



Working Paper

Seed Policy Harmonization in COMESA AND SADC: The Case of Zambia

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This Case Study is part of a series of research on regional seed policy harmonization in Africa, designed to assess the process for implementing seed regulatory systems that can better deliver improved seed varieties to farmers. It is part of the Syngenta Foundation's Seeds2B initiative. If you would like to comment on this case study, please reach out to the authors (Yuan Zhou yuan.zhou@syngenta.com or Katrin Kuhlmann kkuhlmann@newmarketslab.org).

Seeds2B 

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Executive Summary

High-quality seed is fundamental to enhancing agricultural productivity, increasing food security, and improving rural livelihoods, and the legal and regulatory environment has a central role in the availability and accessibility of quality seed. Together, policies, laws, and regulations make up the enabling environment for seed,² and much work is being done to build these systems at both the national and regional levels. Yet, as this Case Study and others by the authors indicate, implementation of these legal and regulatory frameworks remains an ongoing process and will require sustained focus and different interventions over time.

This Case Study centers on improvements in Zambia’s regulatory system for seed and how Zambia is implementing commitments under the Common Market for Eastern and Southern Africa (COMESA) and Southern African Development Community (SADC) seed harmonization frameworks. It is the fourth in a series of Case Studies produced by the Syngenta Foundation for Sustainable Agriculture (SFSA) and its partner the New Markets Lab (NML) under SFSA’s Seeds2B program. The Seeds2B Case Studies are designed to evaluate the process for implementing regional seed regulatory initiatives at the national level in a way that can better deliver improved seed varieties to farmers. The Case Study series also includes Kenya (a member of both the East African Community (EAC) and COMESA), Zimbabwe (a member of both COMESA and SADC), and Ghana (a member of the Economic Community of West African States (ECOWAS)). Each Case Study in this series has been developed based on research and stakeholder consultations, and, while each is designed to stand alone, the series enables comparison of regulatory practices across countries. Over time, an in-depth, comparative approach will strengthen understanding of how implementation of regional seed initiatives can contribute to a well-functioning seed regulatory system. In addition to the Case Studies, the project partners have developed a regulatory toolkit under Seeds2B, which includes an ongoing set of Test Cases with companies and research institutes to work through the regulatory process for regional variety release and registration step-by-step and document progress and challenges.

² It is helpful to briefly note the difference between law, regulations, and policy; these three terms will be used in the context of the enabling environment. Laws (or acts) stem from a parliamentary process and create a framework for governing the market. Regulations implement laws and are usually created through administrative action without the need for a parliamentary process. Policies, which are the broadest category of measures within the enabling environment, provide guidance to stakeholders and government officials on what objectives laws and regulations should seek to achieve but are normally not legally binding instruments on their own. In addition, countries may use other measures – such as guidelines, administrative orders, and procedural manuals – to supplement law, regulation, and policy. Although a comprehensive legal and regulatory system on paper is important to a successful seed system, the implementation of laws and regulations will determine the effectiveness of the system in practice.

Zambia is notable in terms of both the strength of the national seed industry and the level of development of the country's regulatory system for seed. Zambia has also made strides in implementing regional seed rules. Due to amendments to Zambia's Seeds Regulations, which entered into force in March of 2018,³ Zambia is one of the few countries out of the twenty-one COMESA members that has taken action to bring its system into alignment with the COMESA Regional Rules.⁴ As this series has revealed, regional harmonization requires more than alignment with regional laws and regulations on paper, and this case study highlights good regulatory practices, in Zambia and other African countries, to further enhance implementation of regional rules.

Several key recommendations have emerged to strengthen Zambia's seed system and address remaining implementation gaps.

- ***Incorporate Clear References to Regional Protocols*** in national legislation as a good regulatory practice to facilitate harmonization with regional seed frameworks and necessary first step towards alignment with regional rules. Zambia's revised Seeds Regulations incorporate this good practice.⁵
- ***Streamline and Increase Transparency Around Regulatory Processes for Seed*** along the entire seed value chain. While Zambia's seed system is reportedly relatively efficient, improvements are needed in seed import and export procedures.
- ***Implement National Laws and Regulations to Align with the COMESA and SADC Seed Systems***, working in close collaboration with stakeholders along the entire seed value chain to ensure those systems work well in practice. Zambia has made strides in this area, but additional attention is needed.
- ***Apply Good Practices from Within Sub-Saharan Africa to Improve Quality and Build Capacity Within the Seed Sector***, including through accreditation of private seed inspectors (Zambia has a good model in this area), enhancing capacity of public laboratories, and maintaining quality declared seed (QDS).
- ***Improve Enforcement of Counterfeit Seed***, including through increased collaboration with private sector stakeholders (around labeling, for example) and adoption of good practices to combat fake seed.

³ Statutory Instrument No. 23 of 2018, "The Plant Variety and Seeds Regulations, 2018, Government of Zambia, March 29, 2018.

⁴ The other countries that have taken action to align with COMESA are Kenya, Uganda, Rwanda, Burundi, Zimbabwe, and Malawi. "Seed Laws Aligned to COMESA," Zambia Daily Mail Limited, June 7, 2017.

⁵ Article 35(1)b, Plant Variety and Seeds Regulations (2018).

- **Increase Regional Regulatory Collaboration and Mutual Recognition** to enhance cooperation among regulators and improve mutual recognition of each other's procedures and results.
- **Facilitate Cross-Border Trade in Seed, Germplasm, and Test Data** in order to underpin regional market growth, implement COMESA and SADC rules, and strengthen crop breeding efforts.
- **Improve Knowledge of National and Regional Rules Related to Seed** and enhance the ability of diverse stakeholders to benefit from the formal seed system.

Overview of the Zambian Seed System

Agriculture is the backbone of the Zambian economy, making up 9.2 percent of its Gross Domestic Product (GDP).⁶ Overall, two-thirds of households are agricultural, and the sector employs 85 percent of the population based on data from 2016.⁷ Zambia is endowed with abundant water resources and arable land – 40 percent of the water in Central and South Africa is within Zambia, and 58 percent of the land in Zambia is estimated to have medium to high yield potential.⁸ Currently, only 31.7 percent of Zambia's land mass is used for agriculture, indicating significant potential for agricultural growth.⁹ Crops account for 65 percent of Zambia's agricultural GDP. Important crops include corn, sorghum, rice, peanuts, sunflower seeds, vegetables, and cassava.¹⁰ Maize, sorghum, and pearl millet are among the most important staple crops, with maize and cassava contributing over three quarters of annual crop production.¹¹ For seed, most breeding has centered around hybrid maize, although rice, groundnut, and beans are also priorities. While maize is an important crop for Zambia's agricultural sector and food security, many stakeholders note a gap in the seed system for other important food crops with high nutritional value. This can result in a lack of interest among farmers and poor access to improved varieties of seed for food crops that do not receive sufficient focus by private companies.¹² The African Seed Access Index (TASAI) reports the main

⁶ "Zambia." The World Factbook. 3 May 2017. <https://www.cia.gov/library/publications/the-world-factbook/geos/za.html>.

⁷ "Zambia." The World Factbook. 3 May 2017. <https://www.cia.gov/library/publications/the-world-factbook/geos/za.html>.

⁸ "The National Agriculture Policy 2012-2030." Ministry of Agriculture and Livestock, Republic of Zambia. www.g-fras.org/en/.../australia-22.html?...national-agriculture-policy-2012-2030.

⁹ "Agriculture." Zambia Development Agency. Web. 17 May 2017. <http://www.zda.org.zm/?q=content/agriculture>.

¹⁰ "Zambia." The World Factbook. 3 May 2017. <https://www.cia.gov/library/publications/the-world-factbook/geos/za.html>.

¹¹ Hamukwala, Priscilla; Tembo, Gelson; Erbaugh, J. Mark; and Larson, W. Donald. *Improved seed variety value chains in Zambia: A missed opportunity to improve smallholder productivity*. African Journal of Agricultural Research Vol. 7(34), pp. 4803-4818, 4 September 2012.

http://www.academicjournals.org/article/article1380877153_Hamukwala%20et%20al.pdf

¹² ISSD Africa. "ISSD Briefing Note - September 2012 Zambia Seed Sector Assessment". Web.

seed imports are vegetables and sweet potatoes, as well as parental lines, of maize from South Africa, the Netherlands, Sweden, Zimbabwe, Malawi, and Australia.¹³ Within Africa, Zambia is one of the largest exporters of seed.¹⁴ The most common seed export is maize. Seed is traded heavily with Kenya and Tanzania, as well as Rwanda, Malawi, Mozambique, South Africa Botswana, and Lesotho. The Democratic Republic of Congo is also emerging as a market with significant potential.¹⁵ National companies are involved in the production, multiplication, marketing, and distribution of a number of food and cash crops, such as maize, beans and soybean; international companies focus mainly on hybrid maize and other high value crops such as wheat and soybean. The out-grower arrangements used to produce export commodities are formal arrangements between small-scale farmers and agro-processors for large export commodities of improved varieties, such as cotton, tobacco, and sugar cane.

Although Zambia's agricultural sector has had a steady growth rate of about 1.5 percent per annum, it falls behind Zambia's overall real GDP growth rate (3 percent) and population growth rate (2.8 percent). Agriculture's share of GDP decreased from 12.5 percent in 2009 to 9.2 percent in 2016, largely due to expansion of the overall economy and relatively high growth in other sectors such as mining. In the review of the National Agricultural Policy 2004 – 2015, Zambia's Ministry of Agriculture and Livestock noted low productivity as a major cause of slow agricultural growth and identified access to agricultural inputs as a key mechanism to increasing crop yield and reducing food insecurity.

Until 1994, Zambia's seed sector was governed by the Plant Variety and Seeds Act (1967), which only allowed the participation of public entities. The Plant Variety and Seeds Act was amended in 1994 and 1995 to allow for private sector participation. In 1999, the first national seed policy was developed and later embedded in the National Agricultural Policy 2004-2015. Currently, the participation of both public government agencies and private national and international seed companies characterize Zambia's seed sector. The Seed Control and Certification Institute (SCCI) under the Ministry of Agriculture and Livestock is the primary institution governing Zambia's seed system. In the private sector, national and international seed companies are the main distributors of food and cash crop seeds as well as exporters of hybrid maize seed.

¹³ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

¹⁴ *Agribusiness Indicators: Zambia*. World Bank, December 2012. <http://documents.worldbank.org/curated/en/481731468166490328/pdf/825080WP0ABIZa00Box379865B00PUBLICO.pdf>.

¹⁵ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

Zambia's seed sector is well-developed, with 50 seed companies registered as of 2016.¹⁶ According to TASAI, there are fewer agrodealers in Zambia (450 total) than in other comparable countries such as Zimbabwe or Kenya.

Plant Breeding and Varietal Improvement

Public institutions and private companies may undertake plant breeding, but the private sector carries out most of the breeding in Zambia. International seed companies conduct breeding of their own varieties, while national seed companies depend heavily on public-sector breeding research. The Zambia Agriculture Research Institute (ZARI), with its research stations, is the primary public body that undertakes varietal development and improvement research on a number of food and cash crops. In addition to ZARI, other semi-autonomous entities engaged in breeding include the University of Zambia (UNZA), Cotton Development Trust (CDT), and Golden Valley Agricultural Research Trust (GART).¹⁷ The public sector conducts breeding activities either through development of pre-basic or breeder seeds by ZARI or by obtaining germplasm from international institutions. To increase the number of breeders in Zambia, the International Maize and Wheat Improvement Center (CIMMYT) conducted training on maize breeding methods in 2015 for 38 maize breeders from the public and private sectors, including 12 women.¹⁸

TASAI reported there were 26 active breeders in Zambia in 2017, including 17 maize breeders, 5 rice breeders, 3 groundnut breeders, and one bean breeder. Of these, there are 11 active breeders from ZARI, compared to 15 private sector representatives engaged in breeding.¹⁹ Between 2014-16, TASAI reports that 44 varieties were released, including maize (27 varieties), rice (three varieties), groundnut (two varieties), and beans (two varieties).²⁰

¹⁶ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

¹⁷ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. <http://afsta.org/wp-content/uploads/documents/ZAMBIA%20SEED%20SECTOR%20BASELINE%20STUDY.pdf>.

