculture is the main authority regulating the seed sector in South Sudan, with three main directorates that play significant roles in crop production, plant protection, and research. South Sudan also has a NVRC, which follows the Variety Release Guidelines issued by the Ministry of Agriculture.

[88] New Markets Lab and SFSA, Regional Variety Release Test Cases: 2018 Findings, December 2018.
[89] New Markets Lab and SFSA, Regional Variety Release Test Cases: 2018 Findings, December 2018.
[90] New Markets Lab and SFSA, "Manual on Regional Seed Regulations in the Southern African Development Community (SADC)" Seeds2b Program, publication forthcoming 2019.
[91] New Markets Lab and SFSA, "Manual on Regional Seed Regulations in the Southern African Development Community (SADC)" Seeds2b Program, publication forthcoming 2019.
[92] Law No. 005/2016 OF 05/04/2016, Governing Seeds and Plant Varieties in Rwanda.

Stakeholders have expressed the need for a semi-autonomous body/institution under the Ministry of Agriculture to regulate certification, SPS, and variety release and registration, among other processes related to seed.

Streamlined Variety Evaluation, Release, and Registration Process

Variety evaluation, release, and registration are regulated in all the three RECs in Eastern and Southern Africa, as well as in ECOWAS. Nevertheless, there are some slight but notable differences in how these processes are regulated. The EAC Seed Bill requires that Partner States designate a National Variety Release Committee in charge of the evaluation and registration of plant varieties, and national regulations must determine the functions and composition of this Committee.[93] This is a requirement that is present in the COMESA Seed Trade Regulations, the SADC Seed MOU, and the ECOWAS 2008 Seed Regulations. As noted above, however, the way in which the different regional rules approach regional variety release and registration differ slightly, which can complicate how national rules operate in practice.

For the release of a new variety within the EAC, the EAC Seed Bill requires two seasons of DUS and two seasons of VCU or NPT in a Partner State. A variety released in a Partner State can be released in a second Partner State after one season of DUS and VCU/NPT (often referred to as a "validation trial"). DUS testing should be done in accordance with EAC approved guidelines; these are not specified in the EAC Seed Bill but would presumably follow UPOV guidelines (this should be noted in the regulations to implement the bill). Moreover, varieties may be automatically entered into the EAC Regional Plant Variety Catalogue and released in a third Partner State under similar agro-ecological conditions.[94]

In SADC, both new and existing seed varieties can be entered into the SADC Variety Catalogue. The system sets out the procedures for the registration of new varieties that have been released in two SADC Member States and existent varieties that were registered and released in two SADC Member States prior to the launch of the SADC Variety Catalogue. New varieties can be registered in the SADC Variety Catalogue if they comply with DUS and VCU testing.[95] Article 11 of the SADC Seed MOU requires that DUS testing be done in accordance with UPOV guidelines. The SADC HSRS requires one year of DUS testing in the country of application, along with two seasons of VCU testing in two SADC Member States.[96] Existing varieties registered and released in at least two SADC Member States before the existence of

[93] Draft East African Community Seed and Plant Varieties Bill, 5, September 2018.
[94] Draft East African Community Seed and Plant Varieties Bill, 6, September 2018.
[95] Memorandum of Understanding on the Harmonization of Seed Regulations in the Southern African Development Community (MoU), 2008., Annex II, Arts. 11 and 13.
[96] Memorandum of Understanding on the Harmonization of Seed Regulations in the Southern African Development Community (MoU), 2008., Annex II, Arts. 11 and 13.

the SADC Variety Catalogue can automatically enter into the SADC Variety Catalogue.[97] Moreover, SADC is the only REC to explicitly allow for the registration of landrace varieties in the SADC Variety Catalogue. Although the procedures have not yet been developed for this type of registration, according to the SADC HSRS, landraces could be registered based on a standard similar to QDS.[98] The ECOWAS 2008 Seed Regulation, which also refers to landraces, does not mandate their regional registration but rather requires Member States to maintain a separate section in their national variety lists for these traditional varieties.[99]

The COMESA Seed Trade Regulations set out the procedure for the registration of both new and existing varieties and admit the registration of existing varieties released in one or two COMESA countries.[100] In all cases, varieties are required to comply with DUS and VCU or NPT tests.[101] Similar to SADC, the COMESA Seed Trade Regulations require DUS testing to be done in accordance with UPOV guidelines. New varieties require two seasons of testing, varieties released in one country require one season of additional testing, and varieties already released in two countries can automatically be registered in the COMESA Variety Catalogue.[102] ECOWAS also has a regional catalogue, the West African Catalogue for Plant Species and Varieties (WACPSV). According to the 2008 ECOWAS Seed Regulation, any variety entered into the national catalogue of one ECOWAS Member State would automatically be entered into the regional catalogue and can be traded and multiplied freely throughout the region without any further requirements. The regional catalogue in this case is essentially a compilation of Member States' national catalogues;[103] however, it is not yet fully operational, and implementation questions remain. Furthermore, a potential issue in implementation across all RECs relates to the role of public research organizations in variety testing and release.

The following table summarizes the requirements for regional seed variety release and registration:

Table 9: Variety Release and Registration Process for EAC, COMESA, SADC, and ECOWAS

EAC Bill	COMESA Seed Trade Regulations	SADC Seed MOU	ECOWAS 2008 Seed Regulations
• **New variety** shall be released in a Partner State after:	• **New variety** shall be released in the COMESA Variety Release System and	• **New variety** shall be eligible for entry in the SADC Variety Catalogue if it has	• WACPSV shall be the official document containing the list of

[97] Memorandum of Understanding on the Harmonization of Seed Regulations in the Southern African Development Community (MoU), 2008., Annex II, Art. 15.
[98] SADC, Technical Agreements on Harmonization of Seed Regulations in the SADC Region, the SADC Secretariat, 2008, 2.3.7.
[99] West African Catalogue of Plant Species and Varieties. 2008.
[100] COMESA Seed Trade Harmonization Regulations, 27-28, 2014.
[101] COMESA Seed Trade Harmonization Regulations, 20, 2014.
[102] COMESA Seed Trade Harmonization Regulations, 27-28, 2014.
[103] Katrin Kuhlmann and Yuan Zhou. "Seed Policy Harmonization in ECOWAS: The Case of Ghana", NML and SFSA, January 2016; Katrin Kuhlmann and Yuan Zhou. "Seed Policy Harmonization in ECOWAS: The Case of Nigeria", NML and SFSA, December 2018.

1. Two seasons of DUS, carried out in accordance with the EAC approved guidelines 2. Two seasons of VCU/NPT • **Variety already released in one of the EAC Partner States** can go through expedited release process for second EAC Partner State if undergoes: 1. One season of DUS 2. One season of VCU Provided that the NSA of the first Partner State shall share the data used to release the variety with the second state. • **Variety released in two EAC Partner States** is eligible for automatic release in another EAC partner State with similar agro-ecological zones, provided that the data used to release the variety in the two Partner States is shared with and verified by the EAC Seed Office. Only varieties that have been officially released in at least **two EAC Partner States** are eligible to be included in the Regional Plant Variety Catalogue; however, it is not necessary to register the varieties in the regional catalogue to be authorized to release them in a third EAC Partner State.	entered into the COMESA Variety Catalogue after: 1. Two seasons of DUS, carried out in accordance with UPOV guidelines 2. Two seasons of VCU/NPT • **Variety already released in one of the COMESA Member States** before the establishment of the COMESA Variety Catalogue, provided that the: 1. Application is submitted with the necessary DUS and VCU data from the first Member State, and 2. Variety has undergone one additional season of VCU testing and has been released in the second Member State. • **Varieties released in two COMESA Member States** before the establishment of the COMESA Variety Catalogue shall be entered into the Catalogue when an application is submitted with the necessary DUS and VCU data.	been released in at least two Member States. The DUS testing shall be done in the country of application for one growing season by a competent public or delegated private organization in accordance with UPOV guidelines (Article 11). For the VCU testing, the SADC Seed Centre, in consultation with Member States, shall develop specific guidelines for each crop, and the variety shall be tested for performance and adaptability for **two growing seasons** in the agro-ecological conditions for which it was developed. VCU testing in different Member States may be conducted within the same two growing seasons (Article 13). • **Varieties released in two Member States** before the establishment of the SADC Variety Catalogue shall automatically be entered in the Catalogue provided that: 1. An application is submitted to the SADC Seed Centre with the necessary information including DUS and VCU as required, and **2.** Variety is listed on the National Variety List in at **least two SADC Member States.**	all registered varieties in Member States. • The WACPSV shall be constituted by all registered varieties listed in Member States' national catalogues. To this end, each Member State shall institute a national catalogue of plant species and varieties.

Source NML 2019; EAC Seed Bill; COMESA Seed Trade Regulations; SADC Seed MOU; and ECOWAS 2008 Seed Regulations.

Stakeholders consulted expressed that most of the EAC Partner States already comply with the standard of two seasons of DUS and VCU testing, such as Burundi, Kenya, Rwanda, and Uganda, while Tanzania tests for two seasons of DUS but only one season of VCU. South Sudan, which adopted guidelines for variety release in 2016 that establish the requirement to submit agroeconomic, pest, and quality data for registration, does not have requirements for DUS and VCU. However, stakeholders also expressed concerns with the implementation of the COMESA and SADC regional catalogues, since, in practice, having a variety released in the regional variety catalogues does not mean automatic access to other Member States' markets. Reportedly, often COMESA and SADC Member States will require that variety also be released in the national variety catalogue before it can be commercialized internally, despite entry in a regional catalogue. Consequently, some of the seed companies consulted have opted to maintain offices in different countries in the region in order to register and release varieties at the national level, rather than rely solely upon the regional catalogues.[104] The alternative of opening offices in different countries to market seed at the national level is only an option for larger seed companies, however, and delayed implementation could negatively affect smaller seed companies, which may also lack the resources to rely upon the regional seed catalogues. Some countries are also requiring that the national variety catalogues recognize and reference the regional variety catalogues in order to create an explicit link between them.

The EAC Seed Bill treats variety evaluation, registration, and release differently than COMESA and SADC. Even though the EAC Seed Bill does mandate the creation of a regional catalogue (Section 7), the EAC Seed Bill does not require that a seed variety be released through the regional catalogue in order to authorize its commercialization within the region like in COMESA and SADC. In the EAC's case, once a variety is released in two Partner States, it may automatically be released in a third EAC country, provided that the data used for release in the two Partner States is made available to the EAC Seed and Plant Variety Committee for verification and that the agroecological conditions are similar. It is not clear from the text of the EAC Seed Bill which institution determines whether agroecological conditions are similar, which could present implementation challenges.

Furthermore, this departure from the way other RECs have regulated regional variety release and registration could affect implementation. As many of stakeholders expressed during the field visits, a major obstacle for regional seed trade is the lack of communication between NSAs. Consequently, if an NSA does not provide testing data to a third country NSA or to the EAC Seed and Plant Variety Committee, automatic release in a third EAC country could be difficult. However, simplifying the process around use of the regional catalogue could potentially streamline regional trade. In any event, the EAC Seed and Plant Variety Committee and the NSAs should design dissemination and education campaigns so that seed companies in the region are aware of the different requirements to trade seed regionally. Countries also need to establish effective procedures for the sharing of test data. One way for

[104] Private sector representative consulted during field visits, July 2019.

countries to streamline data sharing could be by establishing clear rules within their national legal and regulatory frameworks.[105]

Another notable difference between the EAC Seed Bill and the SADC and COMESA regulations is that the process for regional variety registration is not described in the current EAC Seed Bill, other than the requirement that a seed variety needs to be officially released and registered in the National Catalogues of at least two EAC Partner States before it is eligible to be included in the EAC Regional Plant Variety Catalogue. Further measures establishing the procedure and fees will be necessary in the future. Finally, the EAC, COMESA, and SADC all condition the release of a variety based on whether the variety adapts to the agro-ecological conditions of other member countries. The EAC Seed Bill mandates this expressly in Section 6(2) when a variety has been released in one EAC Partner State and is being released in a second Partner State and Section 6(3) when a variety has been released in two EAC Partner States and is being released in a third Partner State, while COMESA and SADC do so by requiring an additional season of VCU testing for those varieties that have already been released in one Member State and are in the process of being released in a second country. ECOWAS does not have a similar requirement, since varieties released in the national variety catalogues are meant to be automatically incorporated into the WACPSV.

