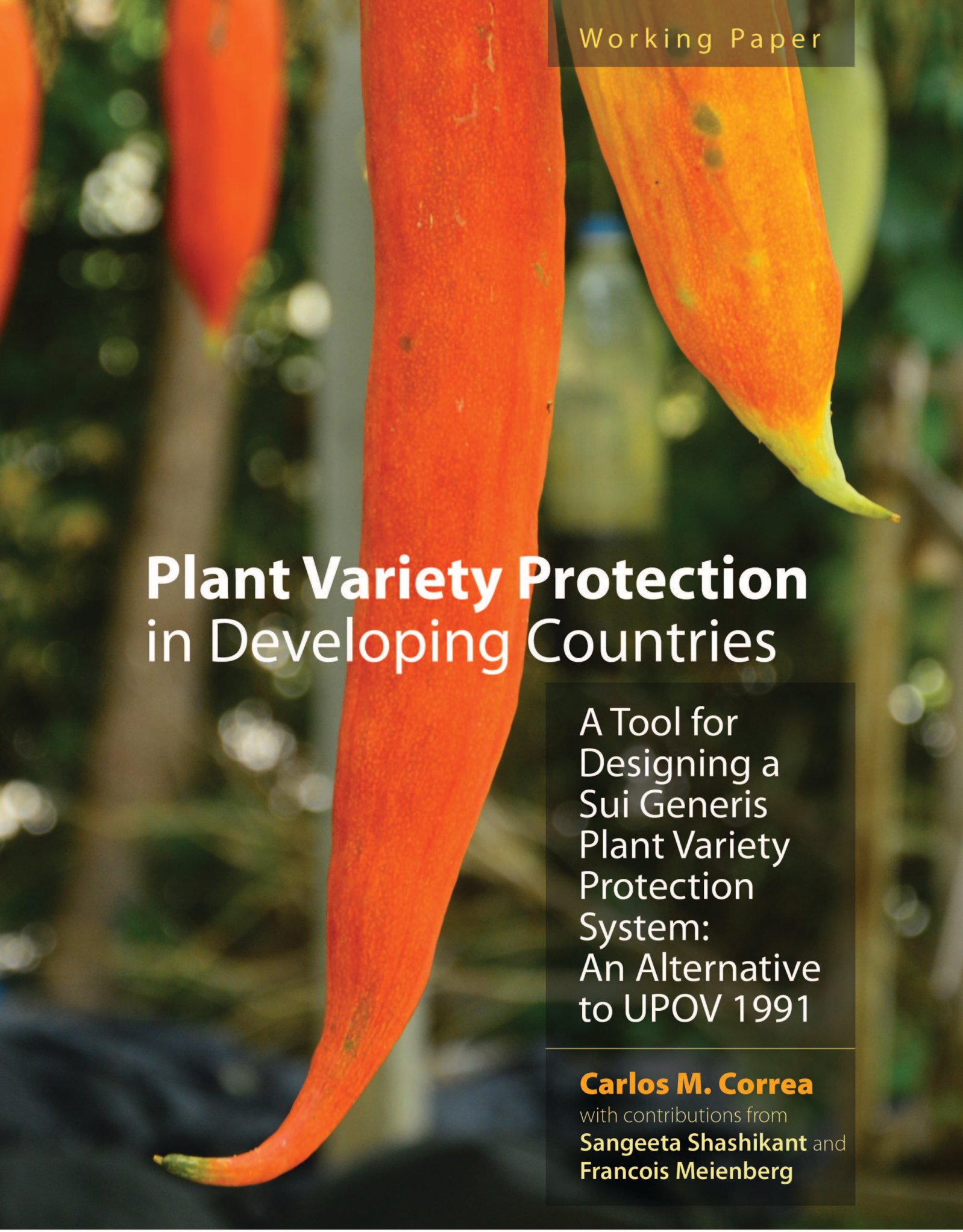

Working Paper

Plant Variety Protection in Developing Countries

A Tool for Designing a Sui Generis Plant Variety Protection System: An Alternative to UPOV 1991

Carlos M. Correa
with contributions from
Sangeeta Shashikant and
Francois Meienberg

APBREBES
BD Berne Declaration · Déclaration de Berne · Erklärung von Bern
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CONTENTS

LIST OF ABBREVIATIONS

ACP	African, Caribbean and Pacific (Group of States)
AIPH	International Association of Horticultural Producers
AIPPI	Association Internationale pour la Protection de la Propriété Intellectuelle
APBREBES	Association for Plant Breeding for the Benefit of Society
ASSINSEL	International Association of Plant Breeders for the Protection of Plant Varieties
ASTA	American Seed Trade Association
CAFTA	US-Central America Free Trade Agreement
CBD	Convention on Biological Diversity
CPVO	Community Plant Variety Office (EU)
DUS	distinctness, uniformity and stability
EDV	essentially derived variety
EFTA	European Free Trade Association
FAO	(UN) Food and Agriculture Organization
FDI	foreign direct investment
FTA	free trade agreement
GRs	genetic resources
IFAD	International Fund for Agricultural Development
IGC	(WIPO) Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore
IP	intellectual property
IPRs	intellectual property rights
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
LDC	least developed country
MAS	marker-assisted selection
NDUS	novelty, distinctness, uniformity and stability
NGO	non-governmental organization
OAPI	African Intellectual Property Organization
PBAK	Plant Breeders' Association of Kenya
PBRs	plant breeders' rights
PGRFA	plant genetic resources for food and agriculture
PIC	prior informed consent
PPVFR	Protection of Plant Varieties and Farmers' Rights (Act) (India)
PVP	plant variety protection
PVPA	Plant Variety Protection Act (USA)
PVR	plant variety rights
SPVA	Seeds and Plant Varieties Act (Kenya)
STAK	Seed Trader Association of Kenya
TCEs	traditional cultural expressions
TK	traditional knowledge
TRIPS	(Agreement on) Trade-Related Aspects of Intellectual Property Rights
UNEP	United Nations Environment Programme
UPOV	International Union for the Protection of New Varieties of Plants
UPOV 1991	1991 Act of the International Convention for the Protection of New Varieties of Plants
USDA	United States Department of Agriculture
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

ABOUT THIS WORKING PAPER

THIS working paper is a tool to assist developing countries in designing a sui generis plant variety protection (PVP) system that is consistent with the requirements of the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), is suitable for the seed and agricultural systems that prevail in developing countries, and promotes achievement of the objectives of the Convention on Biological Diversity (CBD), the Nagoya Protocol on Access and Benefit Sharing (Nagoya Protocol) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). This tool could also support civil society and farmer organizations engaged in seed policy work and advocating for an appropriate sui generis system.