¹⁸ Cosmos Magorokosho, et. al. "CIMMYT Empowers a New Generation of Maize Breeders in Zambia." International Maize and Wheat Improvement Center (CIMMYT), October 28, 2015. <http://www.cimmyt.org/cimmyt-empowers-a-new-generation-of-maize-breeders-in-zambia/>.

¹⁹ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

²⁰ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

ZARI publishes annual reports, and research results developed by ZARI are openly accessible by all seed actors through the Extension Service Department. Civil society organizations interviewed suggested that the budget for research and extension services should be increased to support higher productivity among smallholder farmers. Notably, public research and extension services depend upon government funding.

Variety Maintenance and Early Generation Seed Multiplication

Breeders of quality seed must keep nucleus seed, or very high-quality seed, to produce and multiply in order to maintain the varietal characteristics throughout generations of seed. Early generations of seed are called pre-basic and basic seed (or sometimes breeder and foundation seed). To multiply early generation seed, the producer must have a high degree of technical expertise as well as the right equipment and infrastructure. Research organizations primarily produce and distribute foundation seed for new crop varieties and depend upon the private sector or registered seed companies to multiply and market seed.²¹ The breeder often oversees the multiplication of early generations of seed. Seed multiplication can also require large tracts of land. In Zambia, private sector companies typically produce foundation seed,²² which is in contrast to most other countries in sub-Saharan Africa.

Zambia has a national seed bank, the Zambia National Plant Genetic Resources Centre (NPGRC), based at the Mount Makulu Research Centre near Chilanga, under the Ministry of Agriculture and Livestock.²³ A National Plant Genetic Resources Committee runs the NPGRC and coordinates among stakeholders.²⁴ Zambia's NPGRC stands out within the region due to its DNA-fingerprinting system that can categorize and track germplasm. The NPGRC also has crop working groups that are made up of crop experts and provide technical support to the Variety Release Committee (VRC). In 2014 there were three such groups.²⁵ In addition to the NPGRC, Zambia houses the SADC Plant Genetic Resources Center (SPGRC), which is an autonomous,

²¹ Katrin Kuhlmann. *Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment*. Written for the Syngenta Foundation for Sustainable Agriculture, 2015.

https://docs.wixstatic.com/ugd/095963_e897ed98f4b54238b44d0362c83434b6.pdf

²² Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

²³ Southern African Development Community (SADC). "Zambia National Plant Genetic Resources Centre" SADC Plant Genetic Resources Centre. Web. 3 May 2017. <http://www.spgrc.org.zm/index.php/zambia-mainmenu-36>

²⁴ Southern African Development Community (SADC). "Zambia National Plant Genetic Resources Centre" SADC Plant Genetic Resources Centre. Web. 3 May 2017. <http://www.spgrc.org.zm/index.php/zambia-mainmenu-36>

²⁵ Southern African Development Community (SADC). "Zambia National Plant Genetic Resources Centre" SADC Plant Genetic Resources Centre. Web. 3 May 2017. <http://www.spgrc.org.zm/index.php/zambia-mainmenu-36>

non-profit organization established in 1988 under SADC.²⁶ The SPGRC coordinates among the SADC members' national plant genetic resources centers, provides technical support and training to these centers, and maintains a collection of plant genetic resources for SADC members. The SPGRC is also located at the Chalimbana Research Station.

Formal and Informal Seed Delivery Systems

Like other countries in sub-Saharan Africa, Zambia has a formal seed system, which is regulated by the government and focuses on breeding, producing, and selling certified seeds by registered seed companies. In parallel, an informal seed system exists which is made up of unregistered seed producers. In the informal seed system, farmers conserve, multiply, and exchange seeds of food and subsistence crops using a mixture of barter and cash.²⁷ Informal systems of seed provision are important mechanisms by which farmers produce seed of different genes, which are necessary to select, improve and conserve traditional varieties that are well adapted to the local environment where they live. Local farmers' communities are an important source of readily available, affordable, and good quality seed.

Through the QDS system, local farmers can collect, improve, and sell locally developed varieties that meet the required standards, although such seed may not qualify under the seed certification process. Of Zambia's registered seed companies, 10 produced certified seed and 7 produced QDS, while 33 were seed trader rather than producers.²⁸ QDS is seed that has undergone quality control measures in compliance with QDS quality requirements; often QDS is considered a locally-based and less stringent alternative to seed certification. The seed is still subject to inspection and certification, but the QDS requirements are less demanding than those for formal certified seed. Many stakeholders view QDS as a bridge between the formal and informal seed sectors. Zambia has maintained a QDS system alongside formal certification for some time, and QDS is often viewed as being less cumbersome for small seed producers. However, one stakeholder the authors met with in the development of this case study indicated that there might be an increasing shift away from QDS and towards broader application of the formal certification system as Zambia's application of the seed certification schemes under the Organisation for Economic Co-operation and Development (OECD) proceeds. Notably, QDS systems are not incompatible with the OECD Seed Schemes. Although the OECD Seed Schemes do not recognize QDS seed as a formal seed class, QDS systems are still permitted as part of an

²⁶ Southern African Development Community (SADC). "SPGRC" SADC Plant Genetic Resources Centre. Web. 3 May 2017. <http://www.spgrc.org.zm/spgrc-mainmenu-31>

²⁷ ISSD Africa. "ISSD Briefing Note - September 2012 Zambia Seed Sector Assessment". Web.

²⁸ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

OECD-aligned seed system. The OECD and FAO have stressed the importance of QDS seed as a way to help transition stakeholders, particularly with limited capacity, from the informal sector to the formal sector and ensure that the resulting seed from QDS systems is of satisfactory quality.²⁹ For example, since 2008, the OECD has been working with CIMMYT and ZARI to develop high quality seeds from drought-tolerant maize through the Drought Tolerant Maize for Africa (DTMA) project. CIMMYT provides the materials and maintains the lines. DTMA varieties include drought-resistant maize seeds and bio-fortified orange maize seeds.

Zambia’s formal seed system is comprised of the Ministry of Agriculture and Livestock, SCCI, ZARI (and its research centers), the NPRGC, and seed companies. Companies active in Zambia include SeedCo, Pannar, Kamano, MRI, and ZamSeed (see Table 1 below).³⁰ The Zambia Seed Trade Association (ZASTA) plays an important role in educating its 19 members and coordinating between the public and private sector seed stakeholders.³¹

Table 1: Key Players in the Zambian Formal Seed Sector

ROLE	KEY PLAYERS
Research and breeding	Zambia Agriculture Research Institute (ZARI), seed companies, CGIAR, International Maize and Wheat Improvement Center (CIMMYT), International Center for Tropical Agriculture (CIAT), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT))
Variety release and regulation	Seed Control and Certification Institute (SCCI)
Seed production and processing	Local seed companies, multinational corporations
Education, training, extension	Seed companies, Zambia Seed Trade Association (ZASTA), agro-dealers
Distribution and sales	Seed companies, agro-dealers

Source: Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017. The African Seed Index (TASAI)*, September 2017. Web.

²⁹ *OECD Seed Schemes: A Synthesis of International Regulatory Aspects that Affect Seed Trade*. OECD, September 2012.

³⁰ Hamukwala, Priscilla; Tembo, Gelson; Erbaugh, J. Mark; and Larson, W. Donald. *Improved seed variety value chains in Zambia: A missed opportunity to improve smallholder productivity*. *African Journal of Agricultural Research* Vol. 7(34), pp. 4803-4818, 4 September 2012.

http://www.academicjournals.org/article/article1380877153_Hamukwala%20et%20al.pdf

³¹ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017. The African Seed Index (TASAI)*, September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

Legal and Regulatory Framework

Zambia regulates the seed sector through a number of legal instruments, including the Plant Variety and Seeds Act (Cap 236; Seeds Act), Plant Variety and Seeds Regulations (amended in 2006 and 2018; Seeds Regulations), Plant Breeder's Rights Act (no. 18 of 2007), and Customs and Excise Act (Cap 322). Zambia stands out in the region due to several good regulatory practices, including the accreditation of private sector inspectors and laboratories to assess and test seeds. The National Agricultural Policy 2004-2015 also contains Zambia's seed policies.³² According to the Second National Agricultural Policy of Zambia 2016, Zambia is working to implement effective enforcement of the laws and regulations, in part through revisions and updates to the legal framework; however, stakeholders noted that reform efforts have moved slowly due to the legislative bureaucracy in the country.³³ Nonetheless, Zambia did amend its Seeds Regulations in 2018, and the reform process presents opportunities to support the modernization of Zambia's seed sector, fill existing gaps in the legislation, and better align with regional frameworks and international best practices.

Integration with regional seed regulations was a priority for many of the companies engaged during field consultations. Notably, the private sector was involved in the reform drafting process for the new Seeds Regulations, which integrate regional variety release, certification, inspection, and labelling measures. However, civil society organizations have previously voiced concerns that the reforms did not adequately address issues confronted by small stakeholders .

As noted, SCCI is the primary institution governing Zambia's seed system, which is headquartered in Chilanga south of Lusaka. SCCI is involved in all regulatory processes for seed. For variety registration and release, SCCI administers seed variety tests for distinctness, uniformity, and stability (DUS) and national variety release trials (NVRT) and maintains the national variety catalogue. SCCI also serves as the Secretariat of the VRC, which reviews the results of the variety tests and approves or denies release of new varieties. The Seeds Act (Cap 236) does allow parties who are dissatisfied with the enforcement of the formal seed system an option to appeal decisions of the SCCI to the Minister of Agriculture.

SCCI is also responsible for protection of plant breeders' rights and farmers' and community rights; overseeing seed multiplication and certification processes; enforcing seed quality standards to facilitate seed trade; and monitoring quarantine and other seed-related issues,

³² Seed System Security Assessment Eastern Zambia, USAID. December 2013. <http://seedssystem.org/wp-content/uploads/2014/03/SSSA-Zambia-2013.pdf>

³³ *Second National Agricultural Policy of Zambia 2016*. Government of the Republic of Zambia, (26). 2016. <http://cbz.org.zm/public/downloads/SECOND-NATIONAL-AGRICULTURAL-POLICY-2016.pdf>.

such as germination and purity.³⁴ In addition to certified seed, QDS is permitted and regulated by SCCI.

Similar to other countries in sub-Saharan Africa, Zambia has an extensive permitting and licensing system for seed growers, producers, traders, cleaners, testers, inspectors, and sellers. In addition to research and breeding of public varieties, ZARI supplies phytosanitary certificates, and the Trade and Entrepreneurship Unit in the Department of Marketing under the Ministry of Agriculture and Livestock issues official import permits.