At the country level all EAC Partner States regulate Variety Release and Registration, to varying degrees:

- ✓ Kenya: The Seeds and Plant Varieties Act of Kenya, along with other laws mentioned above, establishes the process for variety evaluation, release, and registration in Kenya, which is based on two seasons of DUS and VCU testing. Application for variety release and registration is made before KEPHIS.
- ✓ Rwanda: Applications for variety release and registration are submitted to the Plant Variety Evaluation, Certification, and Registration Committee, which is in charge of reviewing variety conditions and proposing a variety for DUS and VCU tests for two seasons,[106] with the registrar charged with the process of conducting trials and testing.[107]

[105] New Markets Lab, "Annotated Model Seed Law", NML and SFSA, December 2015.
[106] Ministerial Order no 010/11.30 of 11/04/2017 Determining the Procedures for Evaluation, Certification and Registration of Plant Varieties, Procedures for the Withdrawal of Certified Plant Varieties from the List and its Format, Official Gazette No. 16 of 2017.
[107] Article 8 of Ministerial Order no 010/11.30 of 11/04/2017 Determining the Procedures for Evaluation, Certification and Registration of Plant Varieties, Procedures for the Withdrawal of Certified Plant Varieties from the List and its Format, Official Gazette No. 16 of 2017.

- ✓ Uganda: The National Seed Certification Services is mandated to conduct DUS and VCU tests for two seasons and register varieties on the National Variety List and the Common Catalogue,[108] following release.[109]
- ✓ Tanzania: The Seed Act and the 2017 Seed (Amendment) Regulations establish the process for variety release and registration in Tanzania, with applications presented by a registered breeder to TOSCI. Seeds undergo two seasons of DUS and one season of VCU.
- ✓ Burundi: Burundi's main instrument for variety release is Law No. 1-08 of 23 April 2012. Seeds undergo two seasons of DUS and VCU testing.
- ✓ South Sudan: South Sudan's Seed Policy has been at a draft stage since 2016, and the process for variety release and registration is guided by the Variety Release Guidelines, issued by the Ministry of Agriculture.

Standardized Quality Control and Packaging Requirements

The EAC Seed Bill only allows the commercialization of certified seed within the EAC.[110] This requirement is similar to the standard set forth in COMESA, but it departs somewhat from SADC, which also recognizes alternative methods for quality assurance like QDS.[111]

Regulation of quality assurance, most commonly through formal seed certification, is a standard practice in most sub-Saharan African countries, and procedures exist to assure the quality of the seed being commercialized by certifying its genetic purity, identity, and origin.[112] Countries in the EAC region have approached regulation of seed quality assurance in different ways – some only recognize formal certification while others also recognize alternative methods like QDS. For instance, Tanzania, Uganda, and South Sudan recognize QDS as an alternative method of quality assurance, while Kenya, Rwanda, and Burundi do not. The main differences between seed certification and QDS include the scope of the commercial authorization, cost of the process, and actors responsible for assuring the quality of the seed, among other things. While formal seed certification often is considered more costly due to the involvement of a third party – usually the government – that must test the different seed lots and certify their quality, QDS is less expensive and allows farmers or producers to guarantee the quality of the seed in a trust-based system, following government established schemes and verification.[113] In a sense, formal seed certification carries more

[108] Under the definition section of the Seed and Plant Act, as well that of the Seed and Plant Regulations, "Common Catalogue" means the list of varieties that have been tested in more than one country and are eligible to be grown in those countries.
[109] Draft National Seed Policy, Ministry of Agriculture, Animal Industry and Fisheries, September, 2014. Available at: http://www.usta.ug/wp-content/uploads/2016/06/National-Seed-Policy-DRAFT-6.pdf.
[110] EAC Seed Bill Section 10(3).
[111] SADC Seed MOU, Article 16(17) and (18).
[112] Katrin Kuhlmann, "Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment," NML and SFSA, September 2015
[113] Katrin Kuhlmann and Yuan Zhou. "Seed Policy Harmonization in ECOWAS: The Case of Ghana", NML and SFSA, January 2016

administrative costs upfront, while QDS relies more on enforcement ex post. However, QDS has geographic limitations, while formal seed certification is commonly recognized within an entire country.

Many of the stakeholders consulted expressed concerns with seed certification systems within the six EAC countries due to lack of capacity (insufficient seed inspectors and testing labs) and the cost of getting seed certified. Several countries, including Kenya, Uganda, and Rwanda are in the process of implementing authorization of private seed inspectors to overcome public sector capacity limitations (Kenya is the farthest along in this process); Tanzania is also moving forward with such a process. However, this alternative approach is still not fully implemented and has presented some challenges in practice.

Based on best practices, regional rules can standardize certification procedures so that certification in one country is recognized in other countries within a region. In Eastern Africa, seed certification standards have been developed through ASARECA based on OECD and ISTA standards for ten crops (maize, sorghum, beans, groundnut, soybean, wheat, Irish potato, rice, sunflower, and cassava), and adherence to OECD and ISTA standards has become a common characteristic across the RECs.[114] Adoption of OECD and ISTA standards can raise the level of quality assurance; however, most regions and countries across Africa struggle with the requirements and infrastructure to comply with these standards. This was also confirmed by various stakeholders consulted during the field visits, such as stakeholders in Uganda who stated that the country had lost its ISTA membership in 2017.

Under the EAC regional rules, Partner States are required to designate official seed testing laboratories to perform certification. Additionally, the EAC Seed and Plant Variety Committee may also designate official seed testing laboratories to test seeds and issue certificates in the prescribed format. The procedures laboratories shall apply to test and certify seeds and issue certificates are not described in the EAC Seed Bill and will need to be defined through regulation issued by the Council of Ministers as established by Article 9 of the Treaty for the Establishment of the East African Community. The EAC Seed Bill recognizes four seed classes, with labels to be elaborated in forthcoming regulations.

Since many of the EAC Partner States are also members of COMESA or SADC, the slight differences in certification procedures, seed classes, and labeling should remain a focus. The following table summarizes the different seed classes and labeling requirements within each REC.

[114] See Katrin Kuhlmann, "Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment," NML and SFSA, September 2015; and, Nyachae, Obongo. Seed Certification Standards for Ten Selected Crops of Major Economic Importance in East Africa and Rwanda. Association for Strengthening Agricultural Research in Eastern and Central Africa (2007). The technical working group on certification met in September 2003 and September 2005, to develop these standards for Kenya, Tanzania, and Uganda, and in 2006 standards were developed for Rwanda.

Table 10: Seed Classes and Labels in the EAC, COMESA, SADC, and ECOWAS

Seed Classes and Seed Multiplication			
EAC	**COMESA**	**SADC**	**ECOWAS**
***Four* Seed Classes**: 1) Pre-basic seed; 2) Basic seed; 3) First-generation certified seed; and 4) Second generation certified seed.. Seed multiplication shall be undertaken according to the defined seed classes.	***Four* Seed Classes**: 1) Pre-basic seed (violet band on white); 2) Basic seed (white); 3) First-generation certified seed (blue); and, 4) Second generation certified seed (red). No explicit mention of seed multiplication.	***Five* Seed Classes**: 1) Pre-basic Seed (violet band on white); 2) Basic Seed (white); 3) Certified Seed (1st Generation Seed) (blue); 4) Certified Seed (2nd Generation Seed) (red); and 5) Quality Declared Seed (green). No explicit mention of seed multiplication.	***Four* Seed Classes**: 1) Parent material and pre-basic seeds (white with diagonal violet stripes); 2) Basic seed (white); 3) R_1 First-generation certified seeds (blue); and 4) R_2 Second generation certified seeds (red). Only seed registered in the West African Catalogue of Plant Species and Varieties may be eligible for the purpose of multiplication
Testing and Labeling			
EAC	**COMESA**	**SADC**	**ECOWAS**
5) Partner States shall designate existing entities to function as official testing laboratories. 6) The EAC Seed and Plant Variety Committee may designate official testing laboratories and issue EAC testing certificates. 7) Procedures for testing shall be defined in the regulations. 8) Labeling and sealing should be done in accordance with the regulations.	9) Articles 15, 16, and 17 of the COMESA Harmonized Seed Trade Regulations establish the labeling and testing requirements for seed in COMESA.	10) SADC HSRS establishes the region's quality control system through the Seed Certification and Quality Assurance System.[115] The system prescribes both the rules applicable to seed testing and labeling and certificate formats.[116] 11) ISTA Rules for Seed Testing apply, but others may be recognized for other species in consultation with the NSAs. 12) Labels and containers are regulated according to the SADC MOU (Articles 16(12), 16(13)). 13) NSA is responsible for licensing seed inspectors, seed samplers, seed analysts, and laboratories, following the minimum training requirements set by the SADC Seed	16) The ECOWAS 2008 Seed Regulation establishes obligations regarding quality control, production, packaging, and storage. 17) The objectives for quality control include assuring that the seeds inspected are of acceptable varietal or genetic purity; are in good physical and health condition; and meet technological standards. 18) Seed quality control shall apply to all stages and venues of production, from the farm to the producer's or distributor's storage facility, which must have previously been admitted for control. 19) The quality control section regulates who can apply for quality control testing and sets forth the criteria to become a professional cardholder,

[115] Technical Agreements on Harmonization of Seed Regulations in the SADC Region, the SADC Secretariat, 2008, 3.1.
[116] Technical Agreements on Harmonization of Seed Regulations in the SADC Region, the SADC Secretariat, 2008, 3.3.3 Figure 3.

		Centre (Article 17 SADC MOU). 14) Identity cards and certificates will be issued to inspectors, samplers, and seed analysts (Article 18 SADC MOU). 15) The SADC Seed Centre shall establish and maintain a database of all authorized staff and accredited laboratories, made available to users (Article 20 SADC MOU).	necessary to apply for quality control testing. 20) Control agents also regulated under the 2008 ECOWAS Seed Regulation will conduct at least four field inspections throughout the cropping cycle. 21) Seed batches will be subjected to laboratory testing based on ISTA and will be tested for analytical purity, water content, germination test, health status, and varietal purity.

Source NML 2019; EAC Seed Bill; COMESA Seed Trade Regulations; SADC Seed MOU; and ECOWAS 2008 Seed Regulations.

It should be noted that under SADC HSRS, NSAs are in charge of overseeing the system and authorizing laboratories, field inspectors, and analysts.[117] Additionally, implementation of the SADC Seed Certification and Quality Assurance System is not mandatory, and non-certified seeds can still be traded among SADC Member States provided that it complies with national requirements.[118] In COMESA, Member States have started to roll out common labels, marking a significant milestone, but stakeholders have raised concerns with delays and implementation challenges. However, there is agreement regarding color-coding[119] and the information to be included in the label, such as species, variety, seed testing certificate number, weight, seed class, etc.[120] Stakeholders from most countries expressed concern with a lack of capacity among public and private actors (when authorized) to certify seed. Additionally, stakeholders reported that the costs of seed certification de facto exclude small farmers or small businesses regional markets. The involvement of several national institutions and regional offices involved in seed certification implies an increased number of reference points and bureaucracy, which could create difficulties related to streamlining these processes in practice, especially for those countries that are members of more than one REC.