WTO member states (with the exception of least developed countries) are required to make available some form of intellectual property protection for plant varieties. However, they have the flexibility to design a 'sui generis' (unique) system for such protection. There is extensive literature on the inappropriateness of the 1991 Act of the International Convention for the Protection of New Varieties of Plants (UPOV 1991) for developing countries where farmer-managed seed systems (also commonly known as the informal seed sector) and the practices of saving, using, exchanging and selling seeds are prevalent. UPOV 1991 requirements also undermine implementation of the CBD, Nagoya Protocol and the ITPGRFA.

Thus the rationale for this tool is to present an alternative to UPOV 1991 taking into account the realities and conditions as well as alternative sui generis PVP systems that exist in some developing countries.

It has been observed by the publishing organizations of this working paper that governments intending to legislate on PVP often receive assistance from UPOV and are unaware of the significant concerns with regard to UPOV 1991, the flexibilities provided under the TRIPS Agreement, obligations under other international treaties such as the CBD, Nagoya Protocol and the ITPGRFA and the possible legal options available to them. In short, these governments are constrained by limited expertise, institutional capacity and experience in designing regimes appropriate to the conditions prevailing in their countries. Hence, this tool is an attempt to fill that knowledge gap, and to enable developing-country governments to explore alternative legal options for developing a relevant PVP system and to take an informed decision.

Chapter 1 of this paper examines the origins of plant protection through intellectual property rights and UPOV. Chapter 2 elaborates on the requirements of the TRIPS Agreement and the flexibilities available to WTO members as well as the context and provisions of other international instruments (currently the CBD, Nagoya Protocol and the ITPGRFA) relevant to plant genetic resources. Chapter 3 discusses the key features of UPOV 1991 and its implications for developing countries.

Chapter 4 proposes model provisions for key features that are essential to designing a sui generis PVP regime and which may be adapted to national circumstances. Chapter 5 addresses the obstacles that developing countries may face in designing sui generis PVP legislation, arguments against and in favour of non-UPOV-type sui generis regimes, and recommendations for actions to be taken when developing a PVP law.

This working paper is the outcome of a project undertaken by the Association for Plant Breeding for the Benefit of Society (APBREBES). An advisory group was formed to assist in the development of the paper. The advisory group consists of: Bram de Jonge (Wageningen University), Francois Meienberg (Berne Declaration), Gurdial Singh Nijar (University of Malaya), Mariam Mayet (African Centre for Biodiversity), Normita Ignacio (SEARICE), Sangeeta Shashikant (Third World Network) and Susanne Gura (APBREBES).

This working paper is the result of:

- a review of existing literature on PVP systems and UPOV and other relevant instruments (CBD, Nagoya Protocol and ITPGRFA) as well as PVP legislations in operation in various countries particularly developing countries

- advisory group meetings to discuss the conceptualization and drafts of the working paper. Meetings were held on: March 28-29, 2014 in Cape Town; August 26-28, 2014 in Zurich; and February 16-17, 2015 in Frankfurt.
- consultations with Bert Visser (Director, Centre for Genetic Resources, Netherlands) and others to obtain feedback on a draft of the working paper, particularly the model provisions presented in Chapter 4
- comments provided by members of the advisory group on the various drafts of the working paper
- comments received from Lim Li Ching, Third World Network; Guy Kastler, La Via Campesina (European Coordination); Teshome Hunduma, Norwegian Development Fund; Lim Eng Siang, Malaysian representative at the Ad Hoc Open-ended Working Group to Enhance the Functioning of the Multilateral System of Access and Benefit-sharing; Edward Hammond, Prickly Research; and Dr. Yiching Song, Center for Chinese Agricultural Policy, Chinese Academy of Sciences.

APBREBES welcomes feedback and comments on this document. These can be forwarded to: contact@apbrebes.org

EXECUTIVE SUMMARY

PRIVATE nurseries and breeders from the United States pioneered the legislative movement towards the creation of exclusive rights over plant varieties. They were able to obtain, without the participation of farmers and consumers, the enactment of special legal regimes of plant variety protection (PVP). In Europe, commercial breeders' initiatives led to the adoption of the International Convention for the Protection of New Varieties of Plants (UPOV), conceived for the agricultural systems and the modalities of seed production prevailing in those countries. Developing countries were conspicuously absent in the process of creation and strengthening, through UPOV as revised in 1991 (UPOV 1991), of this international regime.

As a matter of principle, countries should be able to choose whether or not to provide intellectual property protection to plant varieties as well as what form of intellectual property protection they confer, depending on the characteristics of their agriculture and seed supply systems. Improvements in plant genetic resources for food and agriculture have taken place over the centuries without such protection. The costs generated by such protection may exceed potential benefits, particularly if farmers are prevented from pursuing their traditional practices of saving, using, exchanging and selling seeds/propagating material.

World Trade Organization (WTO) member states bound by the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) need to provide some form of intellectual property protection for plant varieties. This obligation is crafted in such a manner that significant flexibility exists to design the legal regime for such protection. Importantly, least developed countries (LDCs), even if members of the WTO, enjoy full policy space to not provide any intellectual property protection for plant varieties.