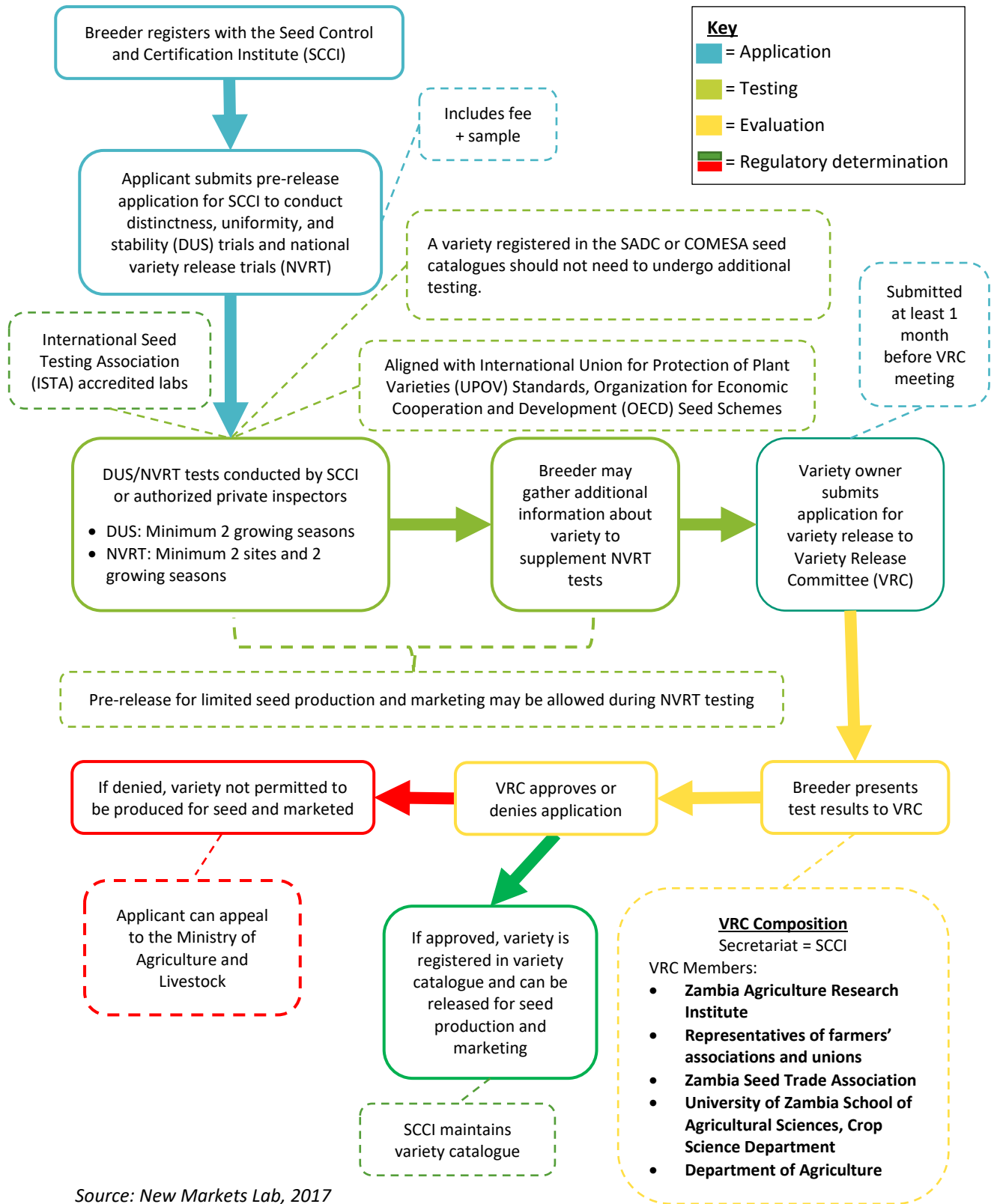
Variety Release and Registration

Applicants for variety pre-release and release must apply to the VRC twice, and applications are received by SCCI in its role as the VRC Secretariat. The VRC sets its own guidelines, which are adapted over time. While stakeholders noted that yield is the primary consideration for whether a variety is approved for release, there may be more flexibility with Zambia's VRC, perhaps paving the way for less traditional varieties. The application for pre-release requests the VRC to conduct the DUS and NVRT, the latter of which determine the Value for Cultivation and Use (VCU) of the variety.³⁵ Applicants must include the application fee and a sample of the variety with the application. Fresh samples need to be provided for each season of testing and must meet crop-specific requirements outlined in the Procedures for Variety Release developed by SCCI.

³⁴ Plant Variety and Seeds Act (CAP 236); See also B. Nakaponda, *ISSD Briefing Note: Zambia Seed Sector Assessment*. ISSD Africa, September 2012, Web; See also "SCCI" Ministry of Agriculture and Livestock, http://www.agriculture.gov.zm/index.php?option=com_content&view=category&id=98&Itemid=1605&limitstart=1

³⁵ SCCI. "Variety Registration, Testing, and Protection (page 1 of 2)," 3 May 2017, http://www.scci.gov.zm/index.php?option=com_content&view=article&id=49&Itemid=55.

Figure 1: Variety Release and Registration Process in Zambia



Source: New Markets Lab, 2017

The NVRTs are carried out at “two sites in each agro-ecological zone for a minimum of two growing seasons.”³⁶ DUS tests are carried out at one site for a minimum of two growing seasons.³⁷ The NVRTs and DUS tests may be conducted concurrently. SCCI carries out the DUS tests in alignment with the International Union for Protection of Plant Varieties (UPOV) guidelines.³⁸ Although Zambia is not a member of UPOV (nor OECD, although it follows the OECD Seed Schemes for certification and has an OECD-aligned system), it has contacted both UPOV and OECD to gain membership. Zambia is a member of the International Seed Testing Association (ISTA) and has ISTA accredited labs. Notably, alignment with international standards, including UPOV, OECD, and ISTA are requirements under the harmonized seed frameworks of both COMESA and SADC.

Once testing has been conducted, and at least one month before the VRC meeting, an application for release (Form 28 of the 2018 Seed Regulations) must be submitted, which contains information on the breeding methods, reason for application, DUS and NVRT test results from SCCI, and whether the variety has been released in any other country. Applicants are required to provide three copies of the application and may also provide any additional material they wish to provide the committee. The VRC then reviews the test data and application for release and determines whether to approve the release of the new variety.³⁹ The process for variety registration and release is depicted in Figure 1 above.

The Procedures of Variety Release state that additional information, such as agronomic or market value, can accompany applications. Applicants must present the case for release for each variety under consideration. The VRC notifies applicants of the release decision within two weeks of the meeting and records approved varieties in the Variety Registrar, which is maintained by SCCI as Secretariat of the VRC. The date of the VRC meeting is the official release date. The average length of the variety registration process is two years, but it reportedly can last as long as three years.⁴⁰

³⁶ SCCI. “Variety Registration, Testing, and Protection (page 2 of 2).” Web. 3 May 2017.

http://www.scci.gov.zm/index.php?option=com_content&view=article&id=49&Itemid=55&limitstart=1

³⁷ SCCI. “Variety Registration, Testing, and Protection (page 2 of 2).” Web. 3 May 2017. See also Seed Control and Certification Institute. *Procedures of Variety Release in Zambia*. Ministry of Agriculture and Livestock, Nov 18, 2009.

³⁸ Ministry of Agriculture and Livestock. “Seed Control and Certification Institute: Key Programmes at SCCI.” Web. 3 May 2017. http://www.agriculture.gov.zm/index.php?option=com_content&view=article&id=134:key-programmes-at-scci&catid=136:scci-key-programmes&Itemid=1605.

³⁹ SCCI. “Variety Registration, Testing, and Protection (page 2 of 2).” Web. 3 May 2017.

http://www.scci.gov.zm/index.php?option=com_content&view=article&id=49&Itemid=55&limitstart=1

⁴⁰ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

According to stakeholders, the VRC meets twice per year and is properly financed so that meetings can be held regularly without cancellation. The Procedures of Variety Release state applicants should submit applications for release of seeds for irrigated crops by March 31, and the VRC makes decisions by the following February. Likewise, applicants should submit applications for seeds of rain-fed crops by October 15, and the VRC makes release decisions by the following September. According to TASAI, companies are reportedly content with the current process, despite the length.⁴¹ Stakeholders echoed this sentiment during consultations, and companies reported that the process was clear and that the VRC met regularly.

Different varieties of crops have been evaluated, released, and registered for commercial production in Zambia, including: maize, wheat, sorghum, rice, pearl millet, finger millet, Irish potato, cassava, sweet potato, groundnuts, beans, peas, cowpea, pigeon pea, soybeans, sunflower, green gram, bambara nuts, guar, tobacco and cotton. According to TASAI, the age of the oldest rice varieties was 7 years in 2016, while maize and beans were 24 and 18 years, respectively. Notably, the oldest age for groundnut varieties was 62 years. However, the newest varieties for all four crops were only one year old. According to TASAI, these variances may suggest that some farmers are still hesitant to switch to improved varieties.⁴² Under SADC, varieties entered in the regional catalogue are valid for only 20 years. While Zambia does not have such a limitation, it may need to consider adding similar language in order to conform with SADC.

Notably, local farmers' varieties tend to be diverse and constantly evolving,⁴³ thus it can be a challenge for such varieties to pass the DUS test⁴⁴ (which requires uniformity and distinctness), regardless of whether they are of high quality and highly commercial. As a result, farmers' local varieties usually fail to qualify under the variety release system and cannot be certified for sale. Reforming the legal framework to allow for additional novel systems to record local lineages would help ensure quality local seed supply and biodiversity. This would open the door for greater formal recognition of these varieties, particularly if scientific solutions like gene fingerprinting are used. Recognizing these varieties will be an important step towards fulfilling

⁴¹ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

⁴² Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

⁴³ La Via Campesina, *Seed Laws That Criminalize Farmers: Resistance and Fight Back*, March 2015. <https://www.grain.org/article/entries/5142-seed-laws-that-criminalise-farmers-resistance-and-fightback.pdf>.

⁴⁴ Michael Halewood and Isabel Lapena, *Farmers' Crop Varieties and Farmers' Rights: Challenges in Taxonomy and Law*, Routledge 2016. https://www.biodiversityinternational.org/fileadmin/user_upload/Farmers_crop_varieties-Halewood.pdf.

obligations under international treaties like the Nagoya Protocol and International Treaty on Plant Genetic Resources for Food and Agriculture.

Further, the Seeds Act does not contain details about the variety registration and release rules, rather they are found on the SCCI website and in the Procedure for Variety Release in Zambia and the new 2018 Seed Regulations, which are only available by a request to SCCI. This makes information on the process difficult to find, as the website is not always available, and it is unclear whether the measures can be accessed without a formal inquiry. Sharing the Procedure for Variety Release in Zambia more widely would increase transparency and certainty around the rules and help companies and breeders navigate the system. This could be done alongside alignment with regional measures.

In addition, now that Zambia has aligned its national seed system with the COMESA and SADC frameworks, a variety entered in either the COMESA or SADC regional variety catalogue should be able to be released and marketed in Zambia without additional testing.⁴⁵ However, the procedures are still new, so it is not yet clear how they will work in practice. Further information about the experience of seed companies in Zambia will help shed light on the level of practical implementation of these regional rules.

Seed Certification

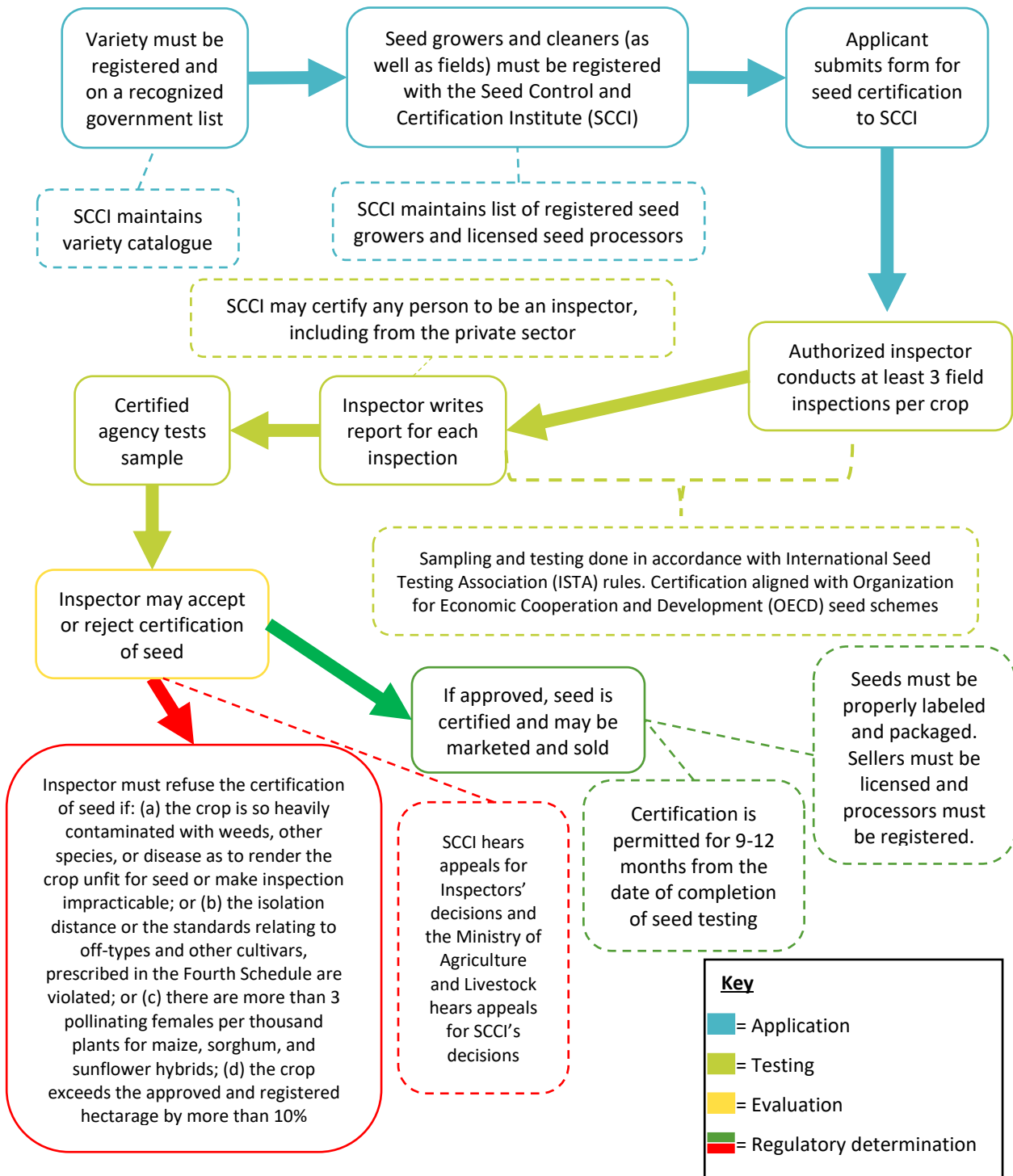
According to the Seeds Regulations (as amended in 2018), all certified seed for sale in Zambia must be a registered variety approved for release, and the seed must have been produced, inspected, sampled, tested, and comply with the minimum standards of the laboratory quality tests as required by the Seeds Regulations.⁴⁶ The Seeds Act and Seeds Regulations constitute the primary measures governing the seed certification process in Zambia, which SCCI implements. SCCI also requires registration of seed growers and cleaners, as well as fields and seed crops;⁴⁷ the registration of fields is a SADC requirement. Figure 2 below depicts the regulatory process for seed certification in Zambia.