COMESA, SADC, and ECOWAS all establish regional packaging and labeling requirements, and implementation of regional packaging requirements may have a significant impact on cross-border trade. The EAC Seed Bill does not cover packaging, although this could be an issue that is dealt with through additional regulations. However, during the consultations, stakeholders expressed the concern that countries have different rules for packaging that

[117] Technical Agreements on Harmonization of Seed Regulations in the SADC Region, the SADC Secretariat, 2008, 3.2.3.
[118] Technical Agreements on Harmonization of Seed Regulations in the SADC Region, the SADC Secretariat, 2008, 3.3.3.
[119] COMESA Seed Trade Harmonization Regulations, 15, 2014.
[120] COMESA Seed Trade Harmonization Regulations, 16, 2014.

affect the size of seed packages and the materials in which seeds can be packaged and traded. For example, Kenya, Rwanda, and Tanzania currently ban the use of plastics (although Tanzania makes an exception for seed and fertilizer), which affects companies that want to trade in seed within the country.[121] Even though this is a good practice for environmental purposes, these types of requirements could be harmonized so that all EAC Partner States adhere to the same conditions. It is also important to note that repackaging to comply with different national packaging standards can also increase the incidence of seed blending, including with counterfeit seed.[122]

Different regulatory approaches to seed certification among the RECs could create further implementation challenges. For instance, in countries and regions like SADC, where QDS is recognized as an alternative to seed certification, compliance with the EAC Seed Bill could be problematic, given that the EAC Seed Bill expressly establishes that only certified seed can be traded under the EAC system. Further, the forthcoming regulations under the EAC system should align with the requirements already established under COMESA and SADC, like following the OECD Seed Schemes and ISTA accreditation to streamline harmonization in the region and the certification process.[123] Under COMESA, only minimum standards are prescribed, which means that COMESA Member States have some discretion in implementation. Further, as stated above, not all the EAC Partner States currently comply with these standards, and their adoption could be delayed by capacity issues within the countries. The ECOWAS 2008 Seed Regulation goes a step further than any of the other RECs by requiring members to implement specific certification standards.[124]

Each approach to seed quality control comes with its own benefits and challenges. While having minimum standards like COMESA gives countries more leeway to adjust national legal and regulatory frameworks than a detailed regulation like ECOWAS, when fully implemented, mandating countries to follow specific rules could help standardize certification requirements within a region. Nevertheless, capacity limitations must be considered.

Counterfeit seed within the EAC has been flagged as one of the main challenges by the different stakeholders consulted. Neither the EAC Seed Bill, nor any of the other RECs expressly addresses this issue. Regional efforts to address counterfeit seed could be further developed through regulations, and a coordinated and comprehensive approach to this issue could benefit the region as a whole. However, such an effort would require open communication and cooperation among the different NSAs, increased capacity, and coordinated enforcement mechanisms, all of which could be challenging.

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[121] STAK Consultation.
[122] New Markets Lab, "Annotated Model Seed Law", NML and SFSA, December 2015.
[123] New Markets Lab and Syngenta Foundation for Sustainable Agriculture, "Manual on Regional Seed Regulations in the Common Market for Eastern and Southern Africa (COMESA))", Seeds2B. 2019.
[124] New Markets Lab, "Annotated Model Seed Law", NML and SFSA, December 2015.

Finally, the EAC Seed Bill and the systems in COMESA and SADC allow countries to apply for permission to prohibit the use of a particular variety based on its unsuitability for cultivation or on a risk-based assessment. The SADC Technical Agreements establish that Member States can apply for permission to prohibit the use of a certain variety, provided that it is demonstrated that the variety is not suitable for cultivation in its territory or there are valid reasons to believe that such variety would pose a risk to health of other varieties or species, humans, or the environment.[125] This request shall be made to SADC authorities in charge of approving the prohibition. Under EAC Seed Bill, Partner States can also apply to the EAC Seed and Plant Variety Committee to prohibit the use of a variety in its territory based on similar reasons to those in the SADC HSRS (technical or risk issues).[126] The COMESA Seed Trade Regulations also allow Member States to apply to the COMESA Seed Coordination Unit to limit market access of registered varieties due to technical or risk issues.[127] For those countries in the EAC that are also members of another REC, using this provision would require going through a parallel process in COMESA or SADC. The ECOWAS 2008 Seed Regulations do not have a similar provision.

At the EAC Partner State level, seed certification and quality assurance methods are regulated as follows:

- ✓ Kenya: KEPHIS is the authority in charge of regulating the seed certification process under the Seed and Plant Varieties Act and the Seed Regulations. As already mentioned, KEPHIS is mandated to ensure quality assurance standards and inspections, both at the field level and during seed processing, in accordance with the Seed Regulations and OECD and ISTA standards. Kenya allows for six seed classes: breeder, pre-basic, basic, certified first generation, certified second generation, and standard seed. Kenya does have ISTA-accredited laboratories. Kenya allows the authorization of private sector inspectors and has commissioned a few, although this system is reportedly not yet fully operational. In addition, Kenya has developed a scratch-off system to address the issues of counterfeit seed. The scratch-off system allows companies to use labels created by KEPHIS that have barcodes that the buyer can scratch off and use to verify whether seed is fake or not. Although challenges were reported at the beginning of the initiative, the process seems to be more streamlined now.
- ✓ Rwanda: The seed certification process is under the mandate of RICA. However, since RICA has not yet been physically established, RAB continues to conduct certification of seed in Rwanda. Rwanda allows for five seed classes: pre-basic, basic, certified first generation, certified second generation, and QDS. Currently, Rwanda lacks ISTA accredited seed labs, and has limited staffing, inspectors, infrastructure, and funds to carry out the process. Considering that the procedures were very recently developed

[125] SADC Technical Agreements on Harmonization of Seed Regulations in the SADC Region, 2.3.6, 2008.
[126] EAC Seed Bill, 3(2)e, 2018.
[127] COMESA Seed Trade Harmonization Regulations, 29, 2014

and are still being implemented, it is not clear how the whole process will work in practice.

- ✓ Uganda: The Seed Certification Service regulates the certification process under the Seed and Plant Act or 2006 and the 2017 Seed and Plant Regulations. The Seed Certification Service is mandated with doing field inspection, testing, labeling, sealing, and certification in accordance with the seed regulations and OECD standards. As a result of capacity and resource inadequacies, Uganda lost its membership in ISTA, and the government currently does not have an ISTA accredited seed laboratory. Uganda allows for six seed classes: breeder, pre- basic, basic, certified first generation, certified second generation, and standard seed. Uganda currently recognizes the use of QDS as an alternative method of quality assurance. During the national validation meetings, stakeholders noted that there is a need to identify centers of excellence in the region to expedite technology development and dissemination.
- ✓ Tanzania: Tanzania's certification process is regulated under the Seed Act of 2003 and the Seed Regulations of 2007 and 2017 amendment. Tanzania follows the OECD Seed Schemes.[128] An authorized TOSCI inspector, in accordance with the OECD Seed Schemes and ISTA standards (Tanzania is a Member of ISTA and has an ISTA-accredited laboratory), carries out field inspections to assess compliance with the standard, and, when applicable, assigns a seed class to the seed inspected.[129] Tanzania allows for four seed classes: pre-basic seed, basic seed, certified one, and certified two. Tanzania also recognizes the use of QDS as an alternative method for seed quality assurance.
- ✓ Burundi: Burundi's process for seed certification is based on COMESA's harmonized regulations. Burundi's regulations establish that the certification process should follow OECD and ISTA standards, as well as AOSA standards. However, Burundi does not have an ISTA-accredited laboratory and has limited personnel to carry out seed certification. Burundi allows three classes of seeds, namely pre-basic seed, basic seed and certified seed.
- ✓ South Sudan: The certified seed classes in South Sudan are not clear, since there are no relevant provisions in regulation or law. Almost all seed in South Sudan is imported.

As shown, different seed classes across countries would need to be aligned with regional rules, and seed classes should ultimately be aligned across regions as well.

Standardized Phytosanitary Measures and Cross-Border Trade Requirements

[128] New Markets Lab with the Southern Agricultural Growth Corridor of Tanzania Centre Ltd. for the Alliance for a Green Revolution in Africa, "A Legal Guide to Strengthen Tanzania's Seed and Input Markets", April 2016.
[129] New Markets Lab with the Southern Agricultural Growth Corridor of Tanzania Centre Ltd. for the Alliance for a Green Revolution in Africa, "A Legal Guide to Strengthen Tanzania's Seed and Input Markets", April 2016.

The EAC, COMESA, SADC, and ECOWAS harmonized seed regulations all prioritize increased regional seed trade.[130] Regional harmonization of SPS measures could help farmers more easily comply with rules that apply across the region, provide certainty on testing procedures at the border, simplify export and import procedures, and reduce the time and cost of exporting or importing seed.[131] Regional rules on SPS also need to comply with international standards like the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), which mandates that countries adopt SPS measures in a way that does not unnecessarily restrict trade. The EAC already has an SPS Protocol that is based on Article 108 of the EAC Treaty; this protocol, even though binding and applicable to seed, does not address seed issues in particular, which means that the EAC Seed Bill and other forthcoming regulations could expand upon the obligations regarding SPS.

There are different approaches and good practices that underpin regional harmonization of SPS measures. These include paring down established lists of pests and diseases that apply at the regional level to include only those that: "(1) exist in some of countries but not in others; and/or (2) represent an economic threat." When this is done, seeds for many crops [could] be moved from one country to another without phytosanitary certificates, while seed for other crops [could] be traded with phytosanitary controls for a reduced list of realistic threats."[132] Even though the EAC, COMESA, and SADC have rolled out some harmonized SPS rules, implementation remains a challenge.[133]

While the EAC Seed Bill does not include provisions on SPS, article 4 of the EAC SPS Protocol requires that Partner States cooperate in matters of plant health, including harmonization of inspection and certification procedures of plant and plant products; regulate the import and use of GMOs; provide a framework for management of pests; build systems for pest listing, pest risk analysis, pest reporting, and designation of pest free areas and areas of low pest prevalence; strengthen capacity and provide appropriate facilities for undertaking SPS measures; enforce plant quarantine measures; and develop a framework for the design and management of plant quarantine facilities. Compliance with this provision, and ensuring that seeds traded in the EAC region meet the phytosanitary requirements from the International Plant Protection Convention (IPPC), would require that Partner States regulate phytosanitary measures, mutually recognize plant import and phytosanitary certificates issued by other EAC Partner States, develop and maintain quarantine and non-quarantine pests list for seeds, and adopt the EAC's quarantine and regulated non-quarantine lists.

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[130] EAC Seed Bill Section 4; COMESA Seed Trade Regulations Section 3; SADC Seed MOU Article 2; and ECOWAS 2008 Seed Regulations Article 2.

[131] New Markets Lab, "Annotated Model Seed Law", developed for the Syngenta Foundation for Sustainable Agriculture, December 2015.

[132] Gisselquist, David. Harmonization of Seed Legislation and Regulation in CEEC, CIS, and Other Economies in Transition. FAO, 2001.

