1 Farmers’ varieties and farmers’ rights\textsuperscript{1}

Challenges at the crossroads of agriculture, taxonomy and law

\textit{Michael Halewood and Isabel Lapeña}

This book is about crop plant varieties developed by local farmers – commonly referred to as farmers’ varieties – and policies to increase the share of benefits farmers receive from the use of those varieties. These are not new subjects. Over the course of the last 50 years there has been a growing appreciation on the part of different stakeholders including biologists, activists and policy makers of the important role that farmers have played in the development and conservation of crop varieties and crop genetic diversity generally. Over successive generations of seed selection (or cutting or bud selection), exchange, and replanting across a range of environments, farmers exert selection pressures contributing to the evolution of plant populations. Farmers have domesticated wild species – indeed, they continue to do so (Scarcelli et al. 2006; Vodouhe et al. 2011) – and are largely responsible for the extraordinary genetic diversity within species (intraspécific diversity) that exists today (Brush 2004). By way of corollary, farmers’ selection can also contribute to the maintenance of a variety or population under environmental circumstances that would otherwise contribute to its gradual disappearance or extinction (Louellan 1999).\textsuperscript{2}

Farmer crop diversity management, also referred to as on-farm management, has been recognized as an important aspect of food security (Smale 2006; De Schutter 2009, 2011; Lenné and Wood 2011). The genetic heterogeneity of farmers’ varieties contributes to production system resilience in response to biotic and abiotic stresses lowering the risk of overall crop failures (Ceccarelli 2009; Altierei and Toledo 2011). Climate change is increasing the potential importance of crop diversity (and agrobiodiversity generally) for farmers’ capacity to adapt to increasingly unpredictable and dramatic changes in climate (Burke, Lobell and Guarino 2009; PAR 2010; Fujisaka, Williams and Halewood 2011; Bedmar Villanueva, Halewood and López Noriega 2015; Jarvis et al. 2015). Farmers can use crop diversity, including farmers’ varieties, to decrease the incidence and impact of plant pests and diseases (Zhu et al. 2000; Jarvis et al. 2011; Hajjar, Jarvis and Gemmill-Herren 2008; Mulumba et al. 2012; Tooker and Frank 2012). Farmers’ varieties sometimes outperform formal sector improved varieties, especially when deployed in difficult environments, and in systems where farmers cannot afford inputs that are recommended to boost
the performance of formal sector improved materials (Burdon and Jarosz 1990; Ceccarelli 1996; Balcha and Tanto 2008; Kumemi et al. 2012). They can constitute important sources of nutrition in diversified food systems (Johns and Eyzaguirre 2006; Frison et al. 2011; Powel et al. 2015), and often play an important role in reinforcing cultural identity and continuity (Argumedo and Pimbert 2008; Nabham 2009; Gentilcore 2010).³

Farmers’ varieties do not exist on their own; they are epiphenomena of the farmer-centred innovation systems, which create and continuously maintain them (or alternatively allow them to fall into disuse and disappear). For some crops, in some parts of the world, the entire development chain consisting of diversity conservation, variety enhancement, seed multiplication, exchange and use is entirely farmer-led, without any involvement of formal sector organizations, and entirely unregulated. On the other hand, for many crops, in many parts of the world, farmers’ crop and diversity management cuts across both formal and informal seed systems⁴ (Van der Ploeg 2010), for example, accessing seed of the formal sector improved varieties through local markets or neighbours and mixing those varieties with their own varieties, or contributing their own farmers’ varieties to be used in formal sector research or breeding programs (Louwaars and De Boef 2012). It is estimated that smallholder farmers in developing countries access up to 90 percent of their seed through informal mechanisms, including from their own harvests, from neighbours and local markets (Badstue et al. 2006; Hodgkin et al. 2007; Thomas et al. 2012; Pautasso et al. 2013). In addition, based on data gathered from six countries covering forty crops, McGuire and Sperling (2016) estimate that half of this informally sourced seed is obtained by farmers through local markets. There is a danger that the spread in scope and application of the commercial seed sector supported by favourable policies, including subsidization (and concomitant reduction in public research and plant breeding and extension) will place informal seed systems under increasing pressure, with the result that farmers’ ability to innovate and contribute to development and maintenance of diversity will be lost (De Schutter 2009).