⁴⁵ News reports from the end of 2018 report that Zambia has launched a SADC aligned regional seed system. See “Zambia Government Launches the SADC Seed Certification and Harmonized Seed Regulations System,” *AgroNews*, December 7, 2018, <http://news.agropages.com/News/NewsDetail---28628.htm>.

⁴⁶ Articles 6-8 of the Plant Variety and Seeds Regulations (2018). See also Setimela P.S., B. Badu-Apraku, and W. Mwangi. 2009. *Variety testing and release approaches in DTMA project countries in sub-Saharan Africa*. Harare, Zimbabwe, CIMMYT, page 27. <http://libcatalog.cimmyt.org/download/cim/93477.pdf>; Ministry of Agriculture: Key Programmes at SCCI; http://www.agriculture.gov.zm/index.php?option=com_content&view=category&layout=blog&id=98&Itemid=13.

⁴⁷ SCCI. “Steps in Seed Certification Process.” 3 May 2017, Web.

Figure 2: Seed Certification in Zambia



Source: New Markets Lab, 2017

There is an online platform to help SCCI register seed growers, and SCCI maintains a list of all registered entities. SCCI receives applications for certification, and each application may only refer to a single variety produced on the same farm unless otherwise allowed by SCCI. Once SCCI accepts an application, it provides the seed grower with a certificate of registration that specifies the conditions for growing the registered seed crop. Unless SCCI decides otherwise, seed growers may only grow one cultivar of the same species per farm. The registered seed crop must not exceed the approved hectareage by more than 10 percent, or the excess will be destroyed without compensation. After taking a sample, the inspector conducts a minimum of three field inspections for open pollinated crops, and five field inspections for hybrids (three of these inspections must be done while the hybrid plant is flowering).⁴⁸ Public or accredited private sector inspectors may inspect seed crops during production and are subjected to minimum field standards for each class.

SCCI may license any seed company or institution as a certifying agency for the purposes of inspecting, sampling, or testing seed.⁴⁹ To maintain consistency in the process, SCCI audits private testing laboratories.⁵⁰ Private seed inspectors are held to the same minimum qualifications as a government seed inspector.⁵¹ In order to receive accreditation as a private seed inspector in Zambia, the applicant must have a diploma in agriculture and pass SCCI's Seed Inspector Training Course. According to TASAI, Zambia has 118 licensed seed inspectors, including 83 private sector inspectors.⁵² TASAI found that seed companies are generally satisfied with the availability and performance of seed inspectors.⁵³

Companies have reported that having their own seed inspectors saves time and money, as it is difficult for government inspectors to visit the sites required for certification purposes. While it

⁴⁸ Article 12(4) of the Plant Variety and Seeds Regulations (2018).

⁴⁹ Sections 3(2), 17 and 18 of the Plant Variety and Seeds Act, Cap 236, No. 21 of 1995. (PVSA). Section 17 of the PVSA provides that: (1) The Certifying Authority may license any seed company or institution as a certifying agency in any kind of seed and plant variety. (2) The applications for a license referred to in subsection (2) shall be made in such form and under such conditions as may be prescribed by the Certifying Authority. Further, Section 18 of the PVSA provides that: (1) The Certifying Authority may approve any person to be an official seed inspector, sampler or tester for a certifying agency for the purposes of this Act. (2) The application for approval as an official seed inspector, sampler or tester shall be in such form and shall be granted on such conditions as may be prescribed by the Certifying Authority; See also, Article 13 of the Plant Variety and Seeds Regulations (2018).

⁵⁰ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

⁵¹ Article 13(7) of the Plant Variety and Seeds Regulations (2018).

⁵² Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

⁵³ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. http://tasai.org/wp-content/themes/tasai2016/img/tasai_brief_2017_zambia_final_lr.pdf.

is considered a best practice for companies to have their own private seed inspectors, stakeholders noted that the government does the final testing. Ensuring that sufficient inspectors are available for testing, including final testing, is important, especially for smaller seed producing companies that may not yet have their own accredited private inspectors.

Zambia has aligned its seed certification process with the OECD Seed Schemes, as well as requirements under COMESA and SADC.⁵⁴ Article 21(2) of the Seeds Regulations states: “A person may blend and bulk crops from different fields of the same origin, species, and cultivar which have passed field inspections to constitute one seed lot under supervision of an official seed inspector.” SCCI keeps inspection reports, which is a SADC requirement. Although many companies have their own laboratories, the government only has three labs, one of which is ISTA accredited. Stakeholders assert the government labs can be congested and expensive. For companies completely reliant upon the government labs, such as small, local companies, it can take from between 10 to 14 days to up to more than one month to get feedback from the laboratory testing. Seed crops that fail to meet the standards are rejected for seed certification. On the other hand, seed lots that meet the laboratory standards are certified for sale. Zambia permits seven classes of general seed under its certification scheme:⁵⁵

- Pre-basic seed (A)
- Basic seed (B)
- Certified seed, 1st generation (C1)
- Certified seed, 2nd generation (C2)
- Certified seed, 3rd generation (C3)
- Certified Seed 4th generation (D)
- Quality Declared Seed (QDS)

Emergency class seed (E) are also available when there is a “serious shortage of seed.”⁵⁶ Certification is permitted for 2, 9, or 12 months from the date of completion of seed testing, depending upon the type of crop.⁵⁷ As seen in Table 2, below, Zambia’s seed classes largely align with the four seed classes of COMESA and SADC, although Zambia has additional certified generations 3 and 4 (C3 and C4). SADC and Zambia also have the additional class of QDS, unlike COMESA.

⁵⁴ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

⁵⁵ Article 6(3) of the Plant Variety and Seeds Regulations (2018). Note that potato seeds have a different seed certification scheme that uses six classifications (pre-basic, basic, certified seed 1st generation, certified seed 2nd generation, certified seed 3rd generation, and certified seed 4th generation). Fourth Schedule, Plant Variety and Seeds Regulations (2018).

⁵⁶ Fourth Schedule, Plant Variety and Seeds Regulations (2018).

⁵⁷ Article 33, Plant Variety and Seeds Regulations (2018).

Certification of seed for the local market is declared on national certificates, whereas seed quality for seed lots destined for the international market is usually declared on the orange international ISTA certificate (national seed certificates may be used if the importing country does not require an ISTA certificate). Under the new Seeds Regulations, Zambia meets the labeling color requirements of COMESA and SADC. Zambia also uses OECD labels (and follows the OECD color scheme) for internationally traded seed.

Table 2: Comparison of Zambian Seed Classes with SADC and COMESA Seed Classes (and Label Coloring)

Zambia Seed Classes	SADC Seed Classes	COMESA Seed Classes
Pre-Basic Seed (violet stripe on white)	Pre-Basic Seed (violet band on white)	Pre-Basic Seed (violet band on white)
Basic Seed (white)	Basic Seed (white)	Basic Seed (white)
Certified Seed, 1 st Generation (blue stripe on white)	Certified Seed, 1 st Generation (blue)	Certified Seed, 1 st Generation (blue)
Certified Seed, 2 nd Generation (Red stripe on white)	Certified Seed, 2 nd Generation (red)	Certified Seed, 2 nd Generation (red)
Certified Seed, 3 rd Generation (Red stripe on white)		
Certified Seed, 4 th Generation (Green stripe on white)		
Quality Declared Seed (Green)	Quality Declared Seed* (green)	
Emergency Class Seed (Yellow)		

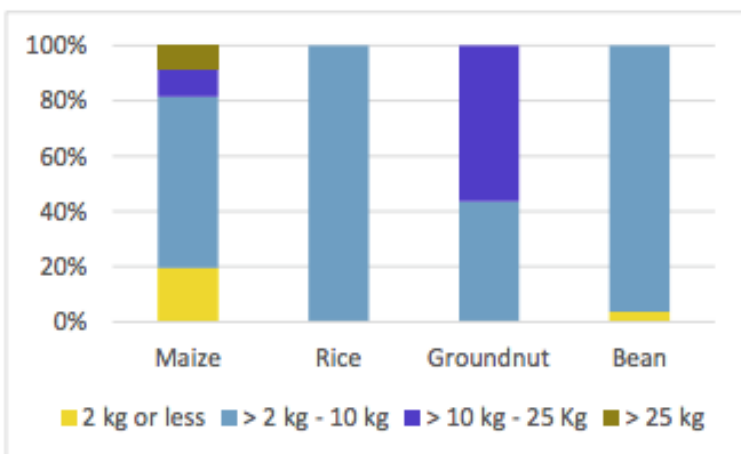
*Source: New Markets Lab, 2018. Information derived from SADC Technical Agreements on Harmonization of Seed Regulations, 2008 and COMESA Seed Trade Harmonization Regulations, 2014. *Quality Declared Seed recognized under SADC does not imply ease of trade across borders of all SADC members.*

Certified seed lots must be properly packaged in bags, sealed and labeled with a certification label, which must include the seed class, the certification number, the species and cultivar of seed, the lot number, its purity (percentage by weight), germination capacity (percentage by number), and the “date of test and warning test where the seed lot is treated.”⁵⁸ Inspectors that seal the certified seed bags must submit a report of the sealing, and any repackaging must be approved by SCCI and done under SCCI’s supervision.⁵⁹ Increasingly, smaller packages of seed are being sold, which is beneficial for smallholder farmers (see Graph 1 below).

⁵⁸ Article 30(1), Plant Variety and Seeds Regulations (2018).

⁵⁹ Article 29(2), Plant Variety and Seeds Regulations (2018).

Graph 1: Percentage of Seed Sold in Different Package Sizes



Source: Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017. The African Seed Index (TASAI)*, September 2017. Web.

Seed crops that fail to meet the standards under seed certification are rejected and cannot be sold on the market. However, if such seed fails to meet all requirements under the certification procedures⁶⁰ but conforms to the standards of germination and purity prescribed for such variety, then it can qualify to be sold as QDS.⁶¹ The QDS requirements are less demanding than those for formal seed certification and are thus often viewed as being less cumbersome for small seed producers and farmers.⁶² The fifth schedule of Zambia’s Seed Regulations state the minimum germination and purity standards that each seed variety must meet under testing before it can be declared as quality seed.⁶³ Figure 3 below depicts the regulatory process for QDS in Zambia.