[133] World Bank. "Non-Tariff Measures on Goods Trade in the East African Community." World Bank (2008).

The SADC HSRS addresses the issue of quarantine and phytosanitary measures for seeds by incorporating two lists of pests, (i) a list of pests that require control when the seed is traded among SADC Member States[134] and (ii) a list of pests that require control when the seed is imported to a SADC Member from a territory outside of the SADC Region.[135] These pest lists have been introduced according to the SADC Seed Centre website. To be traded in the SADC region, seeds must be accompanied by a phytosanitary certificate issued by the exporting SADC Member State and an import permits. SADC HSRS requires the issuance of an additional certificate, a re-export Phytosanitary Certificate, when the lot has been stored or repacked in the territory of the importing country under circumstances that might have resulted in the infection or infestation of the lot, or when the lot was in transit for a longer period than established by the regulations.[136]It should be noted that SADC Member States are not obliged to adhere to SADC's pest list and can instead adopt alternative methods for control of quarantined pests.

The COMESA Seed Trade Regulations include a COMESA Quarantine Pest List, which has not yet been fully implemented. COMESA Member States are allowed to adopt phytosanitary measures and request documentation as they deem necessary, while using discretion and justifying any re-testing of seeds.[137] Seeds traded throughout COMESA must be accompanied by a Plant Import Permit, a Seed Testing Certificate and a phytosanitary certificate, issued by the exporting COMESA Member States.[138] In ECOWAS, NPPOs are required to issue phytosanitary certificates in line with the requirements of the ECOWAS Regulation; however, no universal pest quarantine list currently exists. Nevertheless, ECOWAS Member States have the obligation to periodically review pest lists and exchange information on pests.[139] Table 11 summarizes the key phytosanitary and cross-border trade provisions in the RECs.

Table 11: Phytosanitary and Cross-border Trade Measures for EAC, COMESA, SADC, and ECOWAS

Phytosanitary Measures, Seed Marketing, and Trade			
EAC	**COMESA**	**SADC**	**ECOWAS**
Each Partner state shall: • Provide a framework for the management of pests;	• Member States shall adopt the COMESA Quarantine Pest List for seeds, which has	• Two rationalized pest lists have been introduced: (a) SADC list of pests which	• A universal pest quarantine list does not yet exist, although the ECOWAS

[134] Memorandum of Understanding on the Harmonization of Seed Regulations in the Southern African Development Community (MoU), 2008., Annex IX.
[135] Memorandum of Understanding on the Harmonization of Seed Regulations in the Southern African Development Community (MoU), 2008., Annex X.
[136] Memorandum of Understanding on the Harmonization of Seed Regulations in the Southern African Development Community (MoU), 2008., Annex II, Art.26.
[137] COMESA Seed Trade Harmonization Regulations, 39, 2014.
[138] COMESA Seed Trade Harmonization Regulations, 32, 33, 2014.
[139] Katrin Kuhlmann, New Markets Lab for the Syngenta Foundation for Sustainable Agriculture. "Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment," September 2015.

• Provide appropriate facilities and strengthen capacity for undertaking phytosanitary measures; • Build systems for surveillance, pest listing, pest risk analysis, pest reporting, and designation of pest free areas and areas of low pest prevalence; • Develop a framework for the design and management of plant quarantine facilities; and • Regulate importation, research, development and use of GMO products.	not yet been fully implemented. • The NPPO from an importing Member State will issue a Plant Import Permit to a seed importer authorizing the importation of seeds in accordance with the existing phytosanitary regulations. • The NPPO of an exporting country will issue a phytosanitary certificate that guarantees that the requirements on the Plant Import Permit have been satisfied. • NPPOs may issue non-compliance notifications to other NPPOs of Member States when the seed inspected does not comply with the Plant Import Permit or a quarantine pest has been intercepted. • NPPOs shall issue a Re-export Phytosanitary Certificate when seed is in transit, the seeds lots are arriving from an exporting COMESA Member State, and the consignment is being stored or repacked under circumstances which may create a risk of infestation or infection before re-export to a third COMESA Member State, or the consignment has stayed in the territory for longer than determined by the NPPO. • Necessary documentation must accompany any movement of seeds within the common market; they shall apply phytosanitary measures only in respect to pests which are not common to all	require control when seed is being traded between Member States, and (b) a SADC list of pests which require control when seed is imported into a Member State from outside the SADC Region. • The SADC Seed Centre shall monitor regional and international developments concerning quarantine and phytosanitary measures and consult with the NSAs and NPPOs to collect information and suggest regional action plans. • The NPPO from an importing Member State issues a Plant Import Permit to a seed importer authorizing the importation of seeds in accordance with the existing phytosanitary regulations. • The NPPO of an exporting country will issue a phytosanitary certificate that guarantees that the requirements on the Plant Import Permit have been satisfied. • NPPOs in importing countries may issue non-compliance notifications to other NPPOs of Member States when the seed inspected does not comply with the Plant Import Permit, or a quarantine pest has been intercepted. • NPPOs shall issue Re-export Phytosanitary Certificate when seed are in transit and the seeds lots are arriving from an exporting SADC Member State and the consignment is being stored or repacked under	Commission shall determine the list of quarantine and non-quarantine organisms drawn up for the purpose of inter and intra-Community trade and the modalities of seed phytosanitary control. • All seed export and import shall be accompanied by a phytosanitary certificate issued NPPO of origin of the seed. • For the purpose of issuance of phytosanitary certificate, Member States shall periodically conduct surveys and exchange information to create comprehensive inventories of the pests existing in the States. • Such inventories shall serve to update the list of quarantine and non-quarantine organisms. • The import and export of conventional seeds shall be subject to prior declaration to the official quality control and certification service or body. • The importer or exporter shall provide the information regarding corporate name and address; species and variety registered in the WACPSV; seed category and generation; batch number; declared batch weight; number of packages; unit weight per package; number of labels specifying first and last digits; and chemical treatment with the name of

	Member States or not present in the importing Member State; re-testing of seeds can be done where there are justifiable reasons to assume that the quarantine pest might have been introduced, but no re-testing should be imposed for seeds in transit unless the consignment has stayed on the country for a period longer than that determined by the NPPO or it has been exposed to infestation or infection. • Equivalent or alternative methods of quarantine pest control are allowed if they have been declared, if they are technically and economically feasible, and if they provide the same level of protection against pests.	circumstances which may create a risk of infestation or infection before re-export to a third country, or the consignment has stayed in the territory for longer than determined by the NPPO. • Necessary documentation must accompany any movement of seeds within the common market; they shall apply phytosanitary measures only in respect to pests which are not common to all Member States or not present in the importing Member State; re-testing of seeds can be done where there are justifiable reasons to assume that the quarantine pest might have been introduced, but no re-testing should be imposed for seeds in transit unless the consignment has stayed in the country for a period longer than that determined by the NPPO or has been exposed to infestation or infection. • Equivalent or alternative methods of quarantine pest control are allowed if they have been declared, if they are technically and economically feasible, and if they provide the same level of protection against pests.	active ingredients used. • Batches in transit shall be declared to the NPPO by the individual or corporate entity responsible for transit. • The declaration should include all the relevant information of the seed batch and company or private person responsible for transit. It should also include phytosanitary certificates indicating the source and destination of the seeds. • Batches in transit shall not be subject to quality control in the transit countries.

Source NML 2019; EAC Seed Bill; COMESA Seed Trade Regulations; SADC Seed MOU; and ECOWAS 2008 Seed Regulations

Harmonization of pest lists within the EAC region will be essential to streamline cross-border trade of seed. During the consultations, various stakeholders stressed that the

different standards and lists applied within the EAC countries make it difficult to import and export seed. Some of the countries, like Kenya, have very expansive pest lists that include pests that are not present in the region, while countries like South Sudan do not yet have pest lists in place.

At the EAC Partner State level, sanitary and phytosanitary and cross border trade measures include:

- ✓ Kenya: KEPHIS has the power to issue import and export permits and phytosanitary certificates, and also controls seed merchant's registration, which is required for the importation and exportation of seeds. To ensure plant health and safety, KEPHIS has officers and inspectors at points of entry and exit. Imported seed must be accompanied by an ISTA orange certificate and a phytosanitary certificate. The seed is subjected to laboratory analysis tests upon importation. Kenya has a pest list, although it is expansive and outdated, which creates a challenge to cross border trade. Stakeholders have also reported that Kenya's lack of trust in other countries' pest lists poses an additional challenge.
- ✓ Rwanda: The import and export of seed are regulated under the Seed Law and Ministerial Order no 007/11.30 of 11/04/2017, which determines the requirements for obtaining a license for importing and exporting seeds. To import seed into Rwanda, a registered seed dealer applies to RICA for an import permit. The seed imported must be of a variety that is registered on the plant variety list and comply with the minimum seed standards, including packaging and labeling standards. Exported seed must be accompanied with an export permit from RICA and a phytosanitary certificate; it must also conform to the regional seed standards and be properly packaged and labeled. Given that RICA is not yet operational, RALIS is handling import and export procedures for seed. Currently, Rwanda does not have an ISTA accredited laboratory and is not yet fully competent to issue phytosanitary certificates when a company intends to import. Rwanda also does not currently have pest lists.
- ✓ Tanzania: Importers and exporters of seed in Tanzania are registered before TOSCI and the Director of Agricultural Development of the Ministry of Agriculture, Food Security, and Cooperatives. An application for import or export is submitted before the Director of Agricultural Development of the Ministry of Agriculture, Food Security, and Cooperatives, who is in charge of issuing the corresponding permits. The Ministry of Agriculture, Food Security, and Cooperatives publishes the seed varieties that may be imported and sold in Tanzania, and such seed must comply with the quarantine requirements in the Plant Protection Act. Moreover, a pest list is published in the Gazette.
- ✓ Uganda: Regulations in Uganda require registered seed merchants to apply to the Seed Certification Service for a permit to import seed. Imports must be accompanied with an orange ISTA certificate and a phytosanitary certificate in accordance with the Plant Health Protection Act of 2015. Once imported, seed is tested to assess whether

it meets relevant standards. Uganda has adopted a pest list, although it is outdated, which creates a challenge for cross border trade.

- ✓ Burundi: For importation, Burundi requires that seeds conform with international phytosanitary standards and be accompanied by a certificate of origin and an import permit. Burundi admits the importation of hybrid seeds through import permits granted by the Ministry of Agriculture and Livestock, after approval of the Plant Protection Department. Once a variety is imported, it is subjected to laboratory testing upon payment of fees.
- ✓ South Sudan: There are no specific legal requirements or streamlined processes for the importation of seed into South Sudan. Practices are inconsistent and often depend upon the importer's bargaining power. Because South Sudan does not have a formal procedure, no testing is done. During the national validation meeting, stakeholders reported that there are laboratories at the Nimule, Kaya, and Nadapal border posts with the necessary equipment, but these not yet used due to the lack of skilled technical personnel and financial resources. Importers can formally import seeds by applying for an import permit before the Department of Plant Protection under the Ministry of Agriculture.

Plant Variety Protection Legal, Regulatory, and Institutional Framework

PVP and the derived PBRs are not usually covered under regional seed harmonization rules. However, they are an essential aspect of seed regulation that can have a significant impact on seed market development and could also be used as a way to enforce anti-counterfeiting measures, since they can provide traceability of the seeds being marketed. The EAC Seed Bill will be the first legal instrument within a regionally harmonized seed regulatory instrument. Nevertheless, there are several relevant agreements that do apply at the regional and international levels, including UPOV and ARIPO. Several countries in Africa and most countries within the EAC region have national legal PVP frameworks in place and are members of these other regional and international agreements. Assessing the obligations established in the EAC Seed Bill and their conformity with the other regional and international agreements will be paramount to identifying challenges in implementation.