The increased recognition of farmers’ dynamic role in the evolution and conservation of crop diversity, and the utility of that diversity, has been attended by calls for institutional and policy support (Jarvis et al. 2011; Santilli 2011). Recognizing and promoting farmers’ rights to save, use, exchange and sell reproductive material is the most directly linked, and most frequently called for policy support (Robinson 2007; Pelegrina and Salazar 2011; Da Via 2012; Braunschweig et al. 2014). If farmers choose (or are required) to buy seed each season, then on-farm, across farm, and across agroecosystem levels of farmer-managed crop evolution will be interrupted. Promoting farmers’ right to benefit from others’ use of their varieties, for example, by allowing the sale of seeds of their varieties on the open market (Thijssen et al. 2008; Lipper, Anderson and Dalton 2010), or receiving benefits when others use them for research, breeding and further commercialization subject to prior informed consent (Humphries et al. 2012), are some options. Increasing farmers’ access to quality seed of a
wider, more diverse range of varieties – including farmers’ varieties from their own agroecosystems – to introduce, mix and manage on their farms (Jarvis et al. 2011) is also essential. Such access can be increased through a variety of measures to strengthen informal and mixed formal and informal seed systems (Beck 2011; Gill et al. 2013; Kloppenburg 2014). Land tenure security is an important prerequisite for farmers to be willing to invest in diversity management (Dennis et al. 2003; Lapeña, Turtieva and López Noriega 2014), also enhancing access to markets for products of niche crops (Kuntashula et al. 2011; Giuliani et al. 2012). Participatory plant breeding (Halewood et al. 2007; Ceccarelli, Guimarães and Weltziehn 2009; IPES FOOD 2015), variety selection and other forms of research (De Schutter 2009) with mixed teams of farmers and formal sector researchers can result in new and useful crop diversity being developed and deployed in farmers’ fields (Howeler, Lutaladio and Thomas 2013). Recognizing farmers’ autonomy to organize collective actions related to seed exchange, diversity conservation, participatory crop evaluation and improvement – all aspects of what is called community biodiversity management – is also critically important (Argumedo et al. 2011; De la Perrière and Kastler 2011; De Boef et al. 2013; Poudel, Shrestha and Sthapit 2015). Community-led seed enterprises (Afari-Sefa et al. 2013) and community seed banks are gaining increased attention as interventions that can create network linkages between farmers and experts from national gene banks, research organizations and so forth who are interested in conserving, using and evolving crop diversity in farmer-managed innovation systems (Vernooy et al. 2014; Vernooy, Shrestha and Sthapit 2015).

Ultimately, there is a continuum between policies and institutions directly related to development and conservation of farmers’ varieties per se and those that are related to the maintenance and strengthening of the broader systems of farmer-centred innovation to produce and sustain those varieties in the first place. Farmer-centred innovation, community empowerment, biological diversity conservation, sustainable development and food security are interlinked. In the end, the range of matters that need to be addressed cut across property, social, economic, environmental and human rights issues.

The linked challenges addressed in this book

It is beyond the scope of this book to examine the full range of benefits associated with the use of farmers’ varieties and supportive policies mentioned earlier. Instead, the book focuses in on two interlinked questions. The first question is, ‘How do farmer management practices (along with other factors such as environment and the breeding systems of plants) affect the evolution and maintenance of discrete farmers’ varieties?’ The second question is, ‘How can policies that depend on being able to identify discrete plant varieties accommodate the agro-cultural realities associated with the generation, use and maintenance of farmers’ varieties?’

This focus on discreteness is topical because there are no fixed, internationally recognized taxonomic or legal definitions of farmers’ varieties. And that
presents a common challenge to policies that involve making specific farmers’ varieties the object of legal rights or privileges. One such policy is to create *sui generis* intellectual property (IP) laws for farmers’ varieties, to give farmers the means to control others’ use of those varieties. Another policy is to create space for including farmers’ varieties in national variety release lists so they can be sold on the open market. A third closely related policy strategy for promoting (or at least defending) farmers’ interests in their varieties is to defensively publish information about those varieties to prohibit others from making them the subject of intellectual property rights. The purpose of the exercise is to defeat intellectual property applicants’ claims that the variety for which they are claiming protection is not discrete (or new or novel or distinct or nonobvious).

In the past, when confronted with demands to recognize property protection for sexually producing plants, policy makers drew on taxonomists’ criteria for distinguishing and naming cultivars (i.e. distinctness, uniformity and stability) as set out in the International Code of Nomenclature for Cultivated Plants (Sherman 2008; Parry 2012). Those criteria have been adopted by the UPOV Convention (International Convention for the Protection of New Varieties of Plants) establishing minimum standards for plant breeders’ rights, and a number of regional agreements to harmonize seed trade regulations. Farmers’ varieties, however, beg the question that is answered through reference to the International Code, because they frequently do not satisfy the criteria of distinctness, uniformity and stability that it embraces (Halewood et al. 2006). In this way, farmers’ varieties present the next generation of linked taxonomic and policy challenges, at least in the context of developing and implementing policies that make discrete varieties the object of legal rights or privileges. This book attempts to respond, at least in part, to these challenges.

Before continuing, it is important to highlight that most of the policy options described in the preceding subsection are not directly affected by the lack of a taxonomic or legal definition of farmers’ varieties. For example, it is not necessary to be able to identify discrete farmers’ varieties (and distinguish them from other farmers’ varieties), as part of asserting farmers’ rights to save, use, exchange and sell farm-saved seed, or to land tenure security, or to participate in decision making relevant for the conservation and use of these resources. The fact that the book focuses on policy options that make particular varieties the objects of rights or privileges does not mean that we feel that such policies have the most potential to ensure and increase the distribution of benefits to farmers. As already stated, farmers’ right to save, use, exchange and sell farm-saved seed is a sine qua non for their contributions to the ongoing evolution of crop diversity and to enjoy benefits associated with its use. However, because the right to save, use, exchange and sell seed does not turn on the ability to define discrete farmers’ varieties, it does not fit within the main scope of enquiry of this book.