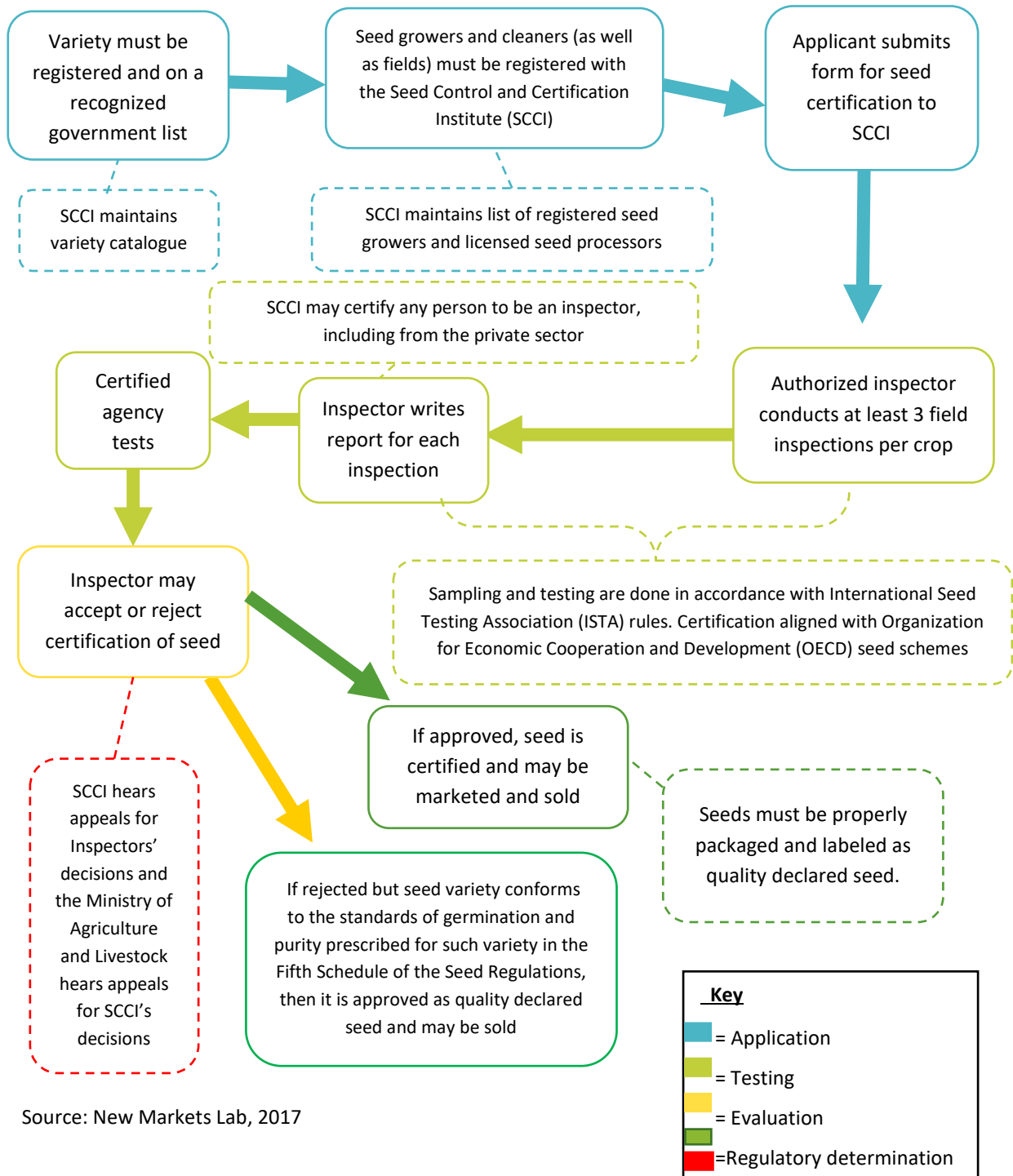
⁶⁰ Other requirements for seed to be certified under section 59(1) of the *Zambian Seed Act*, are that the seed has to “be of a specified variety; and is of known derivation; and has been produced by a registered seed producer; and has been produced on the land designated in the register; and has been sown, cultivated and produced as prescribed; has been inspected during cultivation as prescribed; and has been tested in the manner prescribed and found to conform to the standards of germination and purity prescribed for seed of that specified variety.”

⁶¹ Section 66 of the *Plant Variety and Seeds Act*.

⁶² Katrin Kuhlman, et al, *Seed Policy Harmonization in COMESA and SADC: The Case of Zambia*, New Markets Lab and Syngenta Foundation for Sustainable Agriculture Working Paper.

⁶³ Article 8, *Plant Variety and Seeds Regulations* (2018).

Figure 3: QDS Process in Zambia



Source: New Markets Lab, 2017

Additional licenses are required for seed processors and sellers. Seed processors submit an application and fee to SCCI, which inspects the processing facilities and confirms whether the applicant is able to produce quality seed. If satisfied by the ability and facilities of the applicant, SCCI approves the license, which is valid for 12 months and contains the conditions for processing seed.⁶⁴ SCCI maintains a register of licenses for processing seed and may inspect the premises.⁶⁵ Seed sellers must also submit licensing applications and fees to SCCI. SCCI must issue the license if satisfied the applicant has ability, knowledge, and appropriate facilities to maintain the quality and viability of the seeds for sale.⁶⁶ Licenses must provide conditions for sale of seed and are also valid for 12 months. SCCI maintains registry of seed seller licenses, and it may inspect premises where seeds are sold.

As in many sub-Saharan African countries, counterfeit seed is a significant challenge in Zambia. According to TASAI, 22 cases of fake seed sales were reported in the 2015-2016 season, which is considered an underestimate given that a number of unreported cases exist. Seed companies reported that agrodealers, marketing agents, and informal cross-border imports are the primary conduits for counterfeit seed, calling for the need for training of these market actors.⁶⁷ To address the challenge of fake seed, SCCI is collaborating with private seed companies and other stakeholders to conduct regular seed market inspections, increase awareness (including through farmers' workshops), and enhance security features on seed packages; however, a lack of resources limits these efforts.⁶⁸ SCCI is working to ensure that all seed produced is properly labeled. To support these efforts, SCCI has suggested that ZASTA could be authorized to print seed labels, and companies would get approval to purchase the certified labels. Companies on the approved list would be sent a label, and ZASTA would share the list of purchased labels with SCCI at regular intervals. Companies would pay a small fee to ZASTA to maintain the labeling system. As regional implementation moves forward, COMESA and SADC labels will be available and used as well.

⁶⁴ Article 17(4), Plant Variety and Seeds Regulations (2018).

⁶⁵ Article 17(5)-(7), Plant Variety and Seeds Regulations (2018).

⁶⁶ Article 18(1)-(8), Plant Variety and Seeds Regulations (2018).

⁶⁷ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. Web.

⁶⁸ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. Web.

Cross-border Trade

Due to the well-developed nature of Zambia's seed sector, trade in seed is essential, although imports in particular are subject to increasingly stringent standards. In 2009, about 15,958 tons of seed were exported out of Zambia accompanied by ISTA certificates, and only 3,076 tons were imported into the country on ISTA certificates.⁶⁹ By 2015 the amount of exported seed declared ISTA-certified had increased to approximately 20,000 tons.⁷⁰ In that same year, fewer than 5,000 tons of seed were imported.⁷¹ The import and export of seed in Zambia is governed largely by the Seeds Act and its implementing Seeds Regulations.

Importation of Seed into Zambia

Zambia's regulations require that seed importers must have a valid seed seller's license and import permit for seeds. Of note, there are three categories of seed seller licenses: retail, wholesale, and retail & wholesale.⁷² Applicants wishing to import seed first must submit a Notice to Import Seed form to SCCI. The SCCI then checks on the seed stock levels of such crop in the country to determine the merits of the request. When the SCCI approves the notice, it implies that the seed can be imported, provided the importer complies with all other Zambian laws.

The Plant Pests and Disease Act provides for the establishment of control measures for crop specific pests and disease-causing pathogens that should be avoided when plant or plant product are imported into Zambia. Applicants seeking to import seed must submit the approved Notice to Import Seed form to ZARI to receive a phytosanitary requirement note. Next, the Phytosanitary Requirement Note and approved Notice to Import Seed form must be submitted to the Trade and Entrepreneurship Unit in the Department of Marketing under the Ministry of Agriculture and Livestock, which provides the Import Permit.⁷³ The applicant then must send the three documents – Notice to Import Seed, phytosanitary requirement note, and Import Permit – to the exporting country. Prior to importation into Zambia, the competent authority in the exporting country must declare that the phytosanitary conditions have been met.

⁶⁹ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

⁷⁰ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. Web.

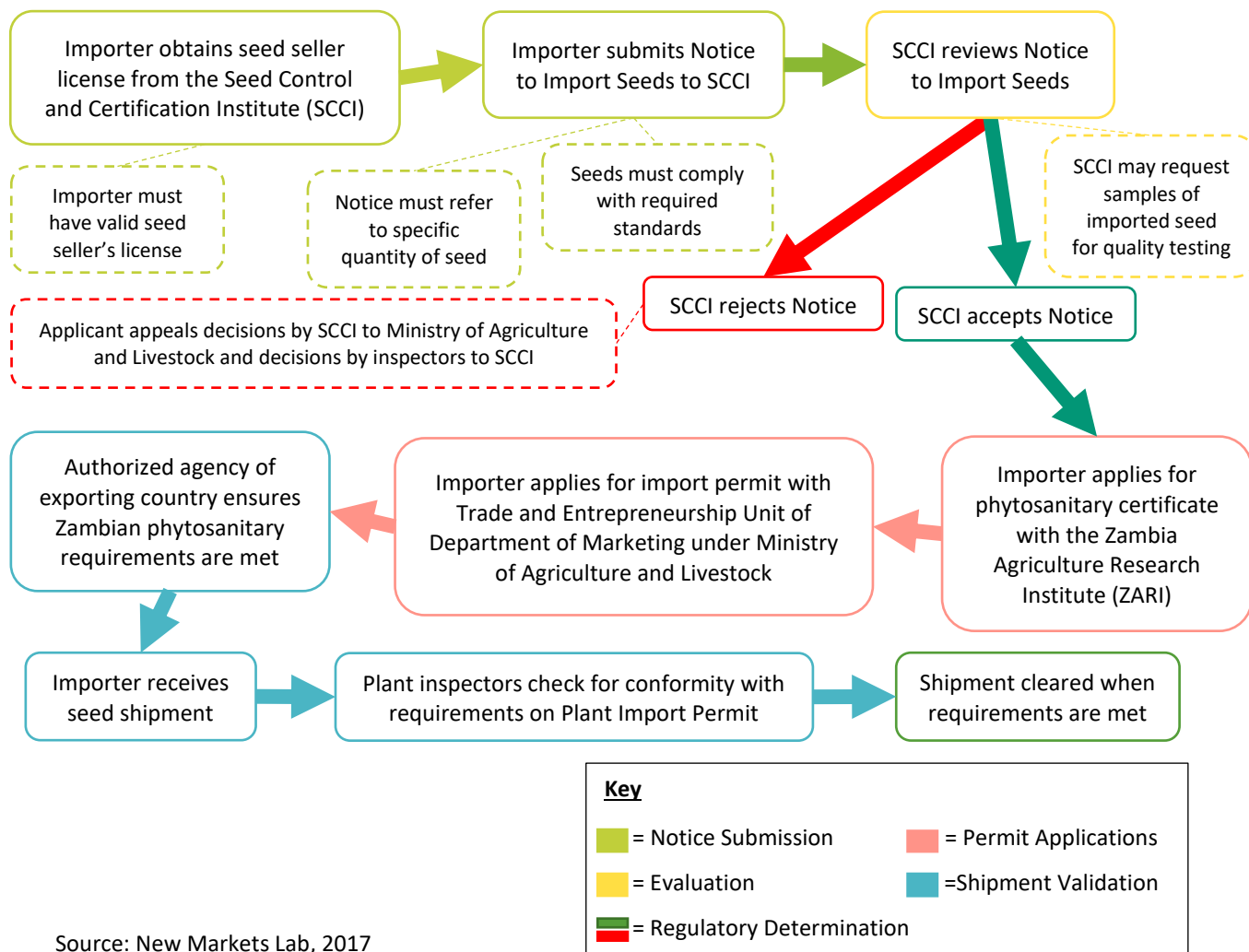
⁷¹ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. Web.

⁷² SCCI. "Steps in Seed Certification Process," 3 May 2017, Web.

⁷³ SCCI. "Steps in Seed Certification Process," 3 May 2017, Web.

Upon the arrival of imported seeds in Zambia, plant health inspectors check for conformity with the requirements that were specified on the Import Permit. Imported seeds must meet minimum standards, and samples for registered seed may be drawn for testing by SCCI, while a sample of prescribed seed imports must be tested.⁷⁴ The imported goods are cleared when the requirements are found to have been met.

Figure 4: Importation of Seed Into Zambia



Source: New Markets Lab, 2017

⁷⁴Article 44(1) of the Plant Variety and Seeds Act.

