



联合国
粮食及
农业组织

Food and Agriculture
Organization of the
United Nations

Organisation des Nations
Unies pour l'alimentation
et l'agriculture

Продовольственная и
сельскохозяйственная организация
Объединенных Наций

Organización de las
Naciones Unidas para la
Alimentación y la Agricultura

منظمة
الأغذية والزراعة
للأمم المتحدة

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 3 of the Provisional Agenda

INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Ninth Session

25-27 July 2018

REVIEW OF THE STATUS AND TRENDS OF SEED POLICIES AND SEED LAWS

Table of Contents

	Pages
I. INTRODUCTION.....	2
II. RATIONALE AND METHODS.....	2
III. POTENTIAL EFFECTS OF LEGAL INSTRUMENTS ON THE DIVERSITY OF PGRFA.....	4
IV. CONCLUSIONS.....	11
APPENDICES.....	13
Appendix I - List of Questions.....	13
Appendix II - Countries and regional legislative unions included in review.....	15
Appendix III - Tables of findings.....	17

*This document can be accessed using the Quick Response Code on this page;
an FAO initiative to minimize its environmental impact and promote greener communications.
Other documents can be consulted at www.fao.org*



I. INTRODUCTION

1. At its Sixteenth Regular Session¹, the Commission on Genetic Resources for Food and Agriculture, in reviewing its Multi-Year Programme of Work, decided to consider a review of the status and trends of seed policies at its next session.²

2. This document describes the conduct of this review and contains its key findings. In a first step, the seed policy review focuses on areas where seed policies may have actual impact on plant genetic resources for food and agriculture (PGRFA). Therefore, a first set of typical scenarios, such as those in which laws and policies affect multiplication or sale of seeds of farmers' varieties/landraces, was identified and the review focuses on specific aspects of seed laws that are of particular interest to PGRFA conservation and use.

II. RATIONALE AND METHODS

Seed laws and PGRFA

3. The primary purpose of seed policies, laws and regulations³ is to provide assurance of the quality and varietal identity of seeds and planting materials. Seed legislation usually aims to protect farmers as consumers of seeds. This is particularly important as from their external appearance it is often impossible to draw any conclusions as to the characteristics or quality of seeds. Seed legislation therefore usually provides for some form of inspection and testing procedures which aim to assure seed quality and the presence of specific characteristics and performance.⁴ Seeds legislation also aims to support seed producers and vendors by establishing governance mechanisms for the sector, which typically include the enforcement of fair competition. For the administration and enforcement of seed legislation, countries usually designate competent authorities and mandate them with the enforcement of seed production and quality standards. The competent authorities together with the seeds and planting materials they regulate, and the chain of organisations that breed, produce, market and distribute the seeds under the applicable seed legislation comprise what is commonly considered the formal seed system.⁵

4. Seed legislation usually includes provisions for variety registration, where a variety's performance is assessed, and its characteristics described, before it can be entered onto a list of varieties eligible for commercial production and sale. In addition, seed legislation usually regulates the quality of seeds and provides a system for assuring seed quality in terms of genetic purity (true-to-type), analytical purity (freedom from contamination) and germination. The most common system for seed quality control is certification, where a neutral third party inspects seed production, and certifies the variety identity and quality of the seed lots produced for sale. However, in some countries there are seed quality systems in place which set quality standards without providing for mandatory inspections.

5. In many countries, particularly developing countries, a large proportion, if not most of the seeds and planting materials are sourced from farmers' seed systems, i.e. from farmers' own harvests and through exchanges or sales among farmers and from local markets.⁶ Through these systems seeds of farmers' varieties/landraces and released crop varieties, often initially sourced from the formal system,

¹ CGRFA-16/17/Report/Rev.1

² CGRFA/WG-PGR-8/16/6

³ For simplicity, 'seed legislation' will be used here to refer to all policies, laws and regulations applying to seeds.

⁴ Voluntary Guide to National Seed Policy Formulation

⁵ Louwaars, N. 2007. *Seeds of Confusion: the impact of policies on seed systems*. PhD dissertation, Wageningen University. <http://library.wur.nl/WebQuery/wurpubs/fulltext/121915>

⁶ McGuire, S. & Sperling, L. 2016. Seed systems smallholder farmers use. *Food Security*. 8(1): 179-195.

are supplied. Farmers' seed systems are an important component of the management of PGRFA, particularly the on-farm diversity of farmers' varieties/landraces.⁷

6. While seed legislation is usually mainly concerned with regulating the formal seed sector, it may have direct or indirect impacts on the functioning of farmers' seed systems.^{8,9} This is the case, where seed legislation prohibits the sale or even non-commercial exchanges of seeds of plant varieties that are not included in the national or regional varietal list. As it will often be difficult or even impossible to register farmers' varieties/landraces in the official variety lists, such bans may hinder the conservation and sustainable use of PGRFA.^{10, 11} As countries revise their seed laws in many parts of the world to harmonize them with regional or international standards and enhance trade in seeds, concerns have been raised over the impact such harmonization may have on the exchange of seeds and thus the diversity of farmers' varieties/landraces grown in farmer fields.¹²

7. Stringent and cost-intensive registration procedures for seed producers may also restrict the number and diversity of seed producers, including of farmers' groups or local enterprises that could otherwise participate in the formal seed system. Such conditions may affect the range of actors receiving official recognition and support, and ultimately the diversity of PGRFA produced and promoted through these channels. Alternative quality assurance schemes, such as Quality Declared Seed¹³, have therefore been proposed to facilitate a more decentralised and diverse seed sector, potentially including farmers' seed groups that multiply locally popular varieties. Such alternative quality assurance schemes might, however, in many cases run counter to the official seed certification legislation.