Some countries have opted for joining UPOV 1991 in order to comply with the obligation created by the TRIPS Agreement; many of these countries have done so in response to pressures from developed countries or obligations imposed in free trade agreements (FTAs). However, UPOV 1991 – which significantly expanded and strengthened plant breeders' rights – offers a rigid model inappropriate for developing countries. It ignores the characteristics of the seed supply systems in those countries, where farmers produce a large part of the seeds/propagating material used, and suppresses farmers' traditional practices of saving, exchanging and selling plant materials. In developing countries access to seeds/propagating material is heavily dependent on practices of saving and exchanging seeds/propagating material. Selling of seeds/propagating material is an important source of income for farmers and their families. These activities are crucial to preserving a diversified supply of seeds, adapted to local conditions and a changing environment. UPOV 1991 also does not include measures to prevent the misappropriation of farmers' varieties by commercial firms. In addition, the implementation of UPOV may narrow down the genetic diversity in the fields.

Countries, even those that are WTO members, are not obliged to join UPOV nor to otherwise apply the standards set out by the UPOV Convention. For the purpose of conforming to the commitments made under the TRIPS Agreement, they can implement other sui generis options which are more suitable to their needs and supportive of small-scale farmers – who account for the largest part of food production and employment in many developing countries – and of national policies on agricultural development and food security.

While UPOV provides a model of protection focused on breeders' commercial interests, the Convention on Biological Diversity (CBD) and its Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization, as well as the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), include elements reflecting other interests, notably the conservation of biodiversity, the sustainable use of genetic resources, and the fair and equitable sharing of the benefits arising from their exploitation. Since PVP legislation concerns exploitation of plant genetic

resources, a sui generis regime on plant varieties should be designed in a manner that is supportive of and coherent with the objectives and elements of these international instruments.

Developing countries are often exposed to arguments about the potential benefits of joining UPOV 1991. In addition to the mentioned pressures and obligations under FTAs, these countries have been constrained by limited expertise, institutional capacity and experience in designing regimes adequate to their realities. However, based on an inclusive process of continual engagement with relevant stakeholders, including farmers, parliamentarians and government agencies, such regimes can be developed and implemented.

This working paper offers a tool to design an alternative to a UPOV-type regime of PVP, one that is suitable to the seed supply and agricultural systems prevailing in developing countries. The proposed sui generis regime is articulated on the basis of three categories of plant varieties: (i) 'new uniform plant varieties'; (ii) 'new farmer and other heterogeneous varieties'; and (iii) 'traditional farmers' varieties'.

In the proposed model provisions, *new uniform plant varieties* are subject to a regime close to UPOV 1978, whereunder the NDUS (novelty, distinctness, uniformity and stability) requirements for the granting of breeders' rights are applicable and on registration, breeders obtain an exclusive right. This means commercial use of the propagating material of the new uniform plant variety would require prior authorization of the right holder, subject to certain exceptions.

New farmer and other heterogeneous varieties should also be registered but different requirements would apply (novelty, distinctness and identifiability). Right holders would have a remuneration right only (not 'exclusive rights'), that is, the proposed regime would not restrict commercial exploitation of the propagating materials of these varieties; however, it will require payment of remuneration (to individual farmers, farming communities or breeders that registered that variety) when such exploitation takes place. Thus, the regime essentially aims at preventing the misappropriation of varieties developed or evolved by farmers and farmers' communities, as well as of other heterogeneous varieties developed by breeders, including in public research institutions.

Commercial exploitation of the propagating material of *traditional farmers' varieties* would also give rise to a right to remuneration, but payable to a Seed Fund. The only requirement for this right to arise would be 'identifiability' of a variety; registration would not be needed.

Importantly, in recognition of the crucial role that small farmers play in the production of food in developing countries, the proposed sui generis regime exempts them from any obligation in connection with the categories of plant varieties mentioned, thereby fully safeguarding the right of small-scale farmers to freely save, use, exchange and sell seeds/propagating material. Other exceptions, consistent with the concept of Farmers' Rights, are also contemplated for other farmers.

The proposed sui generis regime also suggests the establishment of a Seed Fund which will collect remuneration from the commercial exploitation of traditional farmers' varieties and a benefit-sharing contribution when a new uniform plant variety is registered. Income from the Seed Fund will be used to support the conservation and sustainable use of plant genetic resources, particularly on-farm conservation and community seed banks, as well as to implement benefit sharing for relevant farmers and farming communities.

The proposed sui generis regime is an attempt to, inter alia, attain a right balance between breeders' rights and those of farmers and the society at large; ensure that farmers' varieties and those developed by public research and breeding institutions are not misappropriated; allow breeders to recoup their investments in the development of new varieties; expand the use of new varieties suitable to the conditions in the country, taking into account particularly the needs of small-scale farmers; support national policies of conservation and sustainable use of plant biodiversity for food and agriculture, as well as compliance with obligations under the CBD, the Nagoya Protocol and the ITPGRFA; preserve associated traditional knowledge and ensure the permanent adaptation of seeds to the evolution of agricultural ecosystems and food security; and respect, protect and fulfil human rights obligations.

INTRODUCTION

PLANT varieties were developed over centuries through the exchange of seeds and the sharing of knowledge among farmers. Even today this is the model of innovation and diffusion in agriculture that prevails in most developing countries. It is based on principles of common ownership, within a given community, and free access to materials and knowledge. However, with the development of commercial plant varieties by seed companies, a new model of production and diffusion, based on intellectual property rights, has emerged. As a result of the obligations imposed by the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), World Trade Organization (WTO) member countries have now become bound to provide for some form of intellectual property protection on plant varieties.

Intellectual property generally confers *exclusive* rights. This means that the right holder can exclude others from using the protected subject matter. If close substitutes to the protected products and processes are not available, a monopoly can be exercised during the term of protection. While originally such rights were created for mechanical inventions and works of authorship, they gradually extended to other areas, including living matter. Private commercial breeders started initiatives to establish intellectual property rights in the field of plants at the end of the 19th century, which eventually led, some decades thereafter, to the adoption of specific (sui generis) legislation in the USA and some European countries relating to plant varieties.