All of these disclaimers aside, ultimately, farmers’ rights in relation to plant genetic resources for food and agriculture will need to be promoted from local to global levels through combinations of policy initiatives. Events in recent years have demonstrated that policy actors around the world are interested in
exploring a range of options, including those which require the ability to identify discrete farmers’ varieties.

**Policy development context**

One would be justified in wondering how it has come to pass that countries are involved in developing such laws that turn on the ability to identify discrete farmers’ varieties when there is still uncertainty, in taxonomy and in law, about the definition of farmers’ varieties. Perhaps the most accurate answer is that these policy initiatives are instances of political good will – often stimulated by civil society and farmers’ organizations – getting ahead of the policy makers’ appreciation of the scientific basis upon which the policies must be made to operate. These are not grounds for indictment. In fact, a lot of policies are developed in this way, with politicians and high-level policy makers – often responding to outside pressures – opening up small spaces for interested actors (including stakeholders and technical specialists) to go off the beaten path to explore, with the possibility that, once more fully investigated, the facts will justify further investment in further policy development and implementation strategies (Lapeña 2012). Indeed, as discussed later and particularly in Chapter 4 of this volume, this process describes the origin and evolution of the concept of farmers’ rights (Mooney 2011). At this stage, what is already clear is that appropriate policies linked to seed and farmers’ varieties are necessary to create an enabling environment for smallholder agriculture, that promote the use of plant genetic resources for food and agriculture and integrate it better in seed sector development (FAO 2015).

This book is meant to be a contribution to this process. The authors are part of a virtual troupe of stakeholders, practitioners and technical experts squeezing through relatively narrow policy space that have been opened up for farmers’ rights, examining practical options for expanding and implementing those rights in meaningful ways that reflect the reality of how farmers conserve, use, exchange and improve their varieties, and how those uses influence the diversity of those varieties. It is our hope that by focusing on the technical issue of ‘what is a farmers’ variety?’ in taxonomy and in law, the book will help policy makers assess their options, taking into account the opinions of stakeholders and experts and lessons learned from initiatives in different countries.

**A brief summary of the relevant policies, laws and related strategies**

**Variety registration**

As part of their national seed regulation, many countries have established a range of conditions that plant varieties must satisfy before they can be included in national variety lists, and the seed of those varieties can be sold on the open market. The objective of these laws is to ensure that seeds sold to farmers are of high quality, and perform in predictable ways. In order to be included on the
national lists of varieties that can be commercialized, varieties must meet the criterion of distinctness, uniformity and stability (DUS), and have demonstrated additional value above other varieties of the same species. European countries were the first to develop such laws, with developing countries following suit. Such regulations were developed with the market for formally bred seed in mind, not seeds of varieties developed and managed by local farmers over generations. The premise behind this book, and behind the widespread use of the term farmers’ varieties, is that farmers’ varieties are often different from varieties developed through the formal plant-breeding sector. And one of the differences is that they frequently are not as distinct, uniform and stable as the varieties arising from the formal breeding sector. As a result, farmers’ varieties – particularly those of open-pollinated species – do not satisfy these registration requirements, and therefore cannot be legally sold in the country, even if they have demonstrated commercial potential (Munyi and De Jonge 2015).

There are a number of possible ways to attempt to address this problem. One relatively indirect way is to exempt exchanges and sales of farm-saved seed between smallholder farmers from the scope of national variety registration and release regulations. Ethiopia, for example, includes such an exemption in its national seed regulations. This opens up some limited space for commercialization of farmers’ varieties, for sales between farmers, but not on a larger scale, with companies taking an active role. Another more direct way would be to exempt farmers’ varieties entirely from mandatory registration requirements as a precondition for commercialization. This possibility is built into national seed regulations that are completely voluntary, such as in the United States. However, as far as the authors are aware, no countries that have adopted seed laws that include mandatory variety registration have created a wholesale exemption for farmers’ varieties.

Another option that an increasing number of countries (and at least one region) are experimenting with is to adapt variety registration regulations and practices, to make them more flexible, with different criteria for registration, reflecting the special nature of farmers’ varieties (IFOAM 2004; FAO 2006; Paavilainen 2009; Lapeña 2012; Mahop, De Jonge and Munyi 2013b). Some of the countries that have created alternative registration lists with alternative registration criteria for farmers’ varieties (or for categories of varieties that would at least partially include what we are calling farmers’ varieties in this publication) are Peru, France, Italy, the Netherlands, Costa Rica, Benin, Nepal, Finland, Switzerland, Republic of Korea and Ecuador. A number of these national regulations are examined in this book.

It makes sense that introduction of revised registration options for farmers’ varieties would be accompanied by rules allowing farmers, and farmers’ organizations, to register varieties in their own names. In some countries, registrants must be companies, or organizations with at least one formally trained breeder; other countries have revised their regulations to address this issue (e.g. Nepal and Ecuador). In Ecuador, this reform – brought about by decree in 2012 – is already considered quite successful in terms of its outreach to farmers and farmers’ organizations.
Most countries’ seed regulations establish criteria for regulating and registering seed multipliers, to ensure that seed is grown under conditions that promote its genetic integrity and health. Often, the farmers and farming communities that have played key roles in the development and maintenance of farmers’ varieties are unable to meet those criteria. The result is that, in the event that a farmers’ variety is registered, other organizations — perhaps without substantial connection to the farmers concerned — would need to take responsibility for the maintenance of the variety and multiplication and marketing of the seed. Ultimately, this creates another layer of disincentive for farmers, farming communities and research and civil society organizations that may be assisting them to pursue farmer variety registration.