Methods

8. Recent reviews of seed laws and their impacts on PGRFA mostly focused on a single region or set of countries.¹⁴ While the methodologies of these reviews varied, they were usually based on country case studies. For the purpose of identifying global trends of seed legislation, and their possible impacts on the diversity of PGRFA grown by farmers, a different approach has been chosen.

9. This global review analysed seed legislations of a large number of countries. The review focused on provisions which directly or indirectly restrict or ban the commercialization or use of seeds of farmers' varieties/landraces and may thus constrain the exchange of seeds within farmers' seed systems and/or the on-farm use and conservation of farmers' varieties/landraces. The review focused in addition on provisions, such as registration requirements, that may affect the participation of small-scale farmers or of farmers' organisations in the formal seed sector.

⁷ CGRFA-16/17/Inf.18

⁸ Visser, B. 2017. The impact of national seed laws on the functioning of small-scale seed systems. A country case study. Amsterdam: Oxfam-Novib. https://www.sdhsprogram.org/assets/wbb-publications/770/Seedlawstudy_Bert%20Visser.pdf

⁹ La Via Campesina and GRAIN. 2015. Seed laws that criminalise farmers: resistance and fightback. <https://www.grain.org/article/entries/5142-seed-laws-that-criminalise-farmers-resistance-and-fightback>

¹⁰ ISSD Africa. 2017. The support for farmer-led systems in African seed laws. Synthesis paper. <http://hdl.handle.net/10568/81545>

¹¹ Rajendran, S., V, Afari-Sefa, D.K. Karanja, R. Musebe, D. Romney, M.A. Makaranga, S. Samali, and R.F. Kessy. 2016. Farmer-led seed enterprise initiatives to access certified seed for traditional African vegetables and its effect on incomes in Tanzania. *International Food and Agribusiness Management Review*. 19(1): 1-24.

¹² African Centre for Biodiversity. 2018. Towards national and regional seed policies in Africa that recognise and support farmer seed systems. Policy Discussion Document. http://acbio.org.za/sites/default/files/documents/Seed_Policies_in_Africa_report_WEB.pdf

¹³ <http://www.fao.org/docrep/009/a0503e/a0503e00.htm>

¹⁴ In addition to previously cited reviews, other examples include: i) Vernooij, R. 2016., Options for national governments to support farmer seed systems. The cases of Kenya, Tanzania and Uganda. Hivos and Bioversity International. <http://hdl.handle.net/10568/80762>; ii) Otieno, G.A., T.W. Reynolds, A. Karasapan, and I. Lopez Noriega. 2017. Implications of seed policies for on-farm agro-biodiversity in Ethiopia and Uganda. *Sustainable Agricultural Research* 6(4): 12-30.; iii) CTA 2014. Seed Systems, Science and Policy in East and Central Africa. <http://hdl.handle.net/10568/81086>.

10. The review analysed seed legislation as to the following parameters, which have been identified as relevant to on-farm diversity of PGRFA¹⁵: i) the scope of the seed legislation; ii) the need for varieties to be registered prior to their commercialization; iii) the existence of a seed quality control system; and iv) representation of farmers in the governing bodies of national seed authorities. A corresponding list of 15 questions was developed as a checklist against which the provisions of legal instruments would be queried to ascertain their probable impacts on the diversity of PGRFA. For each question, a set of possible answers, reflecting the range of existing scenarios, was provided. A code was assigned to each possible answer. All but two of the questions allowed for only a single answer. The questions and their respective answer codes are provided in Appendix I to this document.

11. FAOLEX,¹⁶ the database of national legislations on food and agriculture hosted by FAO's Legal and Ethics Office, was used as the sample frame for reviewing national seed legislation. As of March 2018 when the review was conducted, the FAOLEX database contained over 4 000 documents on legislations pertaining to seeds and planting materials for 171 countries and regional legislative unions. This review considered 129 countries and regional unions whose documents were in one of the four most common languages of the database: English, French, Spanish or Russian. For 35 of these countries, the FAOLEX database did not include any legal document that could be queried with the 15 questions of this study; these countries were excluded from the analysis.¹⁷ The review therefore included 94 countries and two regional organizations with capacity to approve legislation that is directly applicable in their member states – the Andean Community, and the European Union (Appendix II).

12. For each country, the provisions of all available documents were reviewed against all the questions on the checklist and the answers recorded using the appropriate code in an Excel sheet. There was a separate worksheet for each country within which answers were recorded in a separate column for each instrument, along with any relevant comments. In a few countries, individual legal documents gave different answers to the same question; in such cases the comments helped clarify which legal document was the most up-to-date, and that answer was taken as final. The final answers for each country were then combined into a master worksheet which listed the answer codes for all 96 countries/regional legislative unions. This was used to tally the frequency of responses to individual questions. The interactions between two or more questions were also recorded and analysed (e.g. in instances of a seed law stipulating that both the registration of all commercialized varieties and seed certification were compulsory).

III. POTENTIAL EFFECTS OF LEGAL INSTRUMENTS ON THE DIVERSITY OF PGRFA

13. The provisions of the seed legislations are discussed below according to the 15 questions on the checklist. The summary of the findings are tabulated in Appendix III.¹⁸

Scope of Seed Legislation

Question 1: What is the scope/objective of the seed law?