The creation of exclusive rights in relation to plant breeding was justified by the need to provide incentives for the development of better plant varieties. The assumption was that the generation of new varieties would increase and a diversified pool of seeds/propagating material would be available to farmers. The appropriation of plant varieties under 'plant variety protection' (PVP) brought about, however, a drastic change to the model of creation and diffusion of plant varieties based on the sharing and exchange of seeds among farmers, along which lines the development of agriculture and food production had proceeded over centuries.

With the application of modern biotechnology and the development of genetically modified plants, the model of appropriation of plant materials further deepened. Many countries – again in response to private sector demands – extended patent protection to plants (and, in some cases, plant varieties themselves). The combination of PVP and patents allowed a few biotechnology-based companies to monopolize a growing share of the seed market, while focusing on a narrow pool of genetic diversity. By the end of 2012, the global commercial seed market was estimated to be worth $44 billion. On the global level, nine commercial seed companies controlled close to 61% (with three companies controlling 45%) of the market, in contrast to 17% (three companies controlling 10%) in 1996.[1] In addition, seed sales offer corporations the opportunity to capture revenue deriving from complementary sales of chemical products.

Seeds' ability to self-reproduce and the ensuing farmers' ability to save and re-plant seeds, including their exchange, are essential to a sustainable agriculture and food security. They constitute the very essence of 'Farmers' Rights' as recognized in the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). However, these characteristics are dysfunctional to the interests of commercial seed suppliers, who may increase their income (and recoup their purported investment in developing new varieties) if the natural process of seeds' reproduction is blocked or subject to payment obligations. These suppliers protect their commercial interests through technical processes like the production of hybrids – which do not breed true – and/or through the implementation of restrictive modalities of intellectual property rights.

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[1] Based on 'The EU seed and plant material market in perspective: a focus on companies and market shares, 2013', as quoted in 'Semences agricoles – Monopole privé sur un bien public' published by the Berne Declaration and ProSpecieRara, 2014.

This paper provides a tool with a set of model provisions regarding the protection of plant varieties that, while complying with the TRIPS Agreement – in the case of the countries that are currently subject to its obligations – may allow developing countries to design a system of intellectual property that protects Farmers' Rights and is functional to the conditions of local supply systems and national policies inter alia regarding agriculture and food security.

A basic reason for the elaboration of this tool is that the UPOV Convention, as revised in 1991, that establishes the International Union for the Protection of New Varieties of Plants (hereinafter 'UPOV 1991') has emerged as the dominant model of PVP and is applied in a growing number of developing countries, often under political pressures or as a condition to obtain trade concessions. The model of protection enshrined by UPOV 1991, as discussed below, prioritizes commercial breeders' interests over those of farmers, especially small and medium landholders who contribute the major part of the agriculture and food production in most developing countries.

The purpose of this paper is not to elaborate or provide evidence on the impact of UPOV or other PVP regimes in developing countries.[2] It is, rather, based on the premise that a UPOV-type PVP system, especially if framed in accordance with UPOV 1991, may negatively affect farmers' ancestral practices of freely saving, exchanging and selling seeds/propagating material, contribute to the loss of biodiversity, lead to a growing concentration in seed supply, and ultimately endanger livelihoods and food security.

Some developing countries (e.g., India, Malaysia, Thailand) have developed sui generis PVP systems that respond to their own realities, but their rules and operations are not sufficiently known. There seems to be a knowledge gap concerning the design of a true alternative to UPOV 1991. This tool aims at contributing to filling the legal vacuum created by the lack of existing legal models compatible with the farming systems prevailing in most developing countries.

The elaboration of this tool has been based on several premises, namely that:

– UPOV 1991 is NOT the only option available to countries introducing or reforming PVP legislation;
– it is possible to design other regimes of PVP that are more flexible and better adapted to the agricultural profile of developing countries, particularly to the needs of small-scale farmers, consistent with policies of conservation, sustainable use of plant biodiversity and food security;
– such a regime would be compatible with the TRIPS Agreement, a matter of concern for countries currently bound by this Agreement;
– there is a need to balance breeders' rights and those of farmers and the society at large, supporting the formal seed system as well the informal seed sector[3] which is led by smallholder farmers, with the goal of realizing the right to food and society's welfare;
– there is a need to preserve traditional farming practices of saving, exchanging and selling seeds/propagating material, having in view the importance of ensuring the livelihood of farming communities, the continuous adaptation of seeds/propagating material to the evolution of agricultural ecosystems, and food security;
– there is a need to ensure that developments made by farmers as well as public research institutions are not misappropriated;
– there are legal models that may be applied to implement benefit sharing in the case of use of materials conserved and developed by farmers;

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2 On this subject see, e.g., Berne Declaration, *Owning Seeds, Accessing Food: A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru and the Philippines* (2014), available at https://www.bernedeclaration.ch/fileadmin/files/documents/Saatgut/2014_07_10_Owning_Seed_-_Accessing_Food_report_def.pdf.

3 The need to support the informal seed system in addition to the formal seed system has been recognized in the Voluntary Guide for National Seed Policy Formulation, which was endorsed by the Fifteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture in January 2015. See http://www.fao.org/3/a-mm546e.pdf

– there is a need to facilitate or increase diffusion of new varieties suitable to the conditions in the country concerned, taking into account particularly the situation and needs of small-scale farmers;
– national PVP regimes should respect, protect and fulfil human rights obligations, including the rights of indigenous communities;
– a PVP regime should be supportive of and not counter the objectives and the obligations under the Convention on Biological Diversity (CBD), the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization, and the ITPGRFA.