The total time to import seed is reported to range from 2 to 21 days, with an average of 11 days.⁷⁵ There is discussion within Zambia on how to streamline and simplify the importation process, and one suggestion has been to draw a single form from the Notice to Import Seed and the Plant Import Permit, which would then be issued as a single document from one office.⁷⁶ The current process for importing is described in Figure 4 above.

Exportation of Seed from Zambia

Companies exporting seed from Zambia generally obtain an ISTA seed analysis certificate from SCCI, which declares the quality level of the seed lot. For some importing countries that do not specify the need for an ISTA certificate, SCCI provides national seed certificates. The applicant then must obtain a phytosanitary certificate from ZARI that declares that the seed lot is free of pests and diseases specified under the import permit requirements of a respective country. Notably, plant health inspectors in Zambia participate in the seed production certification process, which then allows ZARI to declare that a seed crop was produced free of certain pests and diseases.⁷⁷ If no issues arise with the steps above, the Ministry of Agriculture and Livestock's Department of Marketing issues the Export Permit. According to the Seeds Act, the Minister of Agriculture and Livestock has authority to restrict or limit exports.⁷⁸ Zambia occasionally sets export bans to protect local markets and food reserves in anticipation of a shortage of commercial seed. Stakeholders find that such bans distort the market, and those enforcing the ban often cannot identify whether exports are seed or foodstuff. For example, Zambia's export ban on maize caused challenges for trade in seed, since a number of border officials reportedly could not differentiate between maize seed and commercial maize. Figure 5 below illustrates the regulatory process for exporting seed from Zambia.

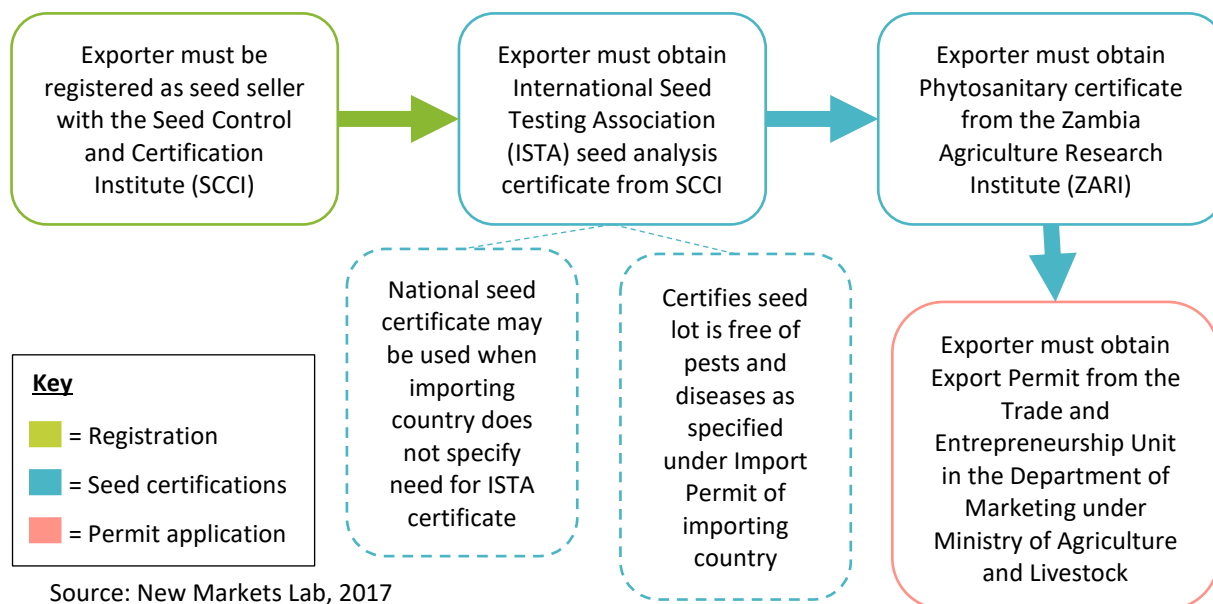
⁷⁵ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. Web.

⁷⁶ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

⁷⁷ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

⁷⁸ Article 47(1) of the Plant Variety and Seeds Act.

Figure 5: Exportation of Seed From Zambia



TASAI reported that companies find the export process slightly better than the import process, although the ease of exporting will largely rest upon the destination country. Major challenges described by stakeholders included lack of transparency on the import and export certification processes, a short validity period for the phytosanitary certificate, and challenges around differentiating between maize seed versus grain during times when export bans are in place.⁷⁹

Regional Harmonization

Opportunities for farmers and food security are enhanced significantly by the openness of regional markets.⁸⁰ However, while access to broader markets presents the possibility of better prices and business expansion, complex regulatory systems can present challenges.⁸¹ Alignment of seed laws and regulations with regional and international best practices is a significant factor in promoting a modern and competitive seed industry.⁸² A common regulatory framework can reduce the cost of trading seed and germplasm as well as encourage economies of scale in seed

⁷⁹ Edward Mabaya, Francisco Miti, Watson Mwale, and Mainza Mugoya. *Zambia Brief 2017*. The African Seed Index (TASAI), September 2017. Web.

⁸⁰ Paul Brenton, et al. *Africa can Help Feed Africa: Removing Barriers to Regional Trade in Food Staples*. World Bank Group, 2012. Web.

⁸¹ Katrin Kuhlmann and Cheikh Sourang. *The Role of Law and Regulation in Scaling Up African Value Chains*. International Fund for Agricultural Development, Working Draft, 2015.

⁸² David Gisselquist. *Harmonization of Seed Legislation and Regulation in CEED, CIS, and Other Countries in Transition*. FAO, Corporate Document Depository. 2001. Web.

production, including commercial seed. Expanded commercial seed production, in turn, provides farmers with better access to new and improved seed varieties and stimulates productivity and growth.⁸³

Although several significant regional economic communities (RECs) across sub-Saharan Africa, including SADC and COMESA, have established regional seed frameworks, effective implementation of these frameworks will require further action at the national level as well as mutual recognition of rules and regulatory systems between countries.⁸⁴ For most RECs, including COMESA and SADC, regional rules must be incorporated into national law in order for regional initiatives to be effective. Understanding national seed systems within the context of regional harmonization will provide insight into how implementation of regional rules can work in practice, as well as gauge future market potential. (See Annex I for a comparison of relevant regional harmonization efforts).

Notably, both the COMESA Headquarters and SADC Seed Centre are based in Lusaka, which presents enhanced opportunity to assess regional frameworks and their implementation in Zambia. It also signals the possibility of Zambia increasingly acting as a regional hub. The COMESA seed system is governed by the COMESA Seed Trade Harmonization Regulations, 2014 (COMESA Seed Regulations), while the SADC seed system is governed by the SADC Harmonized Seed Regulatory System (SADC HSRS). Under the COMESA institutional structure, regional regulations, like the COMESA Seed Regulations, are binding on member states, but they still require domestication at the national level to give effect to implementation. The SADC HSRS is the result of a regional memorandum of understanding (MoU), which is a non-binding legal instrument under the SADC institutional structure, which member states can formalize by domestication through their own legal and regulatory processes. The SADC Seed Centre was created to support implementation, and SADC has developed procedure manuals to help stakeholders understand how to navigate regional SADC rules on variety release and registration, accreditation and certification, and trade.⁸⁵ However, many stakeholders reported that the SADC Seed Centre is underfunded and does not have adequate staff or resources. A review of the SADC Seed Centre is currently underway, and institutional changes are forthcoming.

⁸³ David Rohrbach. *Looking Beyond National Boundaries: Regional Harmonization of Seed Policies, Laws, and Regulations*. World Bank Group, 2003. Web.

⁸⁴ Katrin Kuhlmann. *Harmonizing Regional Seed Regulations in Sub-Saharan Africa: A Comparative Assessment*. Written for the Syngenta Foundation for Sustainable Agriculture, 2015.

⁸⁵ "SADC Seed Centre Documentation – Background Documents," SADC Library on SADC Seed Centre website. Accessed 19 Nov 2017. <http://sadcseedcentre.com/library/sadc-seed-centre-documentation-background-information>.

As noted, regional harmonization could enhance competitiveness by reducing costs and opening new markets. As companies become more familiar with the regional seed systems, the level of implementation at the national level may become an increasingly important factor in where they do business and which national markets become competitive within the region. Both COMESA and SADC have established regional seed offices that are intended to help companies and have designated national seed authorities (NSAs) to implement the regional harmonization schemes. On paper, the COMESA Seed Regulations and SADC HSRS are quite similar. For example, both require member countries to designate an NSA, which is SCCI in Zambia's case. COMESA and SADC each also require testing in ISTA-accredited labs and conformity with the OECD Seed Schemes and UPOV.

COMESA considers Zambia to be fully aligned with the regional seed regulations, and news reports from December 2018 indicate that Zambia is also compliant the SADC HSRS requirements.⁸⁶ While not yet a member of OECD or UPOV, Zambia has worked to align its national requirements with their standards. However, the process of aligning Zambia's critical variety release, certification, and trade processes with SADC remains underway. The recent reforms to the Seed Regulations addressed some of the remaining gaps, but the import and export procedures may continue to present challenges to full implementation.

Regional Variety Release and Registration

Regional variety catalogues have been established and are in use in both COMESA and SADC. Under both systems, a variety listed in the regional variety catalogue should be able to be marketed freely in any country in the region. Both the SADC and COMESA systems have a similar exception to the marketing rule whereby a member state has the discretion to ban a variety due to unsuitability or risk, and stakeholders have reported that additional challenges with marketing varieties that appear in the regional catalogues have arisen.

Despite the similarities between COMESA and SADC, some differences also exist. COMESA has established a fast track option for national variety release, similar to the agreement under the Association for Strengthening Agricultural Research in Eastern and Central Africa and the Eastern and Central Africa Programme for Agricultural Policy (ASARECA/ECAPAPA Agreement) in place among Burundi, Kenya, Rwanda, Tanzania, and Uganda (of which all but Tanzania are also COMESA members). To fast-track release under the COMESA Seed Regulations, a variety that has been released in one member state need only undergo one season of testing in order

⁸⁶ "Zambia Government Launches the SADC Seed Certification and Harmonized Seed Regulations System," *AgroNews*, December 7, 2018, <http://news.agropages.com/News/NewsDetail---28628.htm>.

to be released in a second member state. Because most COMESA member countries, including Zambia, require at least two seasons of testing before a new variety can be approved for release, this option could significantly fast track release for companies. This is especially true for crops with longer growing periods.

Notably, the SADC HSRS specifically provides for inclusion of landraces and other local varieties in the regional catalogue.⁸⁷ The COMESA Seed Regulations are silent as to their inclusion, but it can be assumed that they would be eligible if they were released in at least two COMESA member countries and meet all applicable requirements.

Regional Certification

Throughout COMESA and SADC, centralized certification of seed is commonly required, with the exception of South Africa. The COMESA Seed Regulations and SADC HSRS both establish harmonized certification standards based on international best practices. For example, the COMESA Seed Regulations and SADC HSRS set forth specific seed classes and harmonized labeling schemes based on ISTA standards. As noted above, COMESA and SADC have similar seed classes, although SADC also allows for QDS. Both COMESA and SADC align with international standards like the OECD Seed Schemes. Under COMESA and SADC, the NSA has authority over inspections, sampling, and accrediting or registering laboratories. Both SADC and COMESA have their own uniform labeling requirements, and COMESA has launched its own label and certificates or seals that NSAs can provide to companies that produce seed according to their regional requirements. According to interviews, SADC is currently focused on implementation of regional certification, labeling, and quality standards. Although the SADC HSRS has a standard form for what to include on the label and what color the label should be, no actual SADC label exists. Instead, SADC provides a letter stating that the variety is listed in the regional catalogue. Stakeholders have highlighted that this interim process presents a challenge to regional trade. SADC also allows for certification of any seed crop, yet sampling standards exist only for select crops.