In 1993, the Food and Agriculture Organization of the UN (FAO) introduced the concept of ‘quality declared seed’ (QDS) to respond to the combined facts that (1) many countries did not have the capacity to implement and enforce full-scale, centralized seed quality control regulations, (2) there are already a range of potential seed multipliers/distributers who can provide and are providing seed through unregulated, informal systems, and (3) less ambitious, more incremental improvements to those seed systems were possible (FAO 1993, 2006). In principle, the QDS system is not meant to compete or enter into conflict with more stringent seed regulations. It was designed for use in countries, and for crops, where the formal seed sector (including highly demanding seed quality standards and regulations) has not expanded in scope (Bishaw and Louwaars 2014). Zambia’s Plant Varieties and Seeds Act,¹³ for example, has a two-tiered system of standards to promote seed quality: one with stricter standards conforming to the standard model described earlier, including DUS as preconditions for variety registration, and a second tier that establishes a QDS system. QDS involves a centralized system of registering varieties for which QDS can be produced and marketed, a centralized system or producer registration, and checks by national authorities of seed multiplication cropping and seed prepared for sale. FAO’s QDS guidelines established three kinds of varieties that can be registered: bred varieties, local varieties and varieties developed through participatory plant breeding. For a local variety, an applicant for registration must submit its name, its origin, a simple morphological description and its value for cultivation and use, with an indication of the agroecological zone for which the variety is suited, and information about the procedures to be followed for maintaining the variety (FAO 2006). This system potentially has flexibility for registration of farmers’ varieties, and commercial sale of quality declared seed of those varieties. It also has flexibility to empower smaller organizations — like farmers’ organizations (or consortia of organizations that include farmer organizations) — to produce and trade in farmers’ variety seeds. A number of countries have included QDS as part of their seed regulation, including Tanzania, Peru, Ecuador, Rwanda, Ethiopia and Zambia.

In an effort to increase the size of seed markets through cross-border trade, some regions have developed (or are developing) agreements to harmonize
their seed laws and variety registration and seed certification requirements (Rohrbach, Minde and Howard 2003). As part of these agreements, member countries agree to recognize varieties that are registered in other member countries, thereby reducing transaction costs associated with regulatory compliance for companies that want to sell their seeds in more than one country. Harmonization may ultimately contribute to farmers’ getting faster access to quality seed of new varieties (Gisselquist 2013, Setimela et al. 2009) produced through formal sector mechanisms, even in countries with small seed markets.

Most of these regional harmonization agreements, however, reproduce the standard DUS and VCU (value for cultivation and use) conditions for registration, thereby further entrenching and expanding the scope of rules that do nothing to address the special situation of farmers’ varieties. For example, the Economic Community of West African States (ECOWAS) adopted harmonization regulations in 2008, which included the creation of the West African Catalogue of Plant Species and Varieties. This regional catalogue is comprised of the national catalogues of each member state. The rules specify that to be included in a national list of varieties that can be sold within the region, varieties must be DUS with demonstrated VCU (FAO 2008). Likewise, the Common Market for Eastern and Southern Africa (COMESA) Seed Trade Harmonization Regulations, 2014 establishes a catalogue of all varieties that can be commercialized within the East and Southern Africa subregion, requiring that they be distinct, uniform and stable, with demonstrable VCU. The Memorandum of Understanding for the harmonization of seed regulations in the Southern African Development Community (SADC) came into force in 2013; it also includes DUS and VCU as criteria for inclusion in a regional catalogue. All three regional seed law harmonization initiatives have been subject to considerable criticism by civil society organizations on these grounds (GRAIN 2005; ACB 2012; AFSA 2013). Some of these harmonization rules leave room for the maintenance of looser standards and alternative registration lists for varieties whose seeds will only be marketed within the country concerned.

The European Common Catalogue, established in 1972, also includes the DUS criteria. However, in 2008 and 2009 EU directives created exceptions for the registration and limited sales of ‘conservation varieties’, defined as those landraces and varieties that have been traditionally grown in particular localities and regions and are threatened by genetic erosion, which were not held to the same DUS standards. While an important step forward in principle, this approach has nonetheless been the subject of considerable criticism for the limitations it places on farmers and farmers’ varieties. The European derogation and more recent attempts to introduce new legislation are addressed in later chapters in this book. It is not clear why other regions’ seed law harmonization efforts are not actively exploring registration criteria exceptions for farmers’ varieties that build (and expand) upon the EU treatment of conservation varieties.
Clusters of questions that this book explores are: What was the rational and historical evolution of mandatory variety registration as a precondition for commercialization? Why were the DUS criteria in particular adopted? What variations of registration criteria are some countries or regions experimenting with? In countries that have developed alternative systems, who is allowed to actually register farmers’ varieties? Who is driving the process of considering policy alternatives in national settings, and what challenges have they encountered?