The model provisions presented in this tool (see Chapter 4), if adopted, would create a legal regime in relation to plant varieties that is different from those modelled under UPOV. The protection sought is broader in scope than that accorded under UPOV-type laws, but the rights conferred are more limited. The proposed sui generis regime is articulated on the basis of three categories of plant varieties for which different requirements and rights are provided.

New uniform plant varieties would be subject to a regime close to UPOV 1978, whereby to be protected the varieties would need to be 'novel, distinct, uniform and stable' and on registration the right holder obtains an exclusive right. Hence commercial use of the propagating material of the new uniform plant variety would require prior authorization by the right holder, subject to certain exceptions.

New farmer and other heterogeneous varieties would not be required to satisfy the criteria of uniformity and stability. For these varieties to be registered, different requirements would apply (novelty, distinctness and identifiability). Right holders would enjoy a remuneration right (not 'exclusive rights'), which means the commercial exploitation of the propagating material of these varieties would not be restricted but only subjected to payment of remuneration (to individual farmers, farming communities or breeders that registered that variety).

The commercial exploitation of the propagating material of *traditional farmers' varieties* would also give rise to remuneration, but payable to a Seed Fund. To be protected, the variety has to be 'identifiable', although registration would not be needed.

In the case of the latter two categories of varieties, the aim is to prevent misappropriation; the protection would be based on the principle of benefit sharing and could be characterized as 'defensive'.

Importantly, the proposed sui generis regime exempts small-scale farmers from any obligation in connection with any of the proposed categories of plant varieties. The model provisions preserve the right of small-scale farmers (to be defined nationally) to freely save, use, exchange and sell seeds/propagating material. Other exceptions, consistent with the concept of Farmers' Rights, are also contemplated for other farmers.

The model provisions also suggest the establishment of a Seed Fund which will collect remuneration from the commercial exploitation of traditional farmers' varieties and a benefit-sharing contribution when a new uniform plant variety is registered. Income from the Seed Fund will be used to support the conservation and sustainable use of plant genetic resources, particularly on-farm conservation and community seed banks, and payments of remuneration/benefit sharing to relevant farmers and farming communities.

The recognition of the abovementioned three categories of varieties aims at creating a system that avoids a dichotomization between breeding and farming, which would also allow countries to implement their obligations under international treaties relating to genetic resources and particularly to realize Farmers' Rights. In recognition of the crucial role that small farmers play in the production of food in developing countries, the proposed sui generis regime would exempt them from UPOV-type restrictions on saving, use, exchange and sale of seeds/propagating material.

CHAPTER 1

The Origins of Plant Variety Protection and UPOV

THIS chapter examines the origins of plant protection through intellectual property rights in the USA and Europe and the role of private nurseries and breeders in pursuing the adoption of legislation in this area. It notes the discussions held on the modalities of protection and the origins of UPOV, inspired by legislation adopted in a few European countries. This chapter looks at the main drivers behind the introduction of legal protection of plant varieties and what objectives they pursued. It also shows that such protection originated in developed countries to address the particular conditions of breeding and commercialization of plant varieties in those countries. Such conditions are very different from those prevailing in developing countries where agriculture is strongly dependent on small-scale farmers, the practices of saving, exchanging and selling seeds/propagating material and the plant varieties they conserve and improve.

The chapter further discusses the evolution of the UPOV Convention, as well as the changes in its membership after the adoption of the TRIPS Agreement with the incorporation of a larger number of developing countries.

The introduction of plant variety protection in the USA

At the end of the 19th century, a dynamic crop seed market emerged in the USA, notably as a result of on-farm experimentation, selection and discovery.[4] In parallel, the activities of nurseries specializing in fruits and flowers expanded significantly. While they benefited from the identifiability of their products and the possibility of offering visibly differentiated, standardized products, they faced the challenge of competitors that easily engaged in 'copying' and flooded the market with competing products.[5]

Several associations[6] were formed at the national, sectoral and regional levels to protect the interests of breeders and nurseries, develop standards, and lobby the government (especially against the 'free seeds program', which was implemented in the USA until 1924).[7]

Historical studies on the development of US plant variety protection reveal that the establishment of intellectual property protection for plants was, to a great extent, the result of lobbying by a nursery, Stark Brothers, a leading company in the US market at the beginning of the 20th century. Significantly, this company was not involved in actual breeding:

> Stark's business was based on varieties, not breeding. It depended on the ability to purchase new, desirable varieties as they arose, and to mass-market them. It did not depend on Stark's breeding new varieties – varieties it could not legally or practically keep out of the hands of eager and often unscrupulous competitors.[8]

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4 See Cary Fowler, 'The Plant Patent Act of 1930: A sociological history of its creation' <http://ipmall.info/hosted_resources/lipa/PlantPatent_Act/82JPatTrademarkOffSocy621.pdf>, 624.

5 Id., 627.

6 For instance, the American Association of Nurserymen, founded in the 1870s, and the American Seed Trade Association (ASTA), established in 1883.

7 Fowler, op. cit., 628, 632. Under the 'free seeds program', the US Department of Agriculture (USDA) distributed to farmers millions of packages of seed annually for free.