14. This question explored whether the national seed legislations explicitly defined the target of their regulation and, if so, to which extent. Overall, the seed legislations of 45 percent of the countries applied to all seeds and planting materials of every crop species. For 42 percent of countries, the legislation applied only to certified seeds. These were made up of 36 percent that regulated certified

¹⁵ <http://www.fao.org/3/a-i4916e.pdf>

¹⁶ <http://www.fao.org/faolex/en/>

¹⁷ Some of these countries may have a current seed law which was not included in the FAOLEX database, or their seed regulation may be embedded into a broader legal instrument.

¹⁸ For most questions frequencies were a percentage of 96 answers (from 94 countries and two regional associations). Six questions did not have answers from every country; for these, percentages were of the available responses (minimum of 93 in all cases).

seeds of all crops and 6 percent that regulated certified seeds of only a defined set of crop species. The scope of seed legislation of 13 percent of countries was not specified or was unclear.

15. The variations in the scope of seed legislation indicated that there were diverse approaches to regulating the sector. For the 42 percent of countries whose legislations applied exclusively to certified seeds, variety registration and quality control requirements applied to the formal seed sector only. In these countries, farmers' seed systems and the exchange of seeds of farmers' varieties/landraces are unaffected by the seed legislation. For this set of 42 percent of countries, direct restrictions on the use of farmers' varieties or landraces are not to be expected. However, policies that promote the development of the formal seed sector and of crop varieties developed in this sector may affect PGRFA indirectly, for instance, by contributing to a decreased use of farmers' varieties/landraces.

16. From the documents available on FAOLEX, 45 percent of countries applied their seed legislation to all seeds and planting materials of every crop species, as the review did not find any provision in the relevant seed legislations that explicitly exempted specific PGRFA or seed transactions from the scope of national legislation. The implication of this wide scope is that sales and other exchanges of landraces/farmers' varieties among farmers were regulated. This does not necessarily mean that legislators in all these countries intended to regulate all seed or seed transactions. However, on the face of the documents available, it is not directly apparent which seed or seed transactions remain unaffected by the seed legislation.

17. For the 13 percent of countries that did not specify the scope of their seed legislation it will be difficult to draw conclusions regarding the potential effect on diversity.

Variety Registration System

18. In most countries, a variety must be registered in the "national variety list" or "national variety catalogue" to be eligible for commercial production and sales. A national listing procedure is a potentially useful tool as it allows only one name to be associated with a variety, attributes are measured in agronomic performance trials and a full variety description is recorded in the national variety list for future reference or the resolution of conflicts.

Question 2: Is it required that varieties must be registered in order to be commercialized, i.e. marketed?

19. The seed legislations of nearly three quarters of countries stipulated that the commercial production and sale of seeds and planting materials were only authorized for crop varieties that were registered in the country. Most of these countries (63 percent) applied this registration requirement to all crops, while 11 percent required compulsory variety registration only for some species. For the remaining 26 percent of countries, the available instruments either did not mention variety registration or their requirements were unclear.

20. The requirement to register a variety before seeds or other propagating materials of that variety may be commercialized indicated a strict system that will usually make the commercialization of farmers' varieties/landraces difficult, if not impossible. If farmers' varieties/landraces cannot be registered and therefore their seeds no longer be commercialized, their conservation and sustainable use may be at risk.

Question 3: What are the requirements for registering a new variety?

21. There were multiple answers to this question. The laws of 69 percent of the countries studied specifically required that for a variety to be registered it had to meet the requirements of distinctness, uniformity and stability (DUS). The laws of 37 percent of the countries studied required, at least for specific crops, a test for value for cultivation and use (VCU). Both DUS and VCU trials were required before registering a variety in 31 percent of countries. The laws of few countries (10 percent) required in addition that the variety caused no harm to the environment. The laws of 24 percent of the countries

studied did not indicate any registration requirements, or, in a few cases, indicated registration requirements other than DUS or VCU testing.

22. The DUS requirements and mandatory VCU testing may constitute significant hurdles for the registration of farmers' varieties/landraces which will usually not fulfil these criteria. While the DUS criteria may be interpreted in various ways, the VCU requirement usually requires an added value of the variety (most often in terms of yield) compared to other registered varieties of the same species.

Question 4: Is the demonstration of a minimum yield in VCU trials a requirement for the approval or registration of a variety?

23. This question examined whether the seed laws of countries studied required for a variety to be registered a particular level of yield performance or "value in cultivation and use". Only 4 percent of countries required a minimum yield as part of the VCU, while another 4 percent required a minimum yield for a specific set of crops. On the other hand, 17 percent of the seed legislations studied explicitly did not require a variety to produce a certain minimum yield in order for it to be registered, but rather required a difference in one characteristic of interest (e.g. protein content), or only required that performance data be reported. This would imply that farmers' varieties/landraces were not obviously disadvantaged.

24. Though minimum yields were a requirement for only a few countries, when they are set on the basis of improved varieties developed through modern plant breeding methods, farmers' varieties/landraces are less likely to meet the stipulated yardsticks. Even though farmers' varieties/landraces may have desirable traits other than those measured under the VCU test, the VCU could present a significant hurdle to their registration as farmers' varieties/landraces will usually not outperform the other registered modern varieties.

25. VCU requirements were not clearly described in 74 percent of countries. However, this does not necessarily mean this criterion is absent as it may simply form part of the administrative approval practice of the national seed authority rather than being spelt out explicitly in the legislation.

Question 5: Is the registration of the variety a requirement for imported seeds?

26. Over half of the laws studied required that prior to commercialization varieties of imported seeds have to be registered in the country of import. This requirement applied to all crops in 44 percent of the countries while 7 percent of countries required variety registration only for seeds of a specific set of crops. In 16 percent of the countries studied, seed laws did not require variety registration for imported seeds, although most laws required that import of seeds must be "authorized". It was unclear which criteria a variety has to meet to be "authorized". The seed laws of a third of the countries studied were silent on variety registration for imported seeds.