Ultimately, policy makers will need to feel comfortable that suggested modifications to the ‘default’ systems of DUS variety registration are balanced with competing policy goals, that is that consumer safety is adequately promoted while simultaneously promoting farmer innovation, income generation, and genetic diversity conservation. One possibility is that the balance should be struck differently in different situations, taking into consideration the state of the markets and competition between suppliers of the crops in question, the institutional capacity of the country concerned to implement and enforce such a policy and so on. Here, we are optimistic about the possibility of national laws being able to accommodate the kinds of changes that are necessary to allow the inclusion of farmers’ varieties in national lists, as long as they are complemented by other measures to ensure farmers-as-seed-buyers are not exposed to too much risk when purchasing seed on the open market. In some countries and for some crops (depending upon their breeding system), the market operates relatively well in this regard. Where this is not so, other measures have to be built in to minimize consumers’ risk.

**Sui generis plant variety protection**

An increasing number of countries have developed plant variety protection laws that allow owners of plant varieties to exclude others’ use of those varieties for a number of proscribed purposes, including production, multiplication, conditioning for the purpose of propagation, selling, importing, exporting or stocking for any of the purposes mentioned. The objective of such laws is to create incentives for breeders to engage in innovative plant breeding activities, by providing them a time-limited exclusive right to commercially exploit their varieties. Most countries’ plant variety protection laws stipulate that varieties must be novel, distinct, uniform and stable to qualify for intellectual property protection (Kanniah and Antons 2012; Koonan 2014; Lertdhamtewe 2014). The reappearance of DUS in this context is not a coincidence. Variety registration in national seed laws and plant variety protection laws both adopted criteria and practices from taxonomists for identifying and naming cultivars (Sherman 2008; Parry 2012). Problems related to the reliance on these criteria in plant variety protection laws chart very closely those problems associated with their use in variety commercialization regulations. If farmers’ varieties don’t satisfy these criteria, then they can’t be the subject of plant variety protection laws,
and farmers are thereby precluded from the possibility of exploiting would-be exclusive rights over the use of the varieties they develop and maintain (Bishaw and Van Gastel 2009, p. 582 in relation to the protection of PPB varieties; Mahop, De Jonge and Munyi 2013a; De Jonge 2014).

One possible solution, to potentially provide farmers with increased benefits derived from others’ use of their varieties would, again, be to alter the DUS criteria for protection so the more heterogeneous farmers’ varieties could be recognized and protected (Leskien and Flitner 1997; IPGRI 1999; Crucible II Group 2000; Robinson 2007; Koonan 2014; ISSD 2015). Some countries have experimented with introducing alternative conditions for protecting farmers’ varieties. Malaysia was one of the earliest countries to attempt to do this; its plant variety protection (PVP) law establishes that farmers’ varieties can be protected if they are novel, distinct and identifiable. India and Thailand have dropped the novelty requirement for certain classes of varieties to qualify for forms of intellectual property protection. India has also passed a regulation in furtherance of the implementation of the 2001 Protection of Plant Varieties and Farmers’ Rights (PPV&FR) Act, which specifies that, for farmers’ varieties, uniformity standards could be relaxed to allow double the number of off-types as otherwise permitted for registration of other categories of varieties under that Act. There are still relatively few examples of laws including alternative (or formally relaxed) criteria for farmers’ varieties, and the few that do exist have not yet established proven track records, with the numbers of protected farmers’ varieties remaining very low.

Directly related issues concern the impact of such policies on the very farmers they are meant to reward and incentivize. Farmers have been innovating through selection, exchange, and experimentation for millennia in largely informal, unregulated systems. Presumably they have been engaged for millennia in the innovative behaviours that have given rise to the crop variety diversity that already exists. There is the possibility that layering on a new set of incentives would encourage farmers to act in ways that would counteract their diversity-creating behaviours. There is also the very real possibility that individual private property rights are culturally at odds, and therefore inappropriate, with more open systems of farmer innovation and shared interests in farmers’ varieties (Correa 2000; Robinson 2007).

Some recent national policy initiatives involve an amalgam of intellectual property rights and the kind of rights that are created by ABS (access and benefit sharing) laws. For example, under the Indian PPV&FR Act, parties seeking intellectual property protection for new varieties that incorporate registered farmers’ varieties need to prove that they have obtained consent from the registrees as one of the conditions precedent for the grant of the right. Indonesia’s Plant Variety Protection law, 2000, also provides for the registration of local varieties (by public officials on behalf of local people); anyone who wants to use registered varieties must then negotiate an agreement with the local authorities (Kanniah and Antons 2012).