8 Id., 630.

Stark Brothers had attempted to avoid the propagation by third parties of the varieties they commercialized through contractual means, but this method proved to be ineffective.[9] A draft bill to create rights over plant varieties was first introduced in 1906 as an amendment to the patent law but it failed to obtain congressional support.[10] Stark Brothers and breeders' and nurseries' associations made several attempts in the following years to promote legislation on plant varieties, while addressing other issues of concern to them such as the new seed legislation adopted in various US states.[11] Despite the fact that nursery companies were mainly relying on farmers' selection and fortuitous discovery of chance mutations and not actually breeding varieties, the proponents of new legislation were slowly able to expand the idea, eventually with the support of Edison (famous for his work on the lightbulb),[12] that they merited the same protection as inventors. The basic message was that

> [i]nventors who create new values, and creative breeders who add to the transmitting efficiency of plants and animals, are alike in that they too often do not secure for themselves a reasonable remuneration. It is to the interest of the manufacturer, the grower of pedigreed seeds or pedigreed animals, and the general public that a liberal share of the new values go to the inventor and to the creative breeder.[13]

In a clever move to address concerns among US lawmakers regarding the monopolization of food, Stark Brothers suggested limiting new legislation to asexually reproduced plants[14] and excluding tubers, such as potatoes.[15] It was proposed, in fact, to only cover fruits and some flowers, so as not to deprive farmers of the right to use the products of their field as seed or to sell them as food.[16] As noted in a study on US plant variety legislation,

> … the introduction of the asexual/sexual distinction in US plant intellectual property law was as much a matter of political expediency as it was a matter of biology… [t]he nursery operators persuaded seed companies to drop efforts to secure patent legislation expressly encompassing seed-grown plants. Political considerations suggested that plant breeders should 'get established the principle that Congress recognized the rights of the plant breeder' by lobbying for the limited protection afforded by the plant patent legislation.[17]

However, the proponents of protection (correctly) speculated that the protection of asexually reproduced varieties would smoothly lead over time to the acceptance of legislation for the protection of sexually reproduced varieties.[18]

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9 Id., 630.

10 A previous attempt was made to amend the trademark law to allow the registration of names for new varieties of plants. See, e.g., Mark D. Janis and Jay Kesan, 'US Plant Variety Protection: Sound and Fury ...?' (2002), University of Illinois Working Paper No. LE03-002 <http://papers.ssrn.com/s013/papers.cfm?abstract_id=384140>, 731.

11 Fowler, op. cit., 633.

12 Id., 637, 642, 643.

13 Hays, *Distributing Valuable New Varieties and Breeds,* Proceedings of the First Meeting of the American Breeders' Association held in St. Louis, Mo., at 62 (American Breeders' Association 1905), quoted in Fowler, op. cit*.,* 634, fn. 63.

14 In asexual reproduction there is only one parent and no exchange of genetic information. As a result, the offspring are clones of the parent. Sexual reproduction requires two parents; it produces offspring that resemble their parents, but are not identical to them. Any plant obtained from seeds has been sexually reproduced.

15 Fowler, op. cit., 635.

16 Id.

17 See, e.g., Janis and Kesan, op. cit., 736.

18 See, e.g., Janis and Kesan, op. cit., 737.

As a result of these efforts, in 1930 a special title of 'plant patents' was finally introduced into US law by the Plant Patent Act, which allowed for the patenting of asexually reproduced cultivars (except tubers). The first plant patent was granted for a climbing or trailing rose.[19] The Act recognized exclusive rights[20] in relation to cultivated sports, mutants, hybrids and newly found seedlings, while excluding plants reproduced from seeds and tubers (the Irish potato and the Jerusalem artichoke) because they are 'propagated by the same part of the plant that is sold as food'.[21]

Deliberately, the protection conferred by the Plant Patent Act of 1930 extended to discoveries, thereby supporting the activities of the main proponents of the law, 'as long as the discovery was not of a completely wild plant or one growing in wild, uncultivated circumstances'.[22]

While the protection conferred by the Plant Patent Act is characterized as a 'patent', the law introduced substantial modifications to the requirements for obtaining ordinary ('utility') patents, that is, the patents that may be granted in relation to inventions in the mechanical, chemical and other technological fields. The requirement of 'distinctness' essentially replaced the requirements of utility and non-obviousness applied to utility patents.[23] The Act also eliminated the standard of sufficient written description of the invention to enable a person skilled in the art to reproduce it.[24]

The intellectual property protection of plant varieties was complemented in the USA by the enactment of the Plant Variety Protection Act of 1970 (PVPA),[25] which introduced UPOV-type protection.[26] The PVPA extends protection only to sexually reproduced and tuber propagated plants (Section 42). Interestingly, until 1995, under this Act farmers were allowed to save an unlimited quantity of seed and to sell up to half the crop produced from a protected variety. The situation changed after a US Supreme Court decision interpreted that a farmer could only save the amount of seed of a protected variety necessary to plant on their own farms.[27] A 1994 amendment to the PVPA subjected the sale of protected seed to the breeder's right.

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19 See http://inventors.about.com/od/weirdmuseums/ig/Inventive-Thinking/First-Plant-Patent.htm.

20 35 U.S. Code § 163: 'In the case of a plant patent, the grant shall include the right to exclude others from asexually reproducing the plant, and from using, offering for sale, or selling the plant so reproduced, or any of its parts, throughout the United States, or from importing the plant so reproduced, or any parts thereof, into the United States.' Infringement of these rights occurs by the asexual reproduction of a patented plant or by selling or using a plant so reproduced (the taking of plant material or cuttings is sufficient to find infringement). See *Yoder Brothers, Inc. v. California-Florida Plant Corp. et al.* (537 F.2d 1347, 193 U.S.P.Q. 264, 1976-2 Trade Cases 61,047) <http://openjurist.org/537/f2d/1347/yoder-brothers-inc-v-california-florida-plant-corporation-california-florida-plant-corporation>.

21 US Patent and Trademark Office, 'Introduction: The Act, Scope, Type of Plants Covered [R-11.2013]' <http://www.uspto.gov/web/offices/pac/mpep/s1601.html>. Bulbs, corms, stolons and rhizomes have been deemed to be outside the tuber exception and, hence, protectable under the Act.

22 Fowler, op. cit., 641. In *Yoder Brothers, Inc. v. California-Florida Plant Corp. et al.,* the court held that 'the whole key to the invention of a new plant is the discovery of new traits plus the foresight and appreciation to take the step of asexual reproduction' (para. 171).

23 The law did not define the concept of 'distinct'. The report of a Senate Committee noted in this regard that 'in order for a new variety to be distinct it must have characteristics clearly distinguishable from those of existing varieties'.

24 35 U.S. Code § 162: 'No plant patent shall be declared invalid for noncompliance with section 112 if the description is as complete as is reasonably possible.'