27. As farmers' varieties/landraces are unlikely to be registered, variety registration as requirement for import of seeds may ultimately be prejudicial to the diversity of PGRFA on-farm.

Question 6: Can landraces or farmers' varieties be registered?

28. Twenty-nine percent of the countries studied allowed explicitly for the registration of farmers' varieties/landraces. In the remaining 71 percent of countries, the laws did not explicitly mention the possibility to register them. However, it would appear most countries did not rule out the possibility of registering farmers' varieties/landraces, provided they meet the relevant criteria.

29. Again, valid inferences can only be made when the applicable administrative practices are considered in concert with the legislation, regulations and/or policies. Nonetheless, it could be averred that the registration of farmers' varieties/landraces may be conducive to increased diversity of PGRFA available to farmers and grown on farmer fields.

30. Overall, it can be concluded that most of the countries whose seed laws were studied (74 percent) specifically required registration of varieties prior to their commercialization. The requirement of DUS as a precondition for variety registration was also prevalent in a majority of the countries (69 percent). Both requirements, variety registration and DUS, were in effect in 47 (or 49 percent) of the countries. On face value, the diversity of PGRFA would be negatively affected by the combined effects of both variety registration and DUS requirements. However, given that variety registration is based on decisions by variety release committees and so subject to varying degrees of flexibility, it is difficult to make blanket statements on probable effects of the registration requirement across countries. For instance, in some jurisdictions and circumstances, varieties that were combinations of different DUS varieties (multilines) have been registered.¹⁹ Also, of the 47 countries that required variety registration and DUS, 20 also allowed in principle for the registration of farmers' varieties or landraces. It was not clear from the seed laws of these countries whether the registration requirements for farmers' varieties/landraces were different from the usual DUS requirements.

Seed Quality Control

31. Countries have adopted different systems for seed quality control, all of them aimed at ensuring that farmers plant what they expect. One quality control system is seed certification (voluntary or compulsory) whereby a neutral body, i.e. without a stake in the production or use of the seeds, carries out inspections all through the production process and certifies the quality. Seed certification systems may vary in number of inspections of a seed lot but always seek to confirm if the variety is true-to-type, and to confirm the quality of the seed lot with respect to germination, health and absence of contaminants.

32. An alternative to seed certification provides for quality control systems that are operated by the seed producers themselves. Like seed certification, these seed quality control systems apply to registered varieties and are based on pre-established minimum quality standards. However they operate without third-party inspection. Truth in labelling is a variation of this latter system but without a minimum quality standard: the producer simply provides information about the quality of the seed lot. Yet another quality control system is Quality Declared Seeds, which has a less intensive third-party inspection regime, and usually slightly lower quality standards, than applied by seed certification systems. Quality Declared Seeds systems complement systems for seed certification, are most applicable to low input production systems, and are seen as a transition phase between the informal and formal seed systems. Countries may apply different quality control approaches, seed certification, quality declaration or self-control, to different plant species. The impacts of seed quality control systems on the diversity of PGRFA are discussed below.

Question 7: Is seed certification compulsory?

33. Seed certification, in accordance with the documentation analysed, was compulsory for all crops in 30 percent of the countries studied. A similarly large group of the countries studied (32 percent) required seed certification only for a defined group of crops. Some countries did not require the compulsory certification of seeds (18 percent) while for 20 percent, the documentation was not conclusive as to whether or not seed certification was required.

34. Only seeds of registered varieties can be certified. Compulsory seed certification therefore exerts an indirect impact on the diversity of PGRFA comparable to the impact of compulsory variety registration.

¹⁹ E.g. Allan, R.E., C.J. Peterson, R.F. Line, G.L. Rubenthaler, and C.F. Morris. 1993. Registration of 'Rely' wheat multiline. *Crop Science* **33**: 213-14.; see also Litrico, I., and C. Violle. 2015. Diversity in plant breeding: a new conceptual framework. *Trends in Plant Science*. **20** (10): 604-613.

Question 8: Is quality control compulsory for any seed that is to be commercialized?

35. At least some form of seed quality control, though not necessarily through certification, was required in 77 percent of the countries studied. 62 percent of these countries apply their seed quality control scheme to all crops while 15 percent of them provided mandatory seed quality control only for a defined set of crops. According to the documentation available, 23 percent of countries did not require any seed quality control.

36. Like seed certification, compulsory seed quality control, is difficult or impractical to implement for small-scale farmers. Thus, even if a farmer's variety /landrace clears the hurdle of registration, compulsory seed quality control will often make it difficult, if not impossible for small-scale farmers to commercialize seeds, and thus diminish the diversity of available PGRFA, even though to a lesser degree than a blanket requirement for certification.

Question 9: Is a minimum area for seed production a condition for field inspections?

37. Seed legislation may prevent small-scale farmers or farmers' associations from marketing seeds of their varieties/landraces because they fail to fulfil specific seed production standards which are required under seed quality control or seed certification rules. Driven by the desire to achieve cost-efficiency for seed lot inspections, the seed laws of some countries defined a minimum size of the seed lot for field inspections.

38. However, only 2 percent of countries required that seed lots be planted in an area of a specified minimum size to be eligible for inspection, while 4 percent stated explicitly that there was no such requirement. Laws of the remaining 94 percent of countries did not specify a minimum size of the area to be inspected.