Efforts to promote harmonized plant variety protection at regional and global scales have reinforced countries’ adoption of novelty, distinctness, uniformity and stability (NDUS) as the standards for national plant variety
protection laws. The number of countries joining the International Union for the Protection of Plant Varieties (UPOV) and implementing plant variety protection laws incorporating NDUS has increased considerably in recent years. UPOV had 72 member states as of 10 June 2014. While the WTO TRIPS agreement does not actually require countries to implement UPOV (Leskien and Flitner 1997), it appears to have provided countries with motivation to do so. So too have bilateral trade agreements, which require the implementation of UPOV compliance standards (Robinson 2007; De Schutter 2009). Through regional agreements like the Organisation Africaine de la Propriété Intellectuelle (OAPI) revised Bangui Agreement (Annex X), the African Regional Intellectual Property Organization (ARIPO) 2015 Arusha Protocol for the Protection of New Varieties of Plants, and the 2012 version of the Draft Protocol for the Protection of New Varieties of Plants (Plant Breeders’ Rights) in the Southern African Development Community Region, entire subregions have committed themselves to reproducing the same standards. These initiatives have also been subject to considerable criticism from civil society (Berne Declaration 2014; AFSA and GRAIN 2015) and academics (Mahop et al. 2013a), who indicate that such standards are inappropriate for developing countries, and suggest ways of implementing them that take advantage of whatever flexibilities exist (De Jonge, Louwaars and Kinderlerer 2015; De Jonge and Munyi 2015).

This book examines a cluster of questions regarding the inclusion of NDUS criteria in national plant variety protection laws that are very similar to those which it examines concerning seed laws. What is the origin of these criteria in plant variety protection laws? What variations are countries (and commentators) considering? What actors are involved in promoting the exploration of alternatives, and what factors – institutional and otherwise – are challenging their implementation?

**Prohibiting third parties’ claims of control over farmers’ varieties**

The corollary of seeking intellectual property rights over farmers’ varieties is seeking to prohibit others from doing so, with the result that they remain in the public domain. One way to do this is to attempt to defeat others’ claims that the varieties over which they seek intellectual property protection are either distinct (in the case of plant variety protection) or novel and nonobvious (in the case of patents). In recent years, there have been a number of cases wherein patents and plant variety protection (PVP) claims over traditional crop varieties (or traditional uses of plants) have been attacked or defeated on these grounds (Comisión Nacional Contra la Biopiratería 2014).

Building on these cases, this book also investigates what kinds of information, in what form, can potentially be used to defeat intellectual property claims, and how that information can be systematically assembled to provide a basis for fending off such claims in the future. In this context, it will consider a range of initiatives to document or register biological diversity (including farmers’ varieties) and traditional knowledge and the extent to which they do or can provide a basis for defensive publication.
Farmers’ rights

Everything discussed earlier, and in this book generally, is situated within the larger political context of promoting farmers’ rights in relation to plant genetic resources for food and agriculture. The concept of farmers’ rights was first introduced in the context of a formal intergovernmental meeting27 in 1985, by a Mexican delegate during a hotly contested session of the FAO’s Commission on Plant Genetic Resources (Bjørnstad 2004; Mooney 2011).

The concept of farmers’ rights – fuzzy though it was – gained a foothold over time. It was included in a resolution adopted by the FAO Council related to the nonbinding International Undertaking on Plant Genetic Resources.28 The idea, simply stated, was that farmers’ contributions to the creation and conservation of biological diversity should be rewarded through newly legal and or political rights, called farmers’ rights, with financial support for continued stewardship of crop diversity. International political negotiations regarding the content of farmers’ rights reached their zenith (or nadir, depending on your perspective) (Egziabher, Matos and Mwila 2011) at 3 a.m. on 3 November 2001, when exhausted negotiators from 116 countries agreed to the text of Article 9 of the International Treaty on Plant Genetic Resources for Food and Agriculture (the ‘Treaty’).

Article 9 states:

9.1 The Contracting Parties recognize the enormous contribution that the local and indigenous communities and farmers of all regions of the world, particularly those in the centres of origin and crop diversity, have made and will continue to make for the conservation and development of plant genetic resources which constitute the basis of food and agriculture production throughout the world.

9.2 The Contracting Parties agree that the responsibility for realizing Farmers’ Rights, as they relate to plant genetic resources for food and agriculture, rests with national governments. In accordance with their needs and priorities, each Contracting Party should, as appropriate, and subject to its national legislation, take measures to protect and promote Farmers’ Rights, including:

a. protection of traditional knowledge relevant to plant genetic resources for food and agriculture;

b. the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture; and

c. the right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture.

9.3 Nothing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material, subject to national law and as appropriate.29
While the inclusion of farmers’ rights in the Treaty is certainly important, the Treaty leaves a lot undone in terms of spelling out the content of farmers’ rights and how they should be implemented. Very significantly (and this is one of the sorest points for people who had hoped for more), the Treaty leaves these issues to be sorted out by national governments (Egziabher et al. 2011; South Centre 2015). With nowhere to turn for precedents, national policy makers and farmers are struggling to find creative, practical measures to promote the interests of farmers in ways that are connected to their role as conservers and promoters of plant genetic diversity.

The whole range of policies mentioned in the introductory paragraphs of this chapter – including the narrower subset of those policies focused on in this book – can be fairly characterized as potential ways to promote farmers’ rights. The inclusion of farmers’ rights in the Treaty provides incentives and momentum within countries for exploring such options. So far, the Governing Body of the Treaty (comprised of 136 countries as of November 2015) has not had many opportunities to focus much attention on the implementation of Article 9. Over the coming years, the Governing Body will function as a de facto clearing house for collection and dissemination concerning domestic policies, laws and administrative procedures to promote farmers’ rights. Consequently, this book should also have an international audience, in addition to be immediately of interest (we hope) to national policy makers and advocates.