Zambia is considered to be aligned with COMESA and largely aligned with SADC. Zambia does have additional seed classes and allows for 3rd and 4th generation certified seed as well as QDS and emergency seed. The 2018 Seed Regulations also aligned Zambia's seed label color schemes with both COMESA and SADC (some small differences remain, but Zambia's current scheme appears to align with the regional rules). SCCI has been enforcing SADC standards for

⁸⁷ § 2.3.7 Technical Agreements on the Harmonization of Seed Regulations in the SADC Region. Southern African Development Community (SADC).

companies wishing to receive SADC certification, even though Zambia's regulations have not been updated to align with SADC requirements.⁸⁸ Especially because Zambia is ISTA accredited and aligned with OECD standards, Zambia's current standards are largely similar to SADC and COMESA. Yet, differences exist, and a careful review should be done to ensure complete conformity.⁸⁹ Finally, Zambia lacks provisions that afford equal status to varieties listed in the SADC or COMESA Seed Catalogues and seed certified under the regional systems.

The use of private sector inspectors or laboratories is not prohibited under either regional system, but accreditation requirements vary. Under COMESA, the NSA may accredit laboratories, seed samplers and analysts, and inspectors. The Council of Ministers of the Common Market may set rules for such accreditation under COMESA, which have not yet been agreed upon. Under SADC, accredited inspectors or other personnel must pass an authorized seed technology class and complete at least one season of practical training by an authorized SADC system seed specialist. The NSA must also issue a certificate or identity card to accredited personnel. While Zambia already requires private seed inspectors to pass the SCCI seed inspection training, it is unclear whether this training fulfills SADC requirements or whether the SCCI-issued license meets the requirement for a SADC certificate or identity card. If so, Zambia arguably sets a higher bar for becoming an authorized seed inspector, as it also requires accredited personnel to hold a degree in agriculture. As COMESA identifies specific rules, Zambia must consider whether additional changes will be needed for alignment.

Regional Cross-Border Trade

Cross-border trade measures typically include import and export permit requirements and application of sanitary and phytosanitary (SPS) measures such as phytosanitary certificates. SPS measures pertaining to pests and diseases that can harm otherwise healthy crops can be particularly important, but these measures should be science-based and non-discriminatory to prevent unnecessarily restricting seed trade. Zambia is a signatory to the WTO Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) and a contracting party to the International Plant Protection Convention (IPCC). As a contracting party to the IPCC, Zambia has also adopted the International Standards of Phytosanitary Measures. SADC and COMESA have both moved to harmonize quarantine and phytosanitary measures to facilitate fast and safe movement of seeds across borders. Table 4 (below) compares the key trade documents under the two regional seed systems.

⁸⁸ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

⁸⁹ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

SADC and COMESA have established pest lists, and COMESA is considering updates to the regional quarantine pest list for maize seed given the outbreak of the Fall Army Worm in the region.⁹⁰ SADC has two pest lists, one for movement among SADC member states and one for movement from within SADC to a country outside the region (or vice versa). Notably, both the COMESA Seed Regulations and SADC HSRS have provisions for equivalency, urging members to recognize alternative pest managements systems of other member states to promote regional trade. Zambia has not yet adopted SADC’s or COMESA’s pest lists, and some differences exist between Zambia’s list and the SADC list.⁹¹ Both the COMESA and SADC pest lists need to be integrated into Zambia’s national laws and regulations.

Table 4: Comparison of Key Trade Documentation in COMESA and SADC

Document Type	COMESA Seed Regulations	SADC HSRS
Plant Import Permit	X	X
Phytosanitary Certificate	X	X
Non-compliance Notification (may be issued by an importing country on shipments carrying seed that does not conform to the conditions on the plant import permit)	X	X
Re-export Phytosanitary Certificate (may be issued where seed shipment is in transit)	X	X
Seed Testing Certificate	X	

Source: New Markets Lab 2017. Compiled from COMESA Seed Trade Harmonization Regulations and SADC Harmonized Seed Regulatory System.

COMESA and SADC require member countries to use the same types of documents, apart from the Seed Testing Certificate under the COMESA Seed Regulations, but the form for each REC is visually different. Zambia’s 2018 Seed Regulations appear to have formally incorporated the regional document forms for COMESA into its existing laws and regulations. A draft Zambian manual was developed to guide all stakeholders – applicants, SCCI, ZARI, and the Department of Marketing of the Ministry of Agriculture and Livestock – on how to import and export seed in the SADC region, which will help facilitate alignment with SADC.⁹² This draft should be finalized and widely distributed to facilitate implementation.

⁹⁰ “Pest Risk Analysis Expert,” COMESA website, Aug 9, 2017, available at <http://www.comesa.int/pest-risk-analysis-expert/>

⁹¹ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

⁹² Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

Neither COMESA nor SADC provide a harmonized system for regional plant breeders' rights (PBRs), however, SADC does have a PBR advisory committee and previously proposed a draft protocol for the protection of new plant varieties. Notably, as regional harmonization efforts continue, questions around exclusive marketing rights could arise for varieties developed with international breeding material that is shared under material transfer agreements. As regional markets develop further, companies may seek regional marketing rights, which could lead to a new set of regional implementation challenges. One stakeholder interviewed also suggested that issues could arise with the intellectual property rights for international varieties. Zambia has a Plant Breeders' Rights Act based on the proposed draft SADC protocol, but Zambia has not yet enacted implementing regulations.⁹³

At the international level, Zambia is a party to a number of key agreements protecting PBR. As noted, Zambia is aligned with UPOV but is not yet a UPOV member. Zambia is also a signatory to the WTO Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) and holds membership with the African Regional Intellectual Property Organization (ARIPO), which adopted the Arusha Protocol for the Protection of New Varieties of Plants on July 6, 2015. In addition, Zambia is a signatory to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (CBD). The CBD is an international treaty that governs the movement of living modified organisms resulting from modern biotechnology from one country to another. Zambia has also signed the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). This Treaty provides a legal framework recognizing the need for conservation and sustainable use of plant genetic resources for food and agriculture and a regime for access and benefit sharing.

Industry Experience

In development of this case study, the authors conducted consultations with seed companies in Zambia in order to understand their perspectives with respect to variety registration, seed certification, and cross-border trade. Their experiences are summarized below.

Company A stated that the variety registration process for maize in Zambia was straightforward and quite smooth. It requires three seasons of VCU tests and a minimum of two seasons of DUS tests. The VRC typically meets twice a year to evaluate new varieties. Company A noted private seed inspection is allowed in Zambia. SCCI carries out capacity building in the seed sector, including training and examining seed inspectors from both the public and private sectors. Successful applicants are licensed to perform seed quality control activities. The company

⁹³ Dr. Francisco Miti. *Baseline Study/Survey on the Seed Sector of Zambia*. The African Seed Trade Association, 3 May 2017. Web.

currently has four to five in-house inspectors and recently established its own seed testing lab, which has yet to apply for ISTA accreditation. The company anticipates that the lab will improve seed testing efficiencies. Although the government has several working labs (the SCCI's main seed testing lab in Chilanga is ISTA-accredited), there is often a backlog in the government labs due to limited capacity, and it can take more than three weeks to get the seed samples tested.

Company B registered several maize and soybean varieties in Zambia and acknowledged that the registration process has been smooth. It took on average two years to get varieties tested and registered. The company has three seed inspectors in house, about one inspector per agro-ecological region. It also works with three government inspectors for seed certification. The company has recently entered several varieties into the SADC regional variety catalogue.

Company C produces mainly hybrid maize seeds. The variety registration and seed certification processes with SCCI have been straightforward and without complication. However, the maize ban took a toll on the company's seed export business, as customs officers did not adequately differentiate between maize grain and seeds.

The company has its own accredited lab. It uses SCCI's ISTA lab to issue ISTA seed analysis certificates for exporting to countries that require them (e.g. South Africa). If a seed company produces seed varieties that are only for export purposes, there is a different process for registering such varieties.

According to the company's experience, regional harmonization is not working well in practice due to differences in countries' domestic legal systems. For example, Malawi had asked the company to change labels for 40,000 tons of maize seeds at the border. The fact that Malawi had not yet aligned its seed-related legislation and regulations with COMESA hampered the harmonization process. Regarding SADC, Tanzania requested OECD labels at border control, which resulted in significant additional spending to obtain new labels.

Company D is an indigenous seed company, working with many small-scale farmers. Until 2004 it worked mainly on food production for the public sector. In 2004, it started to work on QDS. However, due to recent increased application of OECD Seed Schemes, Company D worries Zambia may now be in the process of phasing out QDS (at least in practice), which is incompatible with OECD rules and the SADC HSRS. This demonstrates the need for increased understanding of regional and international rules.

For cowpea and groundnut, the company has problems getting sufficient early-generation seeds, because the government has limited capacity to produce those. In the company's view,

public-private partnerships in early generation variety production are very much needed. As noted above, TASAI also found that groundnut was a crop with some of the oldest varieties still in existence on the market. For certain crops (e.g. Irish potato, legume, millet, sorghum), the system offers some flexibility. While trialing, the company can sell some of the seeds to test the market. For a company that would like to enter into such crops like legumes, they can write to SCCI to apply for the special practice.

Recommendations

With regulatory reforms recently completed, Zambia is at a turning point in the development of its national seed system and alignment with regional seed regulatory systems. How this system develops over the next few years will determine whether Zambia is able to more fully take advantage of the opportunities that the larger regional markets of COMESA and SADC present. The decision points and recommendations outlined below could play a role in enhancing Zambia's seed system, implementing the COMESA and SADC regional frameworks, and possibly bringing dynamic change to the seed sector.

National

- ***Align National System with Regional Protocols.*** This is a good regulatory practice to facilitate harmonization with regional seed frameworks and a necessary first step towards alignment with regional rules. Zambia recently made significant strides towards aligning its regulatory system with regional rules through the 2018 Seeds Regulations. Among other things, the amended Seeds Regulations recognize regionally released varieties, which should help facilitate regional seed trade. News reports from December 2018 noted that Zambia had launched a SADC-aligned harmonized seed regulation system, although stakeholders consulted in the development of this case study still noted some areas that remain to be addressed. It is also notable that Zambia's current regulatory modernization and reform process has been done through consultation with a wide range of local stakeholders, and the success of the public-private dialogue will hinge upon how well the public sector is able to balance concerns, including those of the most economically vulnerable market participants.
- ***Implement National Laws and Regulations to Align with COMESA and SADC Seed Systems.*** Incorporating regional frameworks into national laws and regulations is only the first step towards alignment with regional obligations. Full implementation will require working closely with stakeholders along the entire seed value chain to ensure that the system works well in practice and participants in the seed industry are able to

take advantage of opportunities in domestic markets as well as regional and international markets. The industry experience documented through this Case Study indicates that implementation challenges still exist.

- ***Streamline and Increase Transparency Around National Regulatory Processes for Seed.*** While Zambia's regulatory process for variety registration and release is well regarded, a number of stakeholders noted that improvements are needed around seed import and export procedures. This would include ensuring that importation procedures are accessible and clear, particularly when other border measures (such as import and export bans) affect trade. Streamlining procedures could also include combining the Notice to Import Seed, import permit, and phytosanitary requirement note into one form approved by one agency.
- ***Apply Good Practices to Improve Quality and Build Capacity Within the Seed Sector.*** Good practices from within sub-Saharan Africa should be spread more widely, and other countries are already looking to Zambia's experiences (for example the accreditation of private seed inspectors) as they reform their own seed regulatory systems. Zambia is also one of the few countries with an ISTA laboratory, and broadening ISTA alignment will help facilitate regional trade. For Zambia, improving upon its own practices, such as increasing the number of available seed inspectors and improving capacity of public laboratories, would help strengthen the good practices already in place. In addition, Zambia could look to other countries' practices, particularly with respect to trade. QDS is also often looked upon as a good practice that can help extend the benefits of seed certification and quality control to more rural areas, and Zambia should maintain this practice, which is permitted as part of an OECD-aligned seed system.
- ***Improve Enforcement of Counterfeit Seed.*** Although Zambia has a relatively well-developed regulatory system for seed, both public and private sectors recognize that counterfeit seed remains a problem and hampers effective cross-border seed trade. Several specific steps have been identified to address the issue of fake seed, such as increasing the role of ZASTA in issuing labels to seed companies. This could potentially be done through regulatory change or issuance of guidelines or procedures for labeling, which would not require legislative change.⁹⁴ Increasing the number of trained, licensed agrodealers could also increase the farmer-to-agrodealer ratio so it is more on par with

⁹⁴ Note, ¶184 of the Plant Variety and Seeds Act states: *The Minister may, by statutory instrument, make regulations for the better carrying out of this Act and, without prejudice to the generality of the foregoing, such regulations make provisions for - ... (xiii) the manner and methods of labelling, stamping, marking or sealing of containers in which any prescribed seed is sold... [including certified seed].*

the region and reduce the distance a farmer must travel to purchase certified seed. Increasing awareness through agrodealer training and farmers workshops as suggested by TASA will be essential and could be done in partnership with ZASTA or other private sector companies to alleviate the resource burden on SCCI. Finally, Zambia could work with stakeholders and partners to identify successful approaches that other countries have used to reduce the incidence of counterfeit seed, such the scratch off seed labels in Kenya, and models for financing them.