39. While the requirement of a minimum-size for the area of seed lots for field inspections may prevent farmers and other producers who typically multiply seeds on small plots from operating in the formal seed system, it seems that such a requirement does not exist in most countries.

Question 10: How is the sale of non-certified seeds considered?

40. This question examined whether countries' legal frameworks had specific provisions on non-certified seeds. This could be through the definition of a category of seeds of registered varieties that does not need to be certified or by waiving this requirement entirely. While 17 percent of the countries studied did not restrict the production and sale of non-certified seed of any crops, in 25 percent of the countries commercial production and exchange of uncertified seeds was permitted only for a selected group of crops.²⁰ Twenty-nine percent of countries explicitly banned the sale of seeds that were not certified. For a similarly large group of countries, the documentation available was inconclusive as activities involving uncertified seeds were either not addressed or their treatment was unclear.

41. Bans of commercial production and exchange of uncertified seeds, as they are common in a number of countries for at least certain crops, may have a negative impact on the diversity of farmers' varieties/landraces used and conserved by farmers. Thus, even if a farmer's variety/landrace is registered, the ban on the commercial production and sale of uncertified seeds might make it legally risky for farmers to produce and exchange seeds of their varieties/landraces on a commercial basis.

Question 11: Is there a quality standard other than certified seed?

42. Thirty-four percent of countries applied seed certification as the sole quality standard. A further 40 percent of countries required compliance with quality standards other than certification.

²⁰ An example of this derogation is in the European Union, which does not require certification for vegetable seed, or for Conservation Varieties (farmers' varieties/landraces registered as such and produced and sold locally); Commission Directive 2008/62/EC.

The documentation of the remaining 26 percent of countries, as available in the FAOLEX database, did not provide information on this question.

43. In the absence of a rigid seed certification regime, seed producers are required in many countries to comply with alternative quality standards even though compliance with these standards is not always monitored or enforced by competent authorities. Some countries recognised Quality Declared Seeds as a quality standard and defined the degree of intervention or control by the national seed authority in that standard. Other countries set out clear rules that required seed producers to label their seeds, comply with the quality standards and provide farmers through accurate labelling with the necessary information.

44. Quality Declared Seeds have an advantage in terms of conservation and use of farmers' varieties/landraces as they set lower and easier-to-meet quality standards for seed producers and traders. In addition, the quality standard of Quality Declared Seeds requires less testing and administration, which generally results in costs that are lower than the costs of a fully-fledged seed certification scheme. The quality standard of Quality Declared Seeds is, thus, more accessible and user-friendly for small-scale farmers, farmer-breeders and seed producers.

Question 12: Are there specific provisions for small farmer seed producers?

45. The laws of about 19 percent of countries provided for specific incentives or discounts for small-scale farmers or small-scale farming enterprises, such as lower fees for seed inspections or variety registration. The remaining 81 percent of countries did not seem to provide for such incentives in their seed laws.

46. In general, incentives or discounts may help small-scale farmers or seed producers to market seeds of their varieties and thus to conserve them.

Question 13: Are farmers' seed systems recognised?

47. Farmers' seed systems were explicitly recognised in the seed legislations of 40 percent of the countries studied while the seed laws of the remaining 60 percent were silent on this matter.

48. The explicit authorization for farmers to save or sell seeds from their own produce and references to the roles of farmers' seed systems in the conservation and sustainable use of PGRFA were ways to recognise farmers' seed systems. It may be inferred that such overt recognition of farmers' seed systems, and by extension the farmers' varieties/landraces that they manage, signify an enabling environment for the enhanced diversity of PGRFA on-farm.

49. The nature of the requirements for seed quality control affects the cost of producing and selling seeds or planting materials. A majority (62 percent, Question 7) required seed certification for some or all species. The financial costs and administrative requirements for this may restrict the diversity of PGRFA if they limit the range of crops and their varieties that are traded formally or the diversity of organizations (such as farmer-led enterprises) that engage in seed trade. For the 40 percent of countries that accepted alternative quality standards (Question 11), the resulting simplicity and flexibility of seed production should increase the diversity of available seeds. Where this enables the promotion and dissemination of quality seeds of crops and their varieties that would otherwise not have been produced through a certification-only system, the diversity of PGRFA is enhanced. However, the impacts of certification and of alternate standards on the diversity of PGRFA will depend on levels of implementation of the regulations and therefore merit closer study.²¹

²¹ Comparisons of the costs of certified seed production and of other quality control standards such as Quality Declared Seed have only started to emerge, e.g.: ISSD. 2017. Effective seed quality assurance. Synthesis paper, Integrated Seed Sector Development. http://www.issdseed.org/sites/default/files/case/issd_africa_twg1_sp2_seed_quality_assurance_170412.pdf

50. Relevant laws of a total of 28 countries (29 percent) considered commercial exchanges of non-certified seeds illegal, making it a punishable offence to sell seeds that did not pass through a certification process. Also, 21 countries (22 percent), mostly in sub-Saharan Africa, did not mention in their seed laws the possibility for registering farmers' varieties or landraces (Question 6). This might suggest a regulatory environment that constrains the diversity of PGRFA available in formal markets. In such situations, market-based approaches would be ineffective for disseminating and promoting some types of crop diversity, particularly farmers' varieties/landraces. The possibility of registering those varieties for production and sale was uncertain in more than half (57 percent) of the countries studied. To what extent farmers' varieties/landraces with their distinctive features may actually in practice be registered should be the subject of a more in-depth study.

Representativeness of Decision Making Bodies

51. Seed legislations of some countries provided for the involvement of farmers and seed producers in advisory bodies or even in the decision-making of governing bodies of national seed authorities charged with the implementation of the seed legislation. Such arrangements may help to reflect the needs and interests of relevant stakeholders in the implementation of seed legislation. The review of the documents excluded bodies that had only advisory roles.