The logic and structure of this book

Part 1 of the book provides a technical basis for the analysis that follows. Chapters 2 and 3 address the combined genetic, environmental and human cultural complexities involved in answering the questions, ‘What is a farmers’ variety?’ and ‘How can you tell them apart?’ Jeremy Cherfas (Chapter 2) takes readers through a range of interdependent variables that affect how farmers’ varieties evolve, and when they may (or may not) develop distinctive traits. Carlo Fadda (Chapter 3) focuses in particular on how farmers’ choices affect the evolution and maintenance of certain traits. Since most people reading this book probably are not scientists, we have provided extra space for the explanation of key scientific concepts.

The case studies in Part 2 are designed to provide readers with an appreciation of the kinds of situations in which farmers and their research and development partners come face-to-face with the kinds of policy challenges that this book addresses. The three studies (presented in Chapters 4, 5 and 6), focus on farmer variety enhancement efforts in Nepal, Vietnam and Syria, and the ways in which those efforts were helped or hindered by national policies and laws. The authors are Pratap Shrestha, Nguyen Thi Ngoc Hue, Devra Jarvis and Michael Halewood, and Salvatore Ceccarelli, respectively.

Part 3 of the book situates the concept of farmers’ rights in relation to plant genetic resources for food and agriculture in a broader international policy landscape. In Chapter 7, Regine Andersen analyzes the birth and development of international policies and organizations which are concerned with
the conservation and use of plant genetic resources for food and agriculture in general. In Chapter 8, she narrows her focus on the concept of farmers’ rights, as it has appeared and evolved at the international level, and where it has ‘found legs’ in national policies and practices.

It is in Part 4 that the book gets into the history, rationale, and criticisms of seed and plant variety protection laws, defensive publication strategies, and consideration of institutional capacities. Chapter 9 provides a historical account of the evolution of plant variety protection laws. Carlos Correa provides an analysis of the kinds of discussions that have permeated, for years, public debate about developing *sui generis* versions of PVP laws for farmers’ varieties, for and against, and he considers the last 30 years of countries implementing, or planning to implement, such laws. In keeping with the theme of the book, the author dedicates considerable attention to the DUS standards and the possibilities of different standards being relied upon in *sui generis* approaches.

Chapter 10, by Niels Louwaars and François Burgaud, provides an historical account of the development of variety registration policies and standards, at both the national and more recently the regional levels. They examine the manner in which those laws, first created in developed countries, have been duplicated without much adaptation in developing countries. They examine the policy rationale for potential differences that can be structured into the design in variety registration standards and associated rights and privileges. It devotes considerable attention to the ‘historicity’ of the inclusion and implementation of DUS standards. And it looks to those exceptional cases where some deviation of those standards has been used, such as, for example, in the recently adopted European derogation.

In Chapter 11, Isabel López Noriega considers options for defensive publication in light of the evolution of plant variety protection and patent law, and actual cases wherein interested parties have succeeded or failed to defeat intellectual property claims over farmers’ varieties, or traditional uses of plants, on the basis of existing prior art. She considers a range of biodiversity traditional knowledge registration projects with an eye to both understanding their primary objectives (which often have little or nothing to do with intellectual property concerns), and the extent to which the kinds of information documented could be useful in defeating intellectual property rights claims. Ultimately, she identifies kinds of information, and ways in which it can be shared, that can potentially be used as a basis for systematically collecting and publishing information to defeat intellectual property claims.

Much of the writing to date on developing *sui generis* intellectual property rights regimes, adapting variety registration requirements and promoting defensive publication schemes has paid little attention to challenges associated with the institutional capacity of countries to effectively implement them. In Chapter 12, C.S. Srinivasan analyzes the different kinds of institutional challenges that developing countries in particular face in implementing these three approaches to promoting farmers’ rights.

Part 5 includes a number of country case studies focusing on district or national level policy initiatives related to variety registration and intellectual property
laws, with a view to how those initiatives address (or don’t address) the special situation of farmers’ varieties. Part 5 also includes case studies concerning how governments have proactively developed means to defensively publish information about farmers’ varieties. In each case, the author(s) describe the content of the law or policy in question and provide some context relating to the actors who promoted its development, whether or not it was successfully adopted, and its current state of implementation. Many of these case studies are cross-referenced in Part 4, so some readers will likely flip ahead to read the case study while they are reading the chapter addressing the same subject matter in Part 4.


The second group of case studies concerns seed laws and variety registration. Pratap Shrestha writes about the Nepalese seed law and changes to implementation guidelines to accommodate farmers’ varieties. The US regulatory approach, which does not include mandatory variety registration as a precondition for commercialization, is introduced by Richard Blaustein. Juliana Santilli provides a commentary on the Brazilian seed law with a particular focus on its treatment of creole varieties. Alejandro Mejias, Enrico Bertacchini and Riccardo Bocci describe the range of approaches that Italian provinces have taken to developing alternative lists of crop varieties, as part of regionalized efforts to promote conservation and sustainable use of local diversity. Godfrey Mwila describes the Zambian seed law and the manner in which it incorporates the concept of quality declared seed. Nguyen Van Dinh and Nguyen Ngoc Kinh highlight relevant aspects of Vietnam’s Regulation on Production Management of Farm Households’ Plant Varieties, 2008. Manuel Ruiz Muller analyzes Peru’s initiative to create a registry for native crop varieties under Law No. 28477. Jorge Cabrera Medaglia comments on ongoing efforts to develop a draft seed law in Costa Rica that will – if successful – create space for the registration and commercialization of farmers’ varieties. Finally, Raymond Vodouhe and Michael Halewood write about the conditions for registering farmers’ varieties in the Benin seed law.