Regional

- ***Increase Regional Regulatory Collaboration and Mutual Recognition*** to enhance cooperation among regulators and improve mutual recognition of countries' procedures and results. A significant challenge to effective regional harmonization is the degree to which regulators within a region are willing to work together and recognize each other's procedures and results. As Zambia is now aligned with the COMESA Seed Regulations and increasingly with the SADC HSRS, this will become a bigger challenge, and regulatory collaboration may become a significant sticking point in effectively implementing regional harmonization.
- ***Facilitate Cross-Border Trade in Seed, Germplasm, and Test Data.*** Regional efforts cannot progress unless countries recognize each other's test results and more freely trade in both seed and germplasm necessary for crop breeding. Both the SADC and COMESA procedures are reliant on recognition of test results and data from institutions other than a country's own, yet the test cases conducted by the authors highlight implementation challenges due to differences in countries' regulatory systems. From the industry perspective, cross-border trade is a significant challenge in practice, and some varieties are not yet traded even though they appear in the regional variety catalogues. Border inspectors should be trained to identify seed and understand implications for trade arising from seed harmonization regulations and application of regional SPS rules. Import and export requirements could also be built into trade facilitation efforts, for example. In addition, SADC could consider developing an official SADC label, similar to what has been done in COMESA, to facilitate regional seed trade. Further, trade in germplasm is needed for improvements in crop breeding, and countries should facilitate trade in genetic material as well as commercial seed.
- ***Improve Knowledge of National and Regional Rules Related to Seed*** and enhance the ability of diverse stakeholders to benefit from the formal seed system. While many stakeholders interviewed noted the importance of regional harmonization, few were

aware of the details of the COMESA or SADC seed rules. The knowledge gap was particularly pronounced with respect to the newer COMESA Seed Regulations (although COMESA builds upon the SADC HSRS in a number of respects). Raising awareness of regional frameworks can be done in a number of ways, and ZASTA will have a central role to play as an in-country platform. For example, legal guides could be used to share regulatory requirements and approaches for implement them in practice; other regulatory tools such as the test cases currently being conducted by NML and SFSA could also be instructive. The authors also recommend issuing guidance on regional rules, similar to the newly published Procedures published by SADC on the SADC Seed Centre website. COMESA should consider developing similar procedures for Accreditation and Certification, as well as seed import and export.

Conclusion

This Case Study highlights the progress Zambia has made in developing an effective national-level seed system that can support seed sector development and regional harmonization efforts for seed under COMESA and SADC. Making specific reference to regional frameworks in its laws and regulations will be a critical early step towards alignment with COMESA and SADC, but a strong focus on implementation in practice will be key to successful harmonization with regional seed systems. Given the diverse membership of both COMESA and SADC and Zambia's seed industry experience, Zambia could play a leadership role in sharing good regulatory practices and experiences and might be on its way to becoming a regional hub.

Going forward, additional analysis of how regional harmonization is being carried out at the country level should be done and updated on an ongoing basis, and tools for measuring and sharing information and progress in some of the areas noted above will be critical. All the recommendations outlined above could evolve into concrete initiatives, best practices, and regulatory guidance, and all will require a greater degree of private sector input to become operational (approaches should be tied to market demand and will vary to some degree with the particular crops and circumstances involved). Innovative models for advancing implementation of laws, regulations, and regional protocols can be taken from work in other countries and regions, such as corridors approaches, platforms focused on a particular seed sector or crop, and legal tools. The Case Studies in this series are intended to contribute to a comparative assessment as well, with best practices, successes, and challenges shared within and across regions.

ANNEX 1: Comparison of COMESA and SADC Harmonization on Variety Release and Registration, Certification, and SPS

Comparison of COMESA and SADC Harmonization on Variety Release and Registration		
<p>COMESA</p> <p>COMESA member states are bound by its regulations, but countries must domesticate the agreements through national legal instruments and mechanisms before they can take full effect.</p> <p>Variety release and registration are covered in the COMESA Seed Trade Harmonization Regulations 2014 (Chapter 4).</p>	<p>Regional Status</p> <ul style="list-style-type: none"> • COMESA Regulations shorten variety release to two seasons of DUS and VCU/NPT tests, and members are required to follow UPOV guidelines. • Regional seed catalogue established. Application for entry of a new variety to the regional catalogue may be submitted to COMESA Seed Office after it has been registered in two member countries. Application accompanied with necessary DUS and VCU data. • Process also streamlined if variety registered in one COMESA country –can register in a second following one season of NPT if DUS and VCU data from first country submitted. • Member States can ban a variety for technical reasons, including unsuitability for cultivation or risk to other seed varieties, human or animal health, or the environment; other issues have arisen in implementation. • GM varieties may only be released at the national level and in compliance with national bio-safety regulations. 	<p>National Implementation</p> <ul style="list-style-type: none"> • Zambia’s amended Seeds Regulations align with and will reinforce the COMESA Seed Regulations. COMSHIP/COMESA considers Zambia’s law fully harmonized and Zambia’s Seed Regulations recognize varieties released in regional and international catalogues. • Zambia aligns its inspection and testing for DUS and VCU data with international standards, but is not yet a member of UPOV (or OECD related to seed certification). • Zambia is a member of ISTA, is aligned with ISTA standards, and has an ISTA accredited lab.
<p>SADC</p> <p>Most SADC instruments are not legally binding (with the exception of protocols which are legally binding and must be domesticated through national law). Among the non-binding measures are Memoranda of Understanding (MoUs), such as the MoU to implement the SADC Harmonized Seed Regulatory System (HSRS) signed in June 2013 by 10 of SADC’s 15 members (Angola, Madagascar,</p>	<p>Regional Status</p> <ul style="list-style-type: none"> • The SADC HSRS provides rules on testing and variety release and establishes a regional seed catalogue, although this does not override national seed laws. • The SADC Variety Catalogue and the SADC Variety Database list varieties approved for marketing throughout SADC. • Once a variety is released and registered in two member states, it qualifies, (upon application) for entry into the regional seed catalogue and can be accessed in the rest of the SADC market without further testing. • An exception exists, however, and a country may reject the approved variety if the agro-ecological conditions are deemed unsuitable; other issues have arisen in implementation. 	<p>National Implementation</p> <ul style="list-style-type: none"> • Zambia’s Seeds Regulations partially align Zambia’s system with the SADC HSRS, and Zambia’s Seed Regulations do recognize varieties released in regional and international catalogues. • Zambia aligns its inspection and testing for DUS and VCU data with international standards but is not yet a member of UPOV (or OECD related to seed certification).

<p>Mauritius, Seychelles, and Zimbabwe have not yet signed).</p> <p>Countries may choose to domesticate the regional principles contained in an MoU.</p>	<ul style="list-style-type: none"> • GM seeds will only be added to the SADC catalogue upon the consensus of all members. GM seeds may be released at the national level pursuant to national laws. • The SADC Seed Centre has published a Procedure Manual for Variety Registration for the SADC Region to facilitate implementation. 	<ul style="list-style-type: none"> • Zambia is a member of ISTA, is aligned with ISTA standards, and has an ISTA accredited lab.
Comparison of COMESA and SADC Harmonization on Certification		
<p>COMESA</p> <p>COMESA member states are bound by its regulations, but countries must domesticate the agreements through national legal instruments and mechanisms before they can take full effect.</p> <p>Certification is covered in the COMESA Seed Trade Harmonization Regulations 2014 (Chapter 3), which require members to adopt common Seed Certification Rules.</p>	<p>Regional Status</p> <ul style="list-style-type: none"> • Harmonized labeling based on ISTA standards. • COMESA Seed Classes (four total): (1) pre-basic seed (violet band on white); (2) basic seed (labeled white); (3) first generation certified seed (labeled blue); and (4) second generation certified seed (labeled red). 	<p>National Implementation</p> <ul style="list-style-type: none"> • Zambia’s Seed Classes are aligned with COMESA Seed Classes, but slight differences in the labels exist. Zambia also has additional Seed Classes beyond what is specified under COMESA, namely 3rd and 4th generations of certified seed, Quality Declared Seed (QDS), and emergency seed. • Zambia’s labels are considered aligned with COMESA
<p>SADC</p> <p>Most SADC instruments are not legally binding (with the exception of protocols which are legally binding and must be domesticated through national law). Among the non-binding measures are MoUs, such as the MoU to implement the SADC HSRS.</p> <p>Countries may choose to domesticate the regional principles contained in an MoU.</p>	<p>Regional Status</p> <ul style="list-style-type: none"> • SADC Seed Certification and Quality Assurance System ensures quality of seeds listed in the SADC Variety Catalogue. Testing procedures are based on ISTA rules. The SADC Seed Committee provides technical support for the system’s implementation and development. Seeds that are not listed in the Variety Catalogue can still be traded among member states. • Harmonized labeling to be established based on ISTA standards and appropriate laboratory analysis. • The SADC Project Management Unit (PMU), with technical support from the SADC Seed Committee (SSC) and national agencies governing seeds, will coordinate the SADC Seed Certification and Quality Assurance System. • SADC Seed Classes are: Pre-basic Seed (labeled violet band on white), Basic Seed (labeled white), 1st Generation Certified Seed (labeled blue), 2nd Generation Certified Seed (labeled red), and Quality Declared Seed (labeled green). 	<p>National Implementation</p> <ul style="list-style-type: none"> • Zambia is a member of ISTA and has an accredited ISTA lab. • Zambia is not yet a member of OECD, but its system is aligned with the OECD Seed Schemes. • Zambia’s Seed Classes are aligned with SADC Seed Classes, but slight differences in the labels exist. Zambia also has additional Seed Classes beyond what is specified under SADC (3rd and 4th generations of certified seed and emergency seed). • Zambia’s labels appear to align with SADC.

	<ul style="list-style-type: none"> The SADC Seed Centre has published a Procedure Manual for Accreditation and Certification System for the SADC Region to facilitate implementation. 	
Comparison of COMESA and SADC Harmonization on Trade and SPS		
<p>COMESA</p> <p>COMESA member states are bound by its regulations, but countries must domesticate the agreements through national legal instruments and mechanisms before they can take full effect.</p> <p>Trade and SPS harmonization is covered in the COMESA Seed Trade Harmonization Regulations 2014 (Chapter 5).</p>	<p>Regional Status</p> <ul style="list-style-type: none"> Covered in Chapter 5 of the 2014 COMESA Seed Regulations. Universal pest list exists. <ul style="list-style-type: none"> Maize requirements are under review. 	<p>National Implementation</p> <ul style="list-style-type: none"> Zambia does not reference the COMESA pest list in its Seeds Act or Regulations. The seed import form in Zambia's 2018 Seeds Regulations appear to align with COMESA rules.
<p>SADC</p> <p>Most SADC instruments are not legally binding (with the exception of protocols which are legally binding and must be domesticated through national law). Among the non-binding measures are MoUs, such as the MoU to implement the SADC HSRS.</p> <p>Countries may choose to domesticate the regional principles contained in an MoU.</p>	<p>Regional Status</p> <ul style="list-style-type: none"> SADC Quarantine and Phytosanitary Measures contain (i) pest control list for seeds traded among SADC members and (ii) pest control list for seeds imported into SADC countries from outside the region (universal pest list). Members are also encouraged to recognize alternate methods that provide the equivalent level of pest control. A common pest list for seed inspections is also being developed. SADC has prepared two sets of pest lists, one for pests that require control when seed is traded among SADC members and another for seed coming from outside the region (Keyser, 2013). The SADC Plant Protection Sub- committee provides technical support. The SADC Seed Centre has published a Seed Import/Export Procedures Manual for Government Agencies to facilitate implementation. 	<p>National Implementation</p> <ul style="list-style-type: none"> Zambia does not reference the SADC pest lists in its Seeds Act or Regulations. Zambia has not yet referenced the SADC seed import and export rules in its national seed framework.