Question 14: Is the national seed authority required to have representation on its board from specific stakeholders?

52. Multiple answers were possible for this question. Under the laws of 35 percent of the countries studied, representatives of seed producers had to be represented in the governing council or board of the national seed authority and the laws of 28 percent of the countries required seed consumers (farmers) to be represented in these bodies. The laws of 61 percent of countries either did not specify the composition of the governing board of their national seed authority or did not foresee the representation of seed producers or farmers in the governing board of the national seed authority. Some countries (14 percent) explicitly required small-scale farmers to be represented on the board (normally representing cooperatives, or farmers' associations). Most of the latter countries are in Africa, few in Asia, none in Latin America.

53. The representation of small-scale farmers and seed producers on decision making governing bodies of national seed authorities may enhance the probability of decisions that are favourable to the interests of small farmers. Whether the representation of small-scale farmers in governing bodies of national seed authorities correlates with availability of farmers' varieties/landrace is a question that could be studied in more depth.

54. The representation of farmers on a national seed authority could potentially be both advantageous and risky. This is because, though it is important to have the perspectives of seed users when making decisions about seed production, there are also grounds for conflicts of interest when farmer representatives are themselves also seed producers.

Question 15: Is there a requirement for the registration of seed producers?

Relevant laws of nearly three quarters of the countries studied required seed producers to be registered in order to operate; 53 percent required registration for seed producers for every crop, and 21 percent made this a requirement only for some crops. The laws of 26 percent of the countries studied did not require seed producers to be registered as such.

A registration requirement for seed producers may affect the ability of small-scale farmers or farmer groups to produce and market seeds at a commercial scale. This is particularly true where direct or indirect costs and fees for registration are prohibitive.

Multiple aspects of seed legislation in combination

55. Finally, this review examined the impact of interactive effects of the provisions studied and their potential impacts on farmers' ability to exchange or sell farmers' varieties/landraces.

56. The analysis of Question 1 identified 45 percent of countries where the scope of seed legislation applied to all seeds and planting materials in the country. Additionally, Question 2 revealed that 63 percent of countries required the registration of all varieties sold commercially. Furthermore, 71 percent of the countries reviewed did not specify any provision for registering farmers' varieties or landraces, as inferred from Question 6. Taken in combination, 14 percent of countries included all seed and planting materials in the scope of their legislation, and had a compulsory registration system, and also did not have any provision for registering farmers' varieties/landraces. It may be that the registration of farmers' varieties/landraces is still possible in this set of countries, provided certain criteria were met. But, in such a scenario, the criteria may ultimately be so stringent as to de facto prevent the commercial exchange of farmers' varieties/ landraces.

57. As deduced through Question 2 above, 63 percent of countries had a compulsory registration system for varieties of all crops. Through Question 13, it was similarly revealed that 40 percent of countries recognized farmers' seed systems. Taken together, 26 percent of countries had a compulsory registration system and also recognized farmers' seed systems in their legal documents. This indicated the existence of a possible scope for supporting different seed systems alongside formal commercial systems in these countries. However, this also suggested that the policy goals of regulating all commercial seeds on the one hand and recognizing farmers' seed systems, on the other, may not always be compatible.

58. Similarly, 28 percent of the countries required both the compulsory registration of all varieties and also the certification of all seeds of all crops as a condition for selling them. All of these countries, apart from four, were from the former Soviet Union or are in sub-Saharan Africa. This combination implied a system which had total control over which varieties are released and how they are multiplied.

59. Interestingly, 22 countries (23 percent of total) also made no reference in their legal framework to recognizing farmers' seed systems. The three-way combination of the non-recognition of farmers' seed systems, compulsory variety registration and seed certification could impact negatively on the diversity of PGRFA. Farmers' varieties and landraces, if they are not registered, may remain outside the scope of law, while a blanket certification requirement may restrict farmer groups or smaller-scale seed producers from participating in the formal seed sector.

60. Some countries specifically allowed the registration of farmers' varieties/landraces and also recognised farmers' seed systems in their legislation (questions 6 and 13). This combination was found in 19 countries (20 percent). Further exploration of the implementation of this combination could contribute to a better understanding of the relationships between legislative frameworks and the diversity of PGRFA on-farm.

IV. CONCLUSIONS

61. This review of the legislative frameworks, based on an analysis of their scope, variety registration requirements, quality control regimes, and the representation of (small-scale) farmers/seed producers in decision-making bodies demonstrates that, notwithstanding clear tendencies towards global harmonization, seed laws of the 94 countries analysed varied widely.

62. The findings of the study were largely indicative. In analysing the legal situation in the different countries, no attempt was made to go beyond the documentation available in FAOLEX. This meant, for example, that it remained unclear for many countries whether farmers' varieties/landraces could be registered and seed of such varieties be produced and exchanged on a commercial basis as the legislation itself does often not disclose this kind of information. The fact that farmers' varieties/landraces were not

mentioned in many seed laws does not necessarily mean that they cannot be registered and that seeds of such varieties cannot be commercialized. It is also important to note that in some countries seed legislation is not fully enforced and that, therefore, seeds of unregistered varieties or seeds that do not meet the required quality standards are used and exchanged by farmers.

63. It should also be noted that many factors affect the diversity of PGRFA directly or indirectly and it is therefore difficult to make rigorous claims about the impacts of seed policies in isolation. A follow up to the current study could investigate whether, in fact, seed legislation that accepts or aims to incentivize the continuation or proliferation of informal seed delivery systems actually had this effect and if it had, which impact this had on the diversity of farmers' varieties/landrace actually available to and grown by farmers.