Notes
1 The authors thank Juanita Chaves and Bram De Jonge for their comments on earlier drafts of this chapter.
Other related factors that contribute to the extent to which plant populations evolve, or don’t, in farmer-managed systems of crop innovation include the breeding systems of the plants themselves, the variability of the environmental conditions where farmers are planting, the reliability and geographic range of seed exchange systems, the kinds of new materials that are available to farmers to introduce, and demands for the harvested products from those varieties (Halewood et al. 2006; Cox 2009; Döring et al. 2011).

The importance of some crops to national cultural identity is reflected in the 2014 Costa Rica Decree No. 38.538/C/MAG, which declares its diversity of maize varieties and uses as cultural patrimony of Costa Rica, and in Guatemala Legislative Decree No. 13–2014 which states that maize forms part of the intangible cultural heritage of the nation and creates August 13 as the ‘National Day of Maize’, and in Peru Supreme Resolution No. 009-2005-AG that declares May 30 as the ‘National Day of Potato’ to recognise the country as the centre of origin and diversity of the potato, with high concentration of native potatoes and wild relatives diversity.

Formal seed supply systems are characterised by a vertically organised production and distribution of tested seed and approved varieties, while informal, local or traditional seed systems are referred to local reproduction of the seed by farmers themselves, using ‘local’ seed selection, production and conditioning practices (Almekinders, Louwaars and de Bruijn 1994).


Seed Proclamation No. 782/2013 exempts ‘the exchange or sale of farm-saved seed among smallholder farmers or agro-pastoralists’ from the coverage of the Proclamation, thereby allowing farmers to sell and exchange materials, among themselves, without first satisfying variety registration, and seed producer and distributor standards. Of course, this exemption also creates space for farmers to exchange and sell seed of registered varieties as well (amongst themselves).

The relevant laws of Peru, France, Italy, the Netherlands, Costa Rica, Benin and Nepal are examined in Chapters 10, 18, 21, 24, 25 and 26 of this volume.


Ordonnance du Département fédéral de l’économie, de la formation et de la recherche (DEFR) sur les semences et plants du 7 décembre 1998 (Etat le 1er janvier 2013).


Acuerdo No. 494 Normativa para la Aplicación de la Ley de Semillas, 30 November 2012.

Ibid.


COMESA Seed Trade Harmonization Regulations, 2014, adopted by the COMESA Council, at its 32nd meeting held at Kinshasa, Democratic Republic of Congo, available at http://foodtradeesa.com/wp-content/uploads/2013/06/COMESA-Seed-Harmonisation-Regulations.pdf (last accessed 29 May 2015). A distinction between the ECO-WAS and COMESA regulation may be possible on the basis that the latter (at paragraphs 26, 27 and 28) appears to set standards only for varieties to be marketed on the regional basis, and not for registration and marketing strictly within the borders of member states.


Commission Directive 2008/62/EC of 20 June 2008 providing for certain derogations for acceptance of agricultural landraces and varieties which are naturally adapted
to the local and regional conditions and threatened by genetic erosion and for marketing of seed and seed potatoes of those landraces and varieties; Commission Directive 2009/145/EC of 26 November 2009 providing for certain derogations, for acceptance of vegetable landraces and varieties which have been traditionally grown in particular localities and regions and are threatened by genetic erosion and of vegetable varieties with no intrinsic value for commercial crop production but developed for growing under particular conditions and for marketing of seed of those landraces and varieties.

24 OAPI joined UPOV on 10 June 2014. The 1977 Bangui Agreement was revised in 1999 to align with UPOV 1991 and entered into force in 2006.
27 Mooney (2011), Santilli (2011) and Anderson (2005) note that the term “farmers’ rights” was first coined in the 1980s by a nongovernmental organization – Rural Advancement Foundation International (RAFI), more recently renamed Erosion, Technology and Control (ETC) – that was active monitoring genetic resources issues being addressed under the aegis of FAO.
28 Resolution 5/89 (Adopted 29 November 1989),

   Endorses the concept of Farmers’ Rights (Farmers’ Rights mean rights arising from the past, present and future contributions of farmers in conserving, improving, and making available plant genetic resources, particularly those in the International Community, as trustee for present and future generations of farmers, for the purpose of ensuring full benefits to farmers, and supporting the continuation of their contributions, as well as the attainment of the overall purposes of the International Undertaking) in order to:

   a ensure that the need for conservation is globally recognized and that sufficient funds for these purposes will be available;
   b assist farmers and farming communities, in all regions of the world, but especially in the areas of origin/diversity of plant genetic resources, in the protection and conservation of their plant genetic resources, and of the natural biosphere;
allow farmers, their communities, and countries in all regions, to participate fully in the benefits derived, at present and in the future, from the improved use of plant genetic resources, through plant breeding and other scientific methods.


References


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