Internationally, the main instrument that regulates PVP and PBRs is the International Convention for the Protection of New Varieties of Plants (UPOV), adopted in Paris in 1961 and revised in 1972, 1978, and 1991. Current members of UPOV either adhere to UPOV 1978 or UPOV 1991. The differences between the two versions will be discussed in further detail below. Kenya and Tanzania are both members of UPOV; Kenya became a member in 1999 and adopted the UPOV 1991 Convention; Tanzania became a member in 2015 and also adopted the UPOV 1991 Convention.[140] Rwanda, Uganda, Tanzania, and Kenya are also members of ARIPO, which has initiated the process of acceding to the UPOV Convention as a

[140] UPOV, "Status in Relation to The International Union for the Protection of New Varieties of Plants (UPOV)", May 2019.

regional institution. Countries and international organizations can also consult UPOV to seek guidance on how to design their PVP laws. Relevant to this report, SADC as an institution, [141] and Burundi have separately sought that assistance from UPOV.[142]

All of the EAC Partner States, except for South Sudan, already have national legal and regulatory frameworks for PVP, although the degree of implementation varies throughout the region. The EAC Seed Bill also follows the UPOV 1991 Convention; consequently national alignment for Kenya, Tanzania, Rwanda, and Uganda should not be too onerous. Burundi's PVP Decree covers most of the obligations in the UPOV 1991 Convention, and South Sudan would be expected to follow this convention and the EAC Seed Bill when drafting its national legal framework to align with the regional rules. More details on the national frameworks for PVP are covered in the country regulatory snapshots in Section I, although notable highlights include:

- ✓ Kenya: In 2012, Kenya adopted the Seeds and Plant Varieties (Plant Breeder's Rights) Regulation, subsidiary regulation to the Seeds Act (Cap 326), to grant and protect plant breeders' rights. This regulation is based on UPOV 1991, with which Kenya is fully compliant. Depending upon the type of plant, PVP protection in Kenya lasts between 20 and 25 years. KEPHIS is the recognized institutional authority for enforcing PBR under the Seeds Act.
- ✓ Rwanda: Rwanda has implemented protection for PBR through Law No.005/2016 of 05/04/2016 Governing Seed and Plant Varieties followed by several ministerial orders. The PBR registrar has the mandate over the registration process in Rwanda. The regulations grant PVP to new, distinct, uniform, and stable varieties. The PBR registrar is charged with conducting the required tests. However, there is need for capacity building. There are no forms for registration yet, so the registrar is implementing UPOV mechanisms in the meantime. The Rwanda Ministry of Agriculture and Animal Resources (MINAGRI) aims to achieve some registrations by the end of the year.
- ✓ Tanzania: Tanzania is a member of UPOV and has adopted the PBRs Act of 2012, which conforms to UPOV, and the Protection of New Plant Varieties (Plant Breeders' Rights) Regulations of 2018 as the main legal instruments governing PBRs in Tanzania. The key regulatory body in the regulation of PBRs in Tanzania is the PBRs Office, established under the PBR Act, with the mandate to grant plant breeders' rights, maintain the PBRs register, facilitate the transfer and licensing of PBRs, coordinate with domestic, regional and international bodies on all issues relating to PBRs, and perform any other related functions.
- ✓ Uganda: Uganda has adopted the Plant Variety Protection Act in 2014, which provides for PBR and PVP. It establishes the Plant Variety Protection Office in the Ministry of

[141] UPOV, "Workshop on Data Handling." June 2004, available at: https://www.upov.int/export/sites/upov/publications/en/pdf/upov_data_bei_04_01.pdf.
[142] UPOV, "Status in Relation to The International Union for the Protection of New Varieties of Plants (UPOV)", May 2019.

Agriculture, and a registrar with the mandate to receive and examine applications for the registration of PBRs; assign the testing of the variety to the seed certification unit or another relevant body; publish applications of PBRs in the gazette; publish objections against an application and conduct a hearing on an objection; and register and issue certificates for plant breeder's rights. While stakeholders stated that Uganda's PVP Act was based on provisions of UPOV and ARIPO, its provisions are slightly different, as it preserves the protection of farmer's rights to use saved seed and traditional varieties, a provision that a number of stakeholders have highlighted as important. Regarding the EAC Seed and Plant Varieties Bill, stakeholders noted during the national validation meeting that PVP and PBR should not be included in the regional regulation. The rationale given was that the current EAC Seed Bill and Plant Varieties Bill is based on UPOV 1991, which does not provide protection to indigenous varieties, yet approximately 95 percent of seed used in Uganda is either home-saved or developed from local materials. Stakeholders further affirmed that where the PVP provisions in the EAC Seed and Plant Varieties Bill are preferred, an exception should be made to allow for a sui generis/unique regime that protects indigenous varieties and farmer saved seed.

- ✓ Burundi: Burundi has adopted Decree No. 100/55 in 2013 on PVP to grant and protect plant breeders' rights. Although Burundi has not ratified UPOV, it has been in contact with UPOV for assistance in the development of its PVP Decree based on the UPOV Convention. Currently, Burundi's PVP Decree includes most of the provisions incorporated in UPOV 1991, but it still preserves the protection of farmer's rights to use saved seed and traditional varieties, which has been highlighted by stakeholders as important as noted above.
- ✓ South Sudan: South Sudan does not have any legislation on PBRs or PVP.

Most of the regional and international rules that apply to the EAC Partner States are aligned with the UPOV 1991 Convention, such as the SADC Protocol for the Protection of New Varieties of Plants in the SADC Region and the Arusha Protocol for the Protection of New Varieties of Plants developed under ARIPO.[143] Even though most of the EAC Partner States follow the UPOV 1991 Convention, there are some notable differences between UPOV 1991 and UPOV 1978, the main one being the scope of the plant breeders' rights. While UPOV 1978 only extended protection for three activities, namely production for purposes of commercial marketing, offering for sale, and marketing, UPOV 1991 expanded the scope to four additional activities: importation, exportation, conditioning for the purpose of propagation, and stocking for any of the purposes mentioned above. This expansion raises issues with respect to the common practice among smallholder farmers of saving a portion of the seed each season to either use it in future season or exchange with other neighboring farmers,

[143] African Centre For Biodiversity, "The Arusha Protocol and Regulations: Institutionalizing UPOV 1991 in African seed systems & laws," September 2018. Available at: https://acbio.org.za/sites/default/files/documents/The%20Arusha%20Protocol%20and%20Regulations_Institutionalising%20UPOV%201991%20in%20African%20seed%20systems%20and%20laws.pdf.

also known as "farmer's privilege". UPOV 1978 did not expressly prohibit this practice. Although UPOV 1991 expanded the scope of PBR protection to stocking of seed for any purpose, UPOV 1991 does allow for "farmers privilege" to the extent that it is covered under national law or regulation. The "farmer's privilege" practice is included in Uganda's PVP law and Burundi's Decree on PVP as mentioned above, and it will be important to take this into account as the EAC Seed Bill provisions are implemented.

The EAC Seed Bill approaches Plant Variety Protection through streamlined applications for PBR at the regional level; consequently, protection throughout the region shall be granted under a single application. The breeder will apply for PVP to the relevant authority within the Partner State in accordance with the national laws in that State. When an application is intended to afford protection in more than one Partner State, the relevant authority of the Partner State to which the application is made will transmit copies of the application received to the relevant authorities of the other Partner State specified in the application in which protection is sought. After grant of PBR/PVP, the relevant national plant variety protection entity of a Partner State will submit the relevant details regarding the breeder and the protected variety to the Secretariat, to enter them in the EAC Register of Breeders' Rights. The Secretariat will maintain the EAC Register of Breeders' Rights.

The EAC Seed Bill is not exhaustive, and the Council shall make regulations that will prescribe procedures that will be applied where the application for PVP/PBR is to have effect in more than one Partner State. The procedures described under the regulations shall include examination of the application, sharing test results, conditions for protection, rights of priority, the scope of PBR, registration requirements, and PBR maintenance requirements.

Under UPOV, varieties eligible for protection are those that are:

- New, meaning that by the application date the variety has neither been sold nor exploited in the territories of the Partner States for more than one year, or in the territories of other states more than four years before the application date;
- Distinct, meaning that the variety is clearly distinguishable from any other variety;
- Uniform in its relevant characteristics; and
- Stable, meaning that its characteristics remain unchanged after propagation.

These conditions are exhaustive, and no other conditions are taken into account under UPOV when granting protection. The rationale is that making the list of conditions exhaustive can provide certainty to applicants and diminish the level of discretion the reviewing agents have in determining whether to grant protection. Under regulations to accompany the draft EAC Seed Bill and Plant Varieties Bill, the Council shall describe the conditions for protection. In compliance with international and regional good practices, the same conditions of protection as those under UPOV could be included in the regulations under the EAC Seed Bill.

The scope of breeders' rights under the EAC Seed Bill shall also be described in the regulations. In accordance with UPOV 1991, this could include activities related to multiplication of the variety; conditioning for the purpose of propagating; sale; marketing;

exporting; importing; and stocking of the harvested material or of products derived from the harvested material. Farmers or seed dealers wishing to use a protected variety for any of these activities would require previous authorization from the breeder, who can subject such authorization to conditions and limitations. The scope of plant breeders' rights could also extend to varieties essentially derived from the initial variety. Additionally, breeders may grant exclusive or non-exclusive licenses of protected rights to any person.

Given that the EAC Seed Bill will become operational in countries where there is already a PVP system that follows international rules, the regulations could recognize a right of priority for breeders' applications for PBR under systems other than those of the Partner States or intergovernmental organizations that might offer protections similar to the EAC's, or of another system to which the EAC is a party.[144] The length of protection granted could also be similar to that under UPOV and the Arusha Protocol, namely, twenty years from the date the PVP/PBR is granted, except for trees and vines, which should be protected for twenty-five years.

Regarding exceptions to plant breeders' rights, the regulations to the EAC Seed Bill could exclude from its scope of application any activity in relation to private activities for non-commercial purposes; acts for experimental purposes; and acts for breeding other varieties. The regulations could also exclude the application of PBR to agricultural crops and vegetables with a historical common practice of farmers saving seed, and to the product of the harvest of a farmer. The exceptions to PBR could be used as a way to maintain Uganda and Burundi's farmer's privilege practice in line with the regional rules (as well as allow for other countries to also offer this privilege). This language aligns with UPOV 1991, which in Article 15(2) allows members of UPOV to restrict breeders' rights in relation to any variety in order to permit farmers to use for propagation purposes, on their own holdings, the product of their harvest. However, the application of this provision in practice would need to include a definition of "propagation" that allows farmers to save seed for future use and exchange.

UPOV has issued a document that serves as guidance for the preparation of laws based on UPOV 1991.[145] While the EAC Seed Bill is not comprehensive, the regulations that shall be developed thereunder could adopt the provisions of UPOV 1991 . Nevertheless, as mentioned throughout this report, adoption of legal and regulatory frameworks is only the first step towards harmonization. Successful implementation of Part VI of the EAC Seed Bill on PVP will require economic and human resources at the regional level to make sure that the EAC Secretariat can carry out its mandate of maintaining the EAC Register of Breeder's Rights. Further, enforcement of these regional commitments at the national level could present a challenge. As expressed by the majority of stakeholders consulted throughout the

[144] EAC Seed Bill Section 11(2).
[145] UPOV, "Guidance for the Preparation of Laws Based on the 1991 Act of the UPOV Convention," Adopted by the Council on April 6, 2017, available at: https://www.upov.int/edocs/infdocs/en/upov_inf_6.pdf.

field visits, counterfeit seed is a major issue within the region, and even though PBRs could help address this issue, operationalization of this processes will be essential.