64. The results of this study should be interpreted with caution. It might appear, for example, that on-farm PGRFA diversity would flourish in the 29 percent of the countries where the seed legislation explicitly provided for the possibility of registering farmers' varieties/landraces in the regular or a separate variety list²². However, possibilities provided by the law do not necessarily reflect the reality on the ground. Whether the possibility to register farmers' varieties/landraces implies a greater choice of varieties available to and actually used by farmers and whether this ultimately contributes to the conservation of PGRFA is unclear and needs to be further examined.

65. There were many countries that exempted specific practices within farmers' seed systems from the scope of their seed laws. The nature of such exemptions varied considerably among countries.²³ Some countries exempted, for example, seed sales among farmers from their seed legislation. Other countries only exempted non-commercial seed exchanges or barter arrangements from their seed laws. Some countries exempted informal seed sales; others regulated them. A comparison between countries that regulate specific practises typical for farmers' seed systems and countries that do not regulate them and an analysis of the effects of these two regulatory approaches on the conservation of PGRFA could therefore be useful.

66. It would also seem that the extent of participation of small-scale farmers in seed production and the corollary, on-farm diversity of PGRFA, would be limited by strict institutionalized quality control regimes. While this may ultimately be the case, there is a need to generate empirical data. Again, this indicates a need to go beyond the letters of the provisions of statutes and investigate their actual levels of implementation. Even after establishing that the provisions are actually implemented at significant scales, a correlation between the extent of implementation and actual on-farm diversity would have to be established while accounting for other factors, such as climate, demographics, market forces, etc.

67. The effects of stakeholder representation in governing boards of national seed authorities on the registration of farmers' varieties/landraces, the production and sale of seeds of such varieties, and on the choice of farmers and the diversity grown in farmer fields are another issue that could be further explored in a comparative analysis.

68. Based on the documents reviewed, it was noted that seed laws frequently lacked clarity on key provisions that could affect the functioning of the seed sector and, possibly, the diversity of PGRFA. In these cases, the availability of guidelines for the development of national seed legislations may help to ensure that key provisions affecting the seed sector are clearly defined and that all important aspects are properly addressed.

²² Examples include Benin, Burundi, the European Union, Malaysia, Niger, Thailand and Switzerland, which provide for separate lists to register varieties defined as "traditional", "niche", "conservation", or "local".

²³ On the range of exemptions, and difficulties in defining exemptions, see also: Prip, C. and O.K. Fauchald. 2016. Securing crop genetic diversity: Reconciling EU seed legislation and biodiversity treaties. Review of European Community and International Environmental Law. 25 (3): 363-377; Visser, 2017; ISSD, 2017.

APPENDICES

Appendix I - List of Questions

Area of concern	Question	Possible answers
Scope of Law	1. What is the Scope/Objective of the seed law, i.e. what, specifically, does it regulate?	a) All seeds in the country irrespective of certification
		b) Certified seeds only, for all crops
		c) Certified seeds only, but for some crops (specify)
		d) Not clear
		e) Not specified
Variety Registration	2. Is it required that new varieties must be registered in order to be commercialized, i.e. marketed?	a) Yes, for all crops
		b) Yes, but only for some crops (specify)
		c) No
		d) Not clear
		e) Not specified
	3. What are the requirements for registering a new variety? (more than one answer possible)	a) Distinct, Uniform and Stable characteristics (DUS)
		b) Value for Cultivation and Use (VCU)
		c) Other (specify)
	4. Is the demonstration of a minimum yield in VCU trials a requirement for the approval or registration of a variety?	a) Yes, for all crops
		b) Yes, but only for some crops (specify)
		c) No
		d) Not clear
		e) Not specified
	5. Is the registration of the variety a requirement for imported seeds?	a) Yes, for all crops
		b) Yes, but only for some crops (specify)
c) No		
d) Not clear		
e) Not specified		
6. Can Landraces or Farmers' Varieties be registered?	a) Yes	
	b) No	
	c) Not clear	
	d) Not specified	
Seed Quality Assurance	7. Scope: Is seed certification compulsory?	a) Yes, for all crops
		b) Yes, but only for some crops (specify)
		c) No
		d) Not clear
		e) Not specified
	8. Is quality control compulsory for any seed that is to be commercialized?	a) Yes, for all crops
		b) Yes, but only for some crops (specify)
		c) No
		d) Not clear
		e) Not specified
	9. Is a minimum area for seed production a condition for field inspections?	a) Yes (Specify)
		b) No
c) Not specified		
	a) Authorized for all crops	
	b) Authorized (If only for specific crops, specify which ones)	

	10. Is the sale of Non-Certified Seeds considered:	c) Illegal (If only for specific crops, specify which ones)	
		d) Not clear	
		e) Not specified	
	11. Is there a minimum quality standard other than certified seed?	a) Yes – specify (e.g. QDS)	
		b) No	
		c) Not specified	
	12. Are there specific provisions for small farmer seed producers (e.g. Lower cost for inspections or for variety registration)?	a) Yes (Specify)	
		b) No	
		c) Not specified	
	13. Are Farmers' seed systems recognized?	a) Yes (explain)	
		b) No	
	Representation	14. Is the national seed authority required to have representation on its board from (more than one answer possible):	a) Seed producers
			b) Seed consumers (farmers)
c) Small farmers' organizations			
d) No mention of any of these groups			
e) Requirements for board representation not given			
15. Is there a requirement for the registration of seed producers?		a) Yes, for all crops	
		b) Yes, but only for some crops (specify)	
		c) No	
		d) Not clear	
		e) Not specified	