25 7 U.S.C. §§ 2321-2582.

26 The influence of the private sector in shaping this law was also paramount. The PVPA exempted from PVP protection 'the seeds, plants, or transplants of okra, celery, peppers, tomatoes, carrots, and cucumbers' 'for reasons apparently related to the interests of the Campbell's Soup Company, not to any logical delineation of the variety concept' (Mark D. Janis and Stephen Smith, 'Technological Change and the Design of Plant Variety Protection Regimes' (2013), *Chicago-Kent Law Review*, 82(3), 15, fn. 61).

27 *Asgrow Seed Company, Petitioner v. Denny Winterboer and Becky Winterboer, Dba Deebees,* January 18, 1995, available at https://www.law.cornell.edu/supct/html/92-2038.ZO.html.

Despite earlier failures to extend by legislative act utility patents to plant varieties,[28] such extension became a reality after the Supreme Court affirmed in *re Chakrabarty*[29] the patentability of living materials.[30]

As a result, plant varieties may be protected in the USA through three different regimes:

– the PVPA, under which UPOV-type protection applies to sexually reproduced plants, tuber propagated plants and F1 hybrids;[31]
– utility patents, including for genetically engineered plants and plant components (e.g., genes and cells);
– plant patents (a special type of patent) in the case of asexually reproduced plants.

Despite the adoption of the PVPA and the possibility of obtaining utility patents over plant varieties, the system instituted by the Plant Patent Act of 1930 for asexually reproduced plants has continued to be widely used. Between January 1, 1989 and December 31, 2013, 17,591 plant patents were granted, 43% of which were filed by US applicants.[32]

1.2 The development of a sui generis regime in Europe

The growth of the seed trade at the end of the 19th century in several European countries gave impetus to early demands for intellectual property protection in relation to seeds. Article 1(3) of the Paris Convention for the Protection of Industrial Property (hereinafter 'the Paris Convention')[33] opened up the possibility of 'industrial property' protection for plant genetic materials and agricultural products.[34] The establishment of the International Bureau of the Union for the Protection of Industrial Property in 1883 'provided an incentive for plant breeders to establish their claims for IPP [intellectual property protection] on new plant varieties'.[35] The Association Internationale pour la Protection de la Propriété Intellectuelle (AIPPI), created in 1897, became a forum for the discussion of initiatives to provide 'industrial property' protection in the realm of plants.[36]

Like in the USA, various attempts were made to extend patent protection to plant varieties in Europe since the beginning of the 20th century. This possibility, however, raised concerns among breeders and law professionals, given the incremental type of innovation that characterizes plant breeding and the difficulty in meeting the patentability standards, as well as fears regarding possible distortions of the patent system.[37]

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28 The possibility of extending utility patent protection to plant varieties had been rejected in the 1960s by the US Congress. Janis and Kesan note that in 1966 'the President's Commission on the Patent System recommended deleting from the patent statute all provisions relating to plants and providing "another form of protection," on the grounds that the Commission "does not consider the patent system the proper vehicle for the protection of [plant] subject matter, regardless of whether the plants reproduce sexually or asexually"' (Janis and Kesan, op. cit., 737).

29 447 U.S. 303, 309, 206 U.S.P.Q. 193 (1980).

30 The first patent covering plants or segments thereof was issued by the US Patent and Trademark Office in *Ex parte Hibberd,* 227 U.S.P.Q. 443 (Bd. Pat. App. 1985). The patent covered genetically engineered maize with high levels of tryptophan. Thereafter, a large number of patents were granted in the area of plants, including plant varieties as such.

31 F1 hybrids are the first generation of offsprings of distinctly different parental lines.

32 See US Patent and Trademark Office, 'Plant Patents' (2013), January 1, 1989-December 31 <http://www.uspto.gov/web/offices/ac/ido/oeip/taf/plant.pdf>.

33 This Convention deals with patents, trademarks, designs and other modalities of intellectual property rights.

34 Article 1(3): 'Industrial property shall be understood in the broadest sense and shall apply not only to industry and commerce proper, but likewise to agricultural and extractive industries and to all manufactured or natural products, for example, wines, grain, tobacco leaf, fruit, cattle, minerals, mineral waters, beer, flowers, and flour.'

35 Biswajit Dhar, 'Sui Generis Systems for Plant Variety Protection. Options under TRIPS' (2002) <http://www.qiap.ca/documents/SGcol1.pdf>.

36 AIPPI membership has included lawyers, patent attorneys and trademark agents as well as judges, scientists and engineers; currently, corporations can also be members. See https://www.aippi.org/?sel=aims.

37 AIPPI opposed the patenting of plant varieties 'on the grounds that doing so would stretch basic patent law concepts like inventiveness to the point of undermining the credibility of the patent system' (G. Dutfield, *Intellectual Property Rights and the Life Science Industries*, Ashgate, 2003, 186).

In the USA, as noted above, the efforts of commercial nurseries and breeders focused on an amendment to the patent law, and culminated in fact in an adaptation of that law to the special characteristics of plant breeding. In Europe, the approach was somewhat different as it increasingly pointed towards a special regime of protection for plant varieties. Thus, the Congrès Pomologique de France suggested, in 1911, the need for such special protection.[38] This view gradually became prevalent among European commercial breeders; it underpinned the position of the International Association of Plant Breeders for the Protection of Plant Varieties (ASSINSEL), which was established in Amsterdam in 1938.

Early attempts to introduce some form of specific PVP were made in Germany (1895) and France (1922).[39] In 1930 there was an unsuccessful attempt in Germany to require the breeders' authorization for marketing protected seed and the derived seed for the first two generations (three in the case of potato) for 20 years (with a possible extension to 30 years).[40] The first piece of PVP legislation was introduced in the Netherlands in 1942, followed by Germany in 1953.[41] The design of this legislation was influenced by concepts developed in the context of seed regulations, i.e., legislation enacted to ensure the identification and quality of seeds. Although motivated by other concerns, the basic requirements of seed regulations (distinctness, homogeneity, stability) provided an alternative model to the standards generally imposed by patent laws. In turn, the national PVP laws inspired further initiatives aiming at the establishment of a sui generis international regime on the matter.