Regional harmonization of fertilizer rules in the EAC, and in general in sub-Saharan African countries, is a priority, because fertilizer use remains low and many countries in the region do not produce fertilizer, which makes them dependent upon importation for internal consumption. In the EAC Partner States, few fertilizer production companies exist, and many countries rely heavily upon imports. Enforcement of rules dealing with adulteration and bag weight compliance are among the most common quality issues throughout sub-Saharan Africa.[146] Consequently, the policy objectives behind fertilizer regulation mostly focus on guaranteeing the quality of the product being sold in the market. Fertilizer harmonization efforts in Eastern and Southern Africa are generally less developed than those in seed. Neither COMESA nor SADC has adopted binding regulations on fertilizer harmonization. The EAC announced its intention to pass a harmonized regional bill on fertilizers in July 2013,[147] and a draft EAC Fertilizer Bill and Policy have been developed under this project. ECOWAS, on the other hand, adopted the 2012 Regulation Relating to Fertilizer Quality Control in the ECOWAS Region (ECOWAS 2012 Fertilizer Regulations)[148] and is the most advanced REC with regard to harmonization of fertilizer regulations.

The enabling environment for fertilizer is fundamental for creating conditions for private sector participation, which can facilitate the introduction of more fertilizer varieties into the market and lower market prices. This, in turn, should increase farmers and producers' access to fertilizer and enhance food security.[149] The enabling environment for fertilizer includes standards, policies, laws, regulations, institutional infrastructure, and practices that guide the behavior of the different fertilizer stakeholders.[150] In a market that is characterized by cross-border trade and regional integration, regional rules, together with national legal and regulatory frameworks, will be part of the fertilizer enabling environment.

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[146] IFDC, "ECOWAS Fertilizer Regulatory Framework: Implications for the Development of Private Sector-Led Supply of Quality Fertilizers in West Arica," Policy Brief. December 2018.

[147] Ubwani, Zephania. EAC Set to Harmonise Seed, Fertiliser Policies. The Citizen, Oct. 14, 2013. Web. Nov. 3, 2014. Available at: https://www.thecitizen.co.tz/News/EAC-set-to-harmonise-seed--fertiliser-policies-/-/1840392/2031260/-/luafbcz/-/index.html.

[148] ECOWAS, Regulation C/REG.13/12/12 Relating to Fertilizer Quality Control in the ECOWAS Region, 2012, available at https://documentation.ecowas.int/download/en/legal_documents/regulations/acts/REGULATION%20CREG.131212%20RELATING%20TO%20FERTILIZER.pdf.

[149] Joshua Ariga, Shannon B. Keating, Katrin Kuhlmann, Nicole M. Mason, and Maria Wanzala-Mlobela, "Creating an Enabling Environment for Private Sector Investment in Fertilizer Value Chains in Sub-Saharan Africa: Empirical Evidence and Knowledge Gaps." IFDC, Michigan State University, AFAP, and NML, December 2018.

[150] Joshua Ariga, Shannon B. Keating, Katrin Kuhlmann, Nicole M. Mason, and Maria Wanzala-Mlobela, "Creating an Enabling Environment for Private Sector Investment in Fertilizer Value Chains in Sub-Saharan Africa: Empirical Evidence and Knowledge Gaps." IFDC, Michigan State University, AFAP, and NML, December 2018.

Currently, countries in sub-Saharan Africa face several challenges related to the consumption and regulation of fertilizers. On the one hand, fertilizers entail high transaction costs on both the supply-side and demand-side that hinder farmers' access. [151] On the other hand, while some governments have implemented regulations to promote an efficient fertilizer market, gaps in these regulations, lack of knowledge of the system among stakeholders, and overlapping processes remain a challenge.[152] Most EAC Partner States, with the exception of South Sudan, have some degree of national regulations for fertilizers, some of which include registration and licensing procedure for fertilizers and import measures.[153]

Even though only ECOWAS has adopted fertilizer regulations, other RECs besides the EAC have advanced harmonization efforts to varying degrees. In COMESA, harmonization of fertilizer regulations has been led by COMESA's implementing agency, ACTESA, through the Joint Program on Fertilizer Policy Harmonization, in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP).[154] In the context of this initiative, NML and AFAP developed the *Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA*.[155] This document describes and expands on different regulatory good practices that could provide useful guidance for the harmonization efforts in the EAC. The guidelines aim to contribute to the development of a regulatory environment that promotes the harmonization of regulations on fertilizers to increase availability and broader use of fertilizers for farmers in Eastern and Southern Africa.[156]

In SADC, the need for regional harmonization of regulations in the agricultural sector, including fertilizers, has been acknowledged in the Regional Agricultural Policy (RAP) adopted by the Ministers of Agriculture of SADC's Member States.[157] The SADC RAP called for the adoption of regional harmonized rules with the purpose of increasing regional trade in agriculture and improving farmers' access to markets. In particular, the SADC RAP

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[151] NML in in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

[152] NML in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

[153] See country-by-country analysis section.

[154] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

[155] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

[156] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

[157] SADC, Regional Agricultural Policy (RAP) Country Summary Agricultural Policy Review Reports, January 2011, available at https://www.sadc.int/files/7113/5293/3509/Regional_Agricultural_Policy_Review_Reports_2011.pdf.

highlighted the lack of access to fertilizers by farmers. Moreover, through country-specific studies and stakeholder consultations, the SADC RAP included the harmonization of fertilizer policies as a key input and objective,[158] along with the proposal to create regional fertilizer associations.[159] Nevertheless, the SADC RAP does not currently include any binding obligation on SADC Member States related to the harmonization of fertilizer regulations and can merely serve as a guideline for SADC Member States to achieve common measures and objectives.[160]

Comparative Assessment: ECOWAS 2012 Fertilizer Regulation

ECOWAS has taken the lead in regional fertilizer regulatory harmonization efforts with the adoption of the ECOWAS 2012 Fertilizer Regulation. Figure 4 below highlights the key provisions of the ECOWAS 2012 Fertilizer Regulation.

[158] SADC, Regional Agricultural Policy (RAP) Country Summary Agricultural Policy Review Reports, January 2011, p. 123, 259, available at https://www.sadc.int/files/7113/5293/3509/Regional_Agricultural_Policy_Review_Reports_2011.pdf.
[159] SADC, Regional Agricultural Policy (RAP) Country Summary Agricultural Policy Review Reports, January 2011, p. 153, available at https://www.sadc.int/files/7113/5293/3509/Regional_Agricultural_Policy_Review_Reports_2011.pdf.
[160] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

Figure 4: Key Provisions of the ECOWAS Fertilizer Regulations

Source: ECOWAS 2012 Fertilizer Regulations adapted by © 2019, New Markets Lab; also see John C. Keyser et al (2015)

Notably, the regulatory approach taken in ECOWAS focuses more on ex post control, or enforcement, rather than an ex ante approach market regulation that imposes regulatory requirements prior to market entry like registration and approved fertilizer lists. For instance, the 2012 ECOWAS Fertilizer Regulation mandates that countries not adopt and

maintain lists of pre-approved fertilizers that can be sold in the region but rather calls upon countries to allow the free movement of fertilizers as long as the imported fertilizer is subjected to the same quality control measures and level of inspection as if it were produced within the country. This ex post regulatory approach is less restrictive and minimizes implementation challenges, which can be important for expanding the fertilizer market within Africa. However, EAC Partner States already have ex ante regulatory approaches in place, which is an important consideration for fertilizer harmonization within the region.

The ECOWAS Fertilizer Regulation includes other good regulatory practices for fertilizer, many of which are noted above. The ECOWAS rules harmonize quality control standards throughout the region by adopting common definitions for fertilizer terms, establishing harmonized packaging and labeling conditions, and benchmarking inspection requirements against international standards like those set in the Analysis Manuals of the Association of Official Analytical Chemists (AOAC).

The ECOWAS 2012 Fertilizer Regulations adopt a number of good practices that will be further developed in the section below. Several of those are worth expanding on here, since they differ from the approach taken in the EAC Fertilizer Bill.

One notable good practice in ECOWAS is adopting a truth-in-labeling approach to quality control of fertilizers, where there are no lists or registries of approved fertilizers for cross-border trade but rather an obligation to comply with each Member State's quality standards. This approach generally is categorized as an *ex post* control that imposes fewer limitations on market access as opposed to an *ex ante* approach where fertilizers have to be registered nationally and/or regionally before they can be traded. A complementary measure to the truth in labeling approach is requiring the licensing and registration of fertilizer producers, dealers, and facilities rather than registration of fertilizers. This way the government still has control over the actors engaged in the fertilizer market, without limiting the types of fertilizer made available. It also reduces the number of required government inspections (e.g., inspection of fertilizer production facilities), rather than requiring one or more inspections for each fertilizer being traded. However, based on stakeholder consultations, this type of approach would not currently be feasible for the EAC region.

The following section benchmarks the EAC Fertilizer Bill against good regulatory practices, including some that are included in the ECOWAS 2012 Fertilizer Regulation. Nevertheless, it is important to note that, as is the case with seed regulations, adopting legal frameworks is only the first step in the harmonization process. Studies show that countries face challenges in the implementation of these frameworks particularly with regard to: "(i) gaps in legal and regulatory frameworks; (ii) lack of knowledge of laws and regulations among stakeholders; and (iii) complicated, duplicative, and time-consuming regulatory processes with

overlapping mandates in fertilizer regulation."[161] Given the different status of fertilizer regulations at the national level, regional regulations could act as minimum standard with which countries should comply; however, having a harmonized regional system does not necessarily mean that every country must have uniform laws and regulations. Regional harmonization usually allows countries to approach implementation of regional rules in various ways as long as they meet the underlying standards.[162]

Good Practices in Fertilizer Regulation

Similar to seed, there are a set of regulatory practices against which the regulatory framework proposed for the EAC can be benchmarked. These incorporate good practices included in the ECOWAS 2012 Fertilizer Regulations and existing EAC Partner State approaches. Also relevant are the *Guidelines for Regional Harmonization* developed in 2017, with the support of AGRA, by NML and AFAP, which contain short and long-term recommendations and follow a set of good practices that could provide useful guidance to the EAC and its Partner States in the context of the EAC Fertilizer Bill.

The text of the draft bill and a draft EAC Fertilizer Policy have been shared for validation, and the section below discusses practices and possible regulatory options that have been considered as these instruments are vetted.

[161] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.
[162] Katrin Kuhlmann, New Markets Lab for the Syngenta Foundation for Sustainable Agriculture. "Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment," September 2015.

Figure 5: Good Practices in the Fertilizer Regulatory System

Source: © 2019 New Markets Lab

Similar to seed, regional fertilizer harmonization efforts include reference to national and regional entities responsible for fertilizer regulation, particularly since a number of EAC Partner States already have national entities responsible for fertilizer in place. Some of the EAC Partner States already have such entities, like Tanzania (the TFRA); others like Kenya are transitioning from an entity that regulates fertilizers among other functions (the Veterinary Services Board) to an entity exclusively dedicated to fertilizer regulation (Fertilizer Board); and others like South Sudan do not yet have a regulatory body in place. The sample text in Box 1 highlights this national regulatory body, taking into account that it could take different forms in different countries.