Appendix II - Countries and regional legislative unions included in review

Number	Country
1	Afghanistan
2	Algeria
3	Andean Community of Nations
4	Antigua and Barbuda
5	Argentina
6	Australia
7	Bangladesh
8	Barbados
9	Belarus
10	Belgium
11	Benin
12	Bermuda
13	Bhutan
14	Bolivia (Plurinational State of)
15	Botswana
16	Brunei Darussalam
17	Burkina Faso
18	Burundi
19	Cambodia
20	Cameroon
21	Canada
22	Chad
23	Chile
24	Colombia
25	Costa Rica
26	Côte d'Ivoire
27	Cuba
28	Djibouti
29	Ecuador
30	El Salvador
31	Estonia
32	Ethiopia
33	European Union (Member Organization)
34	France
35	Ghana
36	Guam
37	Guernsey
38	Honduras
39	India
40	Indonesia
41	Ireland
42	Jamaica
43	Japan
44	Kazakhstan
45	Kenya
46	Democratic People's Republic of Korea
47	Republic of Korea

48	Kyrgyzstan
49	Lao People's Democratic Republic
50	Luxembourg
51	Madagascar
52	Malawi
53	Malaysia
54	Mali
55	Malta
56	Mauritania
57	Mauritius
58	Mexico
59	Republic of Moldova
60	Morocco
61	Myanmar
62	Nepal
63	Nicaragua
64	Niger
65	Nigeria
66	Pakistan
67	Panama
68	Paraguay
69	Peru
70	Philippines
71	Romania
72	Russian Federation
73	Rwanda
74	Senegal
75	Singapore
76	South Africa
77	Spain
78	Sri Lanka
79	Swaziland
80	Switzerland
81	Tajikistan
82	United Republic of Tanzania
83	Thailand
84	Togo
85	Tunisia
86	Turkmenistan
87	Uganda
88	United Kingdom of Great Britain and Northern Ireland (the)
89	Uruguay
90	United States of America
91	Uzbekistan
92	Vanuatu
93	Venezuela (Bolivarian Republic of)
94	Viet Nam
95	Zambia
96	Zimbabwe

Appendix III - Tables of findings

Table 1. Scope/objective of the seed legislation

Question	All seeds in the country irrespective of certification	Certified seeds only, for all crops	Certified seeds only, but for some crops	Not clear or not specified
1. Scope of seed law	45%	36%	6%	12%

Table 2. Requirements for the registration of varieties, quality control, and seed producer registration

Question	Yes, for all crops	Yes, but only for some crops	No	Not clear or not specified
2. Is it required that new varieties must be registered in order to be commercialized?	63%	11%	-	26%
4. Is the demonstration of a minimum yield in VCU trials a requirement for the approval or registration of a variety?	4%	4%	17%	74%
5. Is the registration of the variety a requirement for imported seeds?	44%	7%	16%	33%
7. Is seed certification compulsory?	30%	32%	18%	20%
8. Is quality control compulsory for any seed that is to be commercialized?	62%	15%	-	23%
15. Is there a requirement for the registration of seed producers?	53%	21%	-	26%

Table 3: Requirements for registration of varieties mentioned in seed legislation

Question	DUS	VCU	Both DUS + VCU	Not clear/ Not specified
3. What are the requirements for registering a new variety? (more than one answer possible)	69%	37%	31%	24%

Table 4. Legislation related to small farmers and landraces/farmers varieties

Question	Yes	Not clear/Not specified
6. Can landraces/farmers' varieties be registered?	29%	71%

12. Are there specific provisions for small farmer seed producers?	19%	81%
13. Are famers' seed systems recognized?	40%	60%

Table 5. Minimum area requirement for seed inspections

Question	Yes	No	Not specified
9. Is a minimum area for seed production a condition for field inspections?	2%	4%	94%

Table 6. Authorization of non-certified seed.

Question	Authorized for all crops	Authorized for some crops	Illegal	Not clear or not specified
10. How is the sale of non-certified seed considered?	17%	25%	29%	29%

Table 7. Recognition of non-certified seed standard.

Question	Yes	No	Not specified
11. Is there a minimum quality standard other than certified seed?	40%	34%	26%

Table 8. Representation on national seed authority.

Question	Seed producers	Seed consumers (farmers)	Small farmers' organizations	These groups not mentioned /representation not specified
14. Is the national seed authority required to have representation on its board from these specific stakeholders?	35%	28%	14%	61%

Table 9. Analysis of potential effect on PGRFA from a combination of aspects found in legal framework.

Potential effect on PGRFA	Instructions from the legal framework			Countries in which all instructions were found
Farmers' varieties and landraces potentially illegal	Scope of seed law is all seeds in the country irrespective of certification	It is required that new varieties must be registered in order to be commercialized with no exemption	No specific provision for registering farmers' varieties or landraces *	14%
Strict rules for variety release	Variety registration compulsory in all crops with no exemption	Seed must be certified for all crops with no exemption for it to be commercialized		28%
Possible scope for supporting different seed systems alongside formal, commercial system	Compulsory variety registration and seed certification for all crops	Recognition of farmer's seed systems		5%
Favourable legislative framework for promoting diversity	Specifically allow the registration of landraces or farmers' varieties	Recognise farmers' seed systems		20%

* This does not necessarily mean it is impossible to register farmers' varieties or landraces, provided they meet registration criteria, but this combination of provisions suggests that there may be limited scope to do this in those countries