Box 1: Sample Provision for Designation of a National Fertilizer Regulatory Authority

Designation of National Fertilizer Regulatory Authorities

(1) Each Partner State shall designate an entity which shall serve as the National Fertilizer Regulatory Authority.
(2) The National Fertilizer Regulatory Authorities shall be institutions or departments assigned the relevant functions regarding fertilizer in the Partner States.
(3) The National Fertilizer Authorities may authorize competent entities to perform specified functions under this Act on their behalf.

The current status of national fertilizer regulatory authorities in each of the EAC Partner States include:

- ✓ Tanzania has already established the TFRA as the national regulatory body for fertilizers. [163]
- ✓ Kenya has created the Fertilizer Board of Kenya, although it is not yet operational, and the fertilizer industry is still being regulated by the Veterinary Services Board.[164]
- ✓ In Rwanda, RICA will assume regulation of fertilizers, but it is not yet operational. Regulatory functions are currently being performed by the Rwanda Agriculture and Livestock Inspection and Certification Services (RALIS).
- ✓ Uganda established the Agro Chemicals Board under the Agro Chemicals Control Act to regulate, register, and verify the quality of fertilizers traded.[165] However, Uganda's Act does not establish procedures for these tasks.
- ✓ Burundi has not yet established an entity in charge of regulating fertilizers. However, the Department of Fertilizer within the Ministry of Agriculture currently performs this function, with assistance from the Burundi National Bureau of Standards.
- ✓ South Sudan does not yet have regulations on fertilizers.

[163] Tanzania, The Fertilizers Act, 2009.
[164] Kenya Fertilizer and Animal FoodStuffs Act, Cap 345 revised in 2015; NML Consultations with stakeholders, 2019.
[165] Uganda Agro Chemical Control Act, 2006; NML Consultations with stakeholders, 2019.

EAC Partner States also discussed the appropriate structure for a regional body and determined that a Regional Fertilizer Committee would be most appropriate. The sample text below (Box 2) establishes this committee.

Box 2: Sample Text for Institutional Arrangement at the Regional Level

Institutional Arrangements
Designation of Regional EAC Fertilizer Committee

(1) The Council shall establish an EAC Fertilizer Committee for the Community, which shall be composed of the heads of the National Fertilizer Authorities of Partner States or their representatives, to coordinate fertilizer matters in the region as provided for by the Act.

(2) The EAC Fertilizer Committee designated under (1) shall be responsible for:
- (a) Establishing the EAC Fertilizers List and approving fertilizers to be entered onto the EAC Fertilizers List;
- (b) Developing and reviewing the EAC Fertilizer Quality Control Manuals;
- (c) Recommending EAC fertilizer standards to the Council to be developed and reviewed;
- (d) Handling complaints and proposals on the application and implementation of this Act;
- (e) Assessing compliance of Partner States in implementing this Act and making recommendations to the Council; and
- (f) Recommending to the Council regarding matters required to be prescribed under this Act.

Streamlined Fertilizer Registration Requirements

Registration requirements are common for agricultural inputs and usually involve a three-level registration process: (1) registration of the product, (2) registration of the producer (and sometimes the production facility), and (3) registration of the agro-dealer. While registration can fulfill certain policy objectives, it is not always considered a good regulatory practice, since it can create additional costs and bureaucratic hurdles, which are generally not favored by the private sector. Registration of fertilizer, however, is already required by several EAC Partner States. Stakeholders consulted during the EAC field visits expressed concerns with registration requirements for fertilizers and fertilizer businesses due to lack of clarity in procedures and inconsistencies among different national regulations; however, most stakeholders also stressed the need for streamlining these procedures and not eliminating them. If considered at the regional level, fertilizer registration should be as simple and streamlined as possible, with the fewest number of testing seasons possible and a simple process for renewal. In addition, stakeholders stressed that blends of already registered fertilizer should not be subject to additional registration requirements.

An alternative to fertilizer registration, which is considered an *ex ante* regulatory approach (regulation of the market before market entry), an *ex-post* approach based on truth-in-labeling, similar to the one included in the ECOWAS Fertilizer Regulations (discussed

above).[166] This approach has been followed by countries like Mozambique and at the regional level by ECOWAS in the ECOWAS 2012 Fertilizer Regulation.

Registration of fertilizer is typically accompanied by testing before a fertilizer can be sold on the market and the creation of lists of approved fertilizer products. In addition, many countries also require separate registration of fertilizer entities (dealers, importers, distributors, retailers, exporters, etc.) and fertilizer production facilities. Some of the EAC Partner States have already adopted an ex ante approach to fertilizer markets, including Rwanda, Uganda, and Tanzania. More specifically:

- ✓ Kenya: Currently no registration requirements exist for fertilizers based on the fertilizer regulation, but stakeholders have noted that similar practices are followed in practice.
- ✓ Rwanda: Fertilizer registration is required and administered by RALIS. Fertilizers are tested for a minimum of two crop-growing seasons to assess whether they are safe for human health. Besides product registration, Rwanda requires registration of fertilizer dealers, whether importers, exporters, distributors, or retailers, who must obtain a license from the registrar of agro-chemicals. Rwanda's regulations also require registration of the premises where the fertilizer is manufactured, loaded, sold, stored, and repackaged.
- ✓ Tanzania: Tanzania's regulations require registration of fertilizer, fertilizer dealers, and the premises where fertilizer is manufactured. Fertilizer registration is based on one season of laboratory and field testing, which was recently shortened from three seasons. Tanzania also recently put in place a bulk procurement process for fertilizer importation.
- ✓ Burundi: The government of Burundi does not currently have a regulatory process in place for registering fertilizers. Burundi mainly imports fertilizers and has a bulk procurement process and subsidy programme in place for the importation of fertilizer for farmer crops. The Ministry of Agriculture and Livestock advertises a call for tenders, and fertilizer companies place bids; those that are successful are given licenses to import. Currently, there is a short list of companies that can import farmer-crop fertilizers.
- ✓ Uganda: The Agro Chemicals Board has the mandate to issue fertilizer import and export licenses. However, due to the lack of regulations to guide the Board's activities, the process of licensing, registration, and issuance of import and export permits by the Agro Chemicals Board is not streamlined.
- ✓ South Sudan does not yet have regulations on fertilizer.

[166] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

While there is no precedent on regulation of fertilizer registration at the regional level, stakeholder consultations indicated that this should be one of the areas for harmonization at the EAC level, particularly since several EAC Partner States require fertilizer registration. Registration of fertilizer can be challenging as noted above, yet harmonization of registration requirements is itself a good practice that can lead to a streamlined process where the requirements and procedures to register fertilizer are exhaustive and the degree of discretion is reduced to a minimum.[167] Adopting a simple and transparently applied list or registry of regionally approved fertilizers and streamlining regional fertilizer registration could be ways of streamlining trade within the region. When determining the EAC's approach to regulate registration of fertilizers at the regional level, lessons learned from the seed sector could act as guidance. Consequently, fertilizer lists and registration requirements could be a short-term solution, while a longer-term solution, such as a truth-in-labeling mechanism with some government verification, is developed and implemented.

Stakeholder consultations revealed that EAC Partner States' systems are currently at different stages of development, and there is a lack of trust from country to country. Consequently, streamlining the process for trading fertilizers at the regional level could help facilitate markets. In order to make the process as simple as possible, and taking an approach similar to seed regulatory harmonization, the draft Fertilizer Bill also establishes that fertilizers that have been registered in at least two Partner States can be automatically listed on the EAC Fertilizer List and marketed within the region (See Box 3).

Box 3: Sample Provision for Regional Registration of Fertilizer

Registration of Fertilizer

1) An application for registration of fertilizer shall be submitted to the National Fertilizer Regulatory Authority in the relevant EAC Partner State in accordance with relevant national procedures.

(2) The National Fertilizer Regulatory Authority in the relevant EAC Partner State shall subject fertilizer to testing prior to registration, in accordance with the Regulations under this Act and the relevant EAC standards.

(3) A fertilizer registered in two EAC Partner States shall undergo automatic registration in other EAC Partner States, in accordance with the Regulations under this Act.

Implementation of harmonized standards for fertilizer is of paramount importance for the use of fertilizer across borders. The following is a sample provision on testing that recognizes testing in accordance with harmonized standards, treats fertilizer blends different than new fertilizers, and allows for the establishment of a regional fertilizer testing laboratory.

[167] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

Box 4: Sample Provision for Regional Testing Requirements

Testing of Fertilizer

(1) For a fertilizer not on the National List of Approved Fertilizers, the National Fertilizer Regulatory Authority, or an entity authorized by it, shall test the fertilizer in accordance with the Regulations under this Act.

(2) The National Fertilizer Regulatory Authority shall not subject blends made from fertilizers that are already on the National List of Approved Fertilizer or the EAC Fertilizers List to additional field testing or registration requirements.

(3) The National Fertilizer Regulatory Authority shall not subject fertilizer listed on the EAC Fertilizers List to field or laboratory testing where such fertilizer has already been tested in another Partner State in accordance with the Regulations under this Act.

(4) The Council may designate a fertilizer testing laboratory in a Partner State to conduct testing of fertilizer under this Act.

(5) A laboratory designated under sub section (4) shall operate in accordance with standards and procedures prescribed by the Council under the EAC Quality Control Manual and other relevant measures.

(6) The results of fertilizer testing conducted by a designated laboratory in a Partner State shall be recorded and recognized by the National Fertilizer Authorities of other Partner State.

Because registration of fertilizers is a common practice in the EAC, EAC Partner States requested that it be incorporated into a regional approach. However, regional fertilizer registration should be designed and implemented in a way that facilitates trade and streamlines the registration process across Partner States. Furthermore, the regional rules should also specify the causes for canceling a fertilizer registration, limiting this to certain circumstances only. Provisions for fertilizer registration and lists of approved fertilizers could follow the sample text in Box 5.

Box 5: Sample Provision for National and Regional Lists of Approved Fertilizers

National List of Approved Fertilizer

(1) Each Partner State shall develop and maintain a National List of Approved Fertilizer, which shall include all fertilizers registered by that Partner State.

(2) Partner States shall maintain and update the National List of Approved Fertilizer and notify the EAC Fertilizer Committee of new entries and withdrawals.

Regional Fertilizer List

(1) The Secretariat shall establish and maintain an EAC List of Approved Fertilizers that shall contain fertilizer products that have been registered on the National List of Approved Fertilizers of at least two Partner States.

(2) The EAC List of Approved Fertilizers shall have a description and composition of the fertilizer and the Partner State in which the fertilizer has been registered.

Cancellation, Denial, and Deregistration of Fertilizer

(1) The EAC Fertilizer Committee shall cancel, deny, and deregister a fertilizer from the EAC List of Approved Fertilizers if:

(a) The registrant of such fertilizer has contravened or failed to comply with the terms or conditions for registration as provided for in this Act and accompanying Regulations;

(b) Such fertilizer is not of the composition and efficacy specified in the application for registration, pursuant to the conditions set out in the Regulations under this Act, and, therefore, does not possess the chemical, physical and other properties so specified and does not comply with any requirements that may be prescribed in the Regulations under this Act and the EAC Fertilizer Quality Manual; or

(c) It is contrary to the public interest that such fertilizer remains registered, including that it poses risk to animal and human health, or the environment.

(2) The procedures for cancellation and deregistration of any fertilizer from the EAC List of Approved Fertilizers shall be described in the Regulations under this Act.

Standardized Quality Control Requirements and Cross-Border Trade Measures

Common standards for quality control at the regional level can help assure quality along the entire supply chain and prevent issues such as adulteration and counterfeiting. The EAC Fertilizer Bill could follow the example of ECOWAS and benchmark these standards against international standards like those adopted under the AOAC, the International Organization for Standardization (IOS), and perhaps also standards adopted in other regions in the world. The harmonized standards should cover issues that are common throughout the EAC region like nutrient content and bag weight, as well as tolerance limits.[168] Furthermore, regional rules on quality control should also establish the procedures for inspections (both in-field inspections and laboratory testing). Consistent with existing EAC fertilizer standards, a typical inspection process should include verification of (1) uniform particle size; (2) moisture content; (3) nutrient content; (4) presence and levels of heavy metals like cadmium, selenium, mercury, and arsenic; (5) proper documentation; (6) integrity and

[168] IFDC, "ECOWAS Fertilizer Regulatory Framework: Implications for the Development of Private Sector-Led Supply of Quality Fertilizers in West Arica," Policy Brief. December 2018.

reliability of the bags; and (7) proper and correct labeling.[169] The verification requirements for inspection should track with international standards, existing EAC fertilizer standards, regulations to be developed under the Act, and relevant manuals. Proper implementation of quality standards can also be used as a tracking mechanism to control counterfeit fertilizer.[170] Even without adopting a full truth-in-labeling regulatory approach, truthful labeling should be used as a quality control approach, where inspectors will compare the label and packaging of fertilizer against the adopted standards. Truth-in-labeling can thus operate in two different ways, as a regulatory approach in place of product registration and also as a quality control approach that allows verification of quality standards.

Effectively implementing a quality control system for fertilizer would require efforts at both the national and the regional levels to address potential quality-related issues and harmonized physical inspection procedures. In particular, it would require hiring, training, equipping, and funding fertilizer inspectors and laboratory technicians at the national level, along with implementing laws and regulations to allocate the necessary resources and ensure enforcement of the system.[171] As expressed during the Partner State field consultations, this could present a challenge for some countries.

Highlights from the country level legal and regulatory frameworks on this aspect are noted below:

- ✓ Rwanda: Imported fertilizer is subjected to testing to assess its compliance with Rwanda's fertilizer standards set by the Rwanda Standards Board and based on those of the EAC. RALIS inspectors inspect fertilizer for compliance with quality standards.
- ✓ Tanzania: Fertilizer must be tested based on analytical methods described in the third schedule of the fertilizer regulations. For fertilizer that is new to the market, it must be subjected to testing by TFRA or institutions authorized by the TFRA Director prior to registration for one season, to determine its suitability for use.
- ✓ Kenya: Kenya's major requirement for importation of fertilizer relates to testing and analysis to check whether fertilizer meets the standards set by KEBS. For fertilizer new to the market, the technical committee on fertilizer under KEBS, composed of stakeholders from the fertilizer industry, sits to set standards for that new fertilizer. Samples of the imported fertilizer are taken by authorized inspectors in accordance with the Fertilizer and Animal FoodStuffs (Samples) Regulations and analyzed in

[169] Joshua Ariga, Shannon B. Keating, Katrin Kuhlmann, Nicole M. Mason, and Maria Wanzala-Mlobela, "Creating an Enabling Environment for Private Sector Investment in Fertilizer Value Chains in Sub-Saharan Africa: Empirical Evidence and Knowledge Gaps." IFDC, Michigan State University, AFAP, and NML, December 2018.
[170] Joshua Ariga, Shannon B. Keating, Katrin Kuhlmann, Nicole M. Mason, and Maria Wanzala-Mlobela, "Creating an Enabling Environment for Private Sector Investment in Fertilizer Value Chains in Sub-Saharan Africa: Empirical Evidence and Knowledge Gaps." IFDC, Michigan State University, AFAP, and NML, December 2018.
[171] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

accordance with the Fertilizer and Animal FoodStuffs (Analysis) Rules. After analysis, an importer may be issued an analysis certificate in the form prescribed in the rules.

- ✓ Burundi: Once fertilizer reaches the borders; the Burundi Bureau of Standards tests it to assess compliance with standards on quality.
- ✓ Uganda: Currently, UNBS inspects all imports, including fertilizers, and requires testing done in the country of origin and PVoC attached for fertilizer of FOB above USD 2000. Fertilizers from EAC countries with a mutually agreed upon quality marks (for example, Uganda has an agreement with Kenya and Rwanda, and there is an EAC Proficiency Testing Scheme, whereby lab results are recognized without further testing) are inspected at the border and are exempted from PVoC and further testing at destination.
- ✓ South Sudan does not currently have regulations on quality control for fertilizer.

Further regulations at the EAC level and quality control manuals will detail inspection procedures, sampling method procedures, and requirements for packaging and declaration requirements. Sample provisions for the creation of relevant three manuals are included below:

Box 7: Sample Provision for Quality Control Manuals

Interpretation:

"EAC Fertilizer Quality Control Manual" means the compendium of provisions under a separate instrument describing the modalities and procedures for carrying out the inspection, sampling, analysis, packaging and labelling of fertilizers under the Act, developed in accordance with international standards and best practices, including those under the Association of Official Analytical Chemists (AOAC) and International Organization for Standardization (ISO).

Regional Institutional Arrangements

The EAC Fertilizer Committee designated under (1) shall be responsible for:
[…]

(b) Developing and reviewing the EAC Fertilizer Quality Control Manuals.

In addition, fertilizer regulatory harmonization can include rules on licensing of fertilizer actors as included in the ECOWAS 2012 Fertilizer Regulations. The draft EAC Fertilizer Bill is different, as it leaves details on activity licenses, including the length of the validity of these licenses, to be decided by each Partner State, in line with the sovereignty principle. Within the EAC Partner States activity licenses are valid for the time periods noted below:

- ✓ Kenya: Licenses are awarded for one year.
- ✓ Uganda: Licenses are awarded for one year.
- ✓ Tanzania: Licenses are awarded for three years.
- ✓ Rwanda: Licenses are awarded for five years.
- ✓ Burundi: No regulations have been adopted on the matter.
- ✓ South Sudan: No regulations have been adopted on the matter.

It should be noted that, even though the application requirements for a license can be further developed through national regulations, there should be a distinction between applying for a new license and renewing an existing license. Those dealers that already have a valid license and seek renewal should be subject to an expedited process to maintain the efficiency of the system. EAC Partner States should also mutually recognize licenses issued in other Partner States to avoid duplicity of requirements within the region. When transparently applied, licensing requirements can be beneficial since they can help create a legal bond between the regulatory authority and the fertilize trader, which ensures that the trader respects fertilizer regulations (such as quality measures) and provides a channel for enforcement.[172]

Right to Appeal and Confidentiality

The right to appeal and confidentiality is another important good practice that should be considered when designing regional rules. Given that many of the provisions included in the EAC Fertilizer Bill and in other similar regulations involve administrative procedures where public entities have the power to determine who can participate in the fertilizer market and under which conditions, the right of market actors to appeal these decisions is critical. The right to appeal should be included within the regional regulations, and each Partner State should internally designate competent authorities and procedures to guarantee that all actors are given fair and transparent treatment when applying for a license or registration. In that same regard, the regulations should establish an obligation for all those involved to maintain confidentiality of any information that might be sensitive throughout the application process. The following provision is included in the draft EAC Fertilizer Bill and is similar to the relevant provision in the ECOWAS 2012 Fertilizer Regulations.

Box 8: Sample Provision for Right to Appeal

Right to Appeal

In each Partner State, manufacturers, importers, and distributors shall have a right to appeal before the Appellate Authority against any decision taken by the licensing authority regarding issue of license, renewal of the same, issue of duplicate license, and against an analysis report of a laboratory or any other grievances, under provision of the Act and its Regulation.

[172] Joshua Ariga, Shannon B. Keating, Katrin Kuhlmann, Nicole M. Mason, and Maria Wanzala-Mlobela, "Creating an Enabling Environment for Private Sector Investment in Fertilizer Value Chains in Sub-Saharan Africa: Empirical Evidence and Knowledge Gaps." IFDC, Michigan State University, AFAP, and NML, December 2018.

In addition, regulations specific to particular activities should include a list of definitions that should be taken into account when interpreting legal instruments. These provisions are usually included at the beginning of a regulation or act and tend to reference international definitions to promote harmonization. The EAC Fertilizer Bill includes such a provision with terms that have been defined in similar national regulations and other regional regulations like the ECOWAS 2012 Fertilizer Regulation. The draft EAC Fertilizer Bill also includes a list of seventeen definitions that should be applied consistently within the Partner States.

A provision on the elimination of tariffs and duties on fertilizers is also included in the EAC Fertilizer Bill. Even though, according to the EAC Common External Tariff of 2017, fertilizers are exempted from any tariffs, stakeholders expressed that some countries still impose duties on fertilizers. Adding a provision that requires Partner States to eliminate such tariffs and duties could increase certainty and create an additional legal basis to guarantee the elimination of such measures within the region. Finally, adding a provision on penalties and enforcement of laws and regulations could facilitate the enforcement of regional regulations at the national level. Penalties should be applied at the country level by the National Regulatory Fertilizer Authority.[173]

Finally, looking at longer-term regulatory options for that would enable trade and use of fertilizers in the region is useful. Even though these options may not be feasible to implement in the shorter term, they could be longer-term goals.

1. Shift to a Truth-in-Labelling Approach (with Notification). As mentioned above, the truth-in-labeling approach is an *ex post* approach, as exemplified in the ECOWAS 2012 Fertilizer Regulation, and could be a more transparent and possibly more effective way to regulate regional movement of fertilizers. This approach is based on enforcement and assurance of market quality, and hence will require alignment and capacity building at the national level to ensure that the system is harmonized and functions properly. Under such an approach, countries would no longer maintain lists of authorized fertilizers or require registration of fertilizers.[174] However, governments could still maintain some sort of notification to assist with enforcement as noted below.
2. Public subsidies also affect trade in fertilizer. Even though these should not be regulated at the regional level, differences in subsidy programs within the region can

[173] Joshua Ariga, Shannon B. Keating, Katrin Kuhlmann, Nicole M. Mason, and Maria Wanzala-Mlobela, "Creating an Enabling Environment for Private Sector Investment in Fertilizer Value Chains in Sub-Saharan Africa: Empirical Evidence and Knowledge Gaps." IFDC, Michigan State University, AFAP, and NML, December 2018.

[174] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.

lead to variations in price, which can discourage regional harmonization. The same is true of bulk procurement programs.

3. Free Movement of Fertilizer Cross-Border, Including Transport. As established in the ECOWAS 2012 Fertilizer Regulations, fertilizers that comply with regional quality standards should be traded freely across the region. National regulations could still require a form of notification or registration with national authorities, not as a requirement for production and distribution, but rather as a control mechanism. Additionally, regional harmonization efforts should aim to reduce transport costs by reducing or removing border taxes, roadblocks, and escort systems; introducing one-stop border processes; and improving trade corridors.[175]

Implementation of good practices, including the long-term options noted above, at the regional and national levels will, of course, require the investment of resources and national and regional capacity building initiatives. This process will take time, coordination, and cooperation. However, following good practices, including as noted in this section, could help expand the fertilizer sector within the EAC and further develop agricultural markets within the region. Given larger harmonization initiatives and the fact that most of the EAC countries are members of other RECs, the EAC harmonization efforts could also have positive spill-over effects within the larger region and at the continental level.

[175] New Markets Lab in collaboration with the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) through the U.S. Agency for International Development (USAID), "Guidelines for Regional Harmonization of Fertilizer Regulations in COMESA", 2017.