In June 1956, the Semmering Congress of ASSINSEL stressed the need for an international conference to adopt an international system for the protection of new plant varieties.[42] It was in response to this call and to ASSINSEL's lobbying that, in February 1957, the French government decided to invite European countries that were deemed to share France's concerns on this issue,[43] to a diplomatic conference in Paris for the negotiation of an international instrument on plant variety protection.[44] The Final Act of the conference, adopted in May 1957, contained some of the elements of the future international regime on the matter as would be enshrined in the UPOV Convention. In particular, the Paris conference concluded that plant variety protection should be granted when a variety was distinct from preexisting varieties and sufficiently uniform and stable in its essential characteristics.[45] The Final Act defined the rights of the breeder and acknowledged the principle of the independence of protection.

While an important step towards the establishment of an international system of PVP was taken in the Paris conference, the Lisbon Diplomatic Conference on the Revision of the Paris Convention for the Protection of Industrial Property held in 1958 discussed the possible grant of patents in relation to plant varieties. However, no amendment to the Convention was adopted. The general view at the Lisbon conference was that a 'special law' was needed to protect new plant varieties.[46]

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38 See Michael Blakeney, 'Plant Variety Protection, International Agricultural Research, and Exchange of Germplasm: Legal Aspects of Sui Generis and Patent Regimes', Chapter No. 4.7, in *MIHR-PIPRA IP Handbook of Best Practices* <http://www.iphandbook.org/handbook/ch04/p07/>.

39 See André Heitz, 'The History of Plant Variety Protection', in UPOV, *The First Twenty-five Years of the International Convention for the Protection of New Varieties of Plants* (1987).

40 Id.

41 See Geertrui Van Overwalle, 'Patent Protection for Plants: A Comparison of American and European Approaches' (1999), *IDEA – The Journal of Law and Technology*, 39(2), 161. The German law of 1953 set an important precedent by exempting breeding activity from liability. See, e.g., Janis and Kesan, op. cit., 739.

42 Blakeney, op. cit.

43 West Germany, Austria, Italy, Belgium, Spain and the Netherlands. Denmark, Norway and Switzerland participated as observers. See Dutfield, op. cit., 186.

44 Blakeney, op. cit.

45 Dutfield, op. cit., 186-187.

46 See Dhar, op. cit., 4.

At the second session of the conference for the negotiation of an international instrument on plant variety protection, held in Paris in late 1961, the International Convention for the Protection of New Varieties of Plants, establishing the Union pour la Protection des Obtentions Végétales (UPOV), was adopted. Significantly, the Convention introduced an exception for the use of a protected plant variety for further breeding, a possibility that may be excluded under patent law.

1.3 Adoption and evolution of UPOV: towards broader and enhanced protection of breeders' rights

The UPOV Convention adopted in 1961 set binding minimum standards of PVP. It was revised in 1972, 1978 and 1991. While the first two revisions did not substantially alter the system of protection, the 1991 revision brought about significant changes (further discussed in Chapter 3). It expanded and strengthened the rights conferred to breeders while limiting the rights of farmers to save, use and exchange seeds.

Accession to the Union created by the UPOV Convention has been made conditional upon the acceding country's capacity to give effect, under its domestic law, to the provisions of the Convention.[47] This means, as discussed in Chapter 2, that a country wanting to join UPOV must have its PVP law reviewed and approved by the UPOV Council.[48]

While the aim of the proponents of the UPOV Convention was to extend the new model of protection internationally, the process was, however, extremely slow. In the 1960s only three European countries introduced breeders' rights laws; eight did so in the 1970s. As mentioned, the USA also passed a Plant Variety Protection Act in 1970 which introduced UPOV-type PVP. Thereafter, plants could be protected in that country through both the Plant Patent Act of 1930 and PVP under the 1970 Act, a possibility that was, as a matter of principle, excluded under the UPOV Convention 1961 (Article 2(1)) at that time. This temporarily prevented the USA – despite its having been the first country to introduce intellectual property rights in agriculture – from acceding to UPOV.[49]

Generally developing countries did not consider adopting any PVP system, including a UPOV-type regime, until the 1990s, reflecting the perception that such a model of protection was not suitable to the conditions under which agricultural activities took place in those countries. In fact, PVP not only originated in European countries but remained as a form of protection predominantly applied in developed countries for more than 30 years after the signature of the UPOV Convention in 1961.

The membership of the UPOV Convention was historically small. It was negotiated and adopted by six countries from Western Europe. Within the first 17 years of its life, until the revision of the Convention conducted in 1978,[50] it had only attracted the accession of 12 states.[51] The 1991 revision of the Convention was negotiated by only 20 UPOV member countries, out of which only one (South Africa) was a developing

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47 Article 30(2) of the 1991 Act of UPOV: 'It shall be understood, on depositing its instrument of ratification, acceptance, approval or accession, as the case may be, each State or intergovernmental organization must be in a position, under its laws, to give effect to the provisions of this Convention.'

48 Article 34(3) of the 1991 Act of UPOV: 'Any State which is not a member of the Union and any intergovernmental organization shall, before depositing its instrument of accession, ask the Council to advise it in respect of the conformity of its laws with the provisions of this Convention. If the decision embodying the advice is positive, the instrument of accession may be deposited.'

49 The ban on the accumulation of protections was lifted by the UPOV revision of 1978 (Article 37) for countries that already practised it, and it was repealed altogether by the UPOV revision in 1991.

50 Article 27(1) provided that '[t]his Convention shall be reviewed periodically with a view to the introduction of amendments designed to improve the working of the Union'.

51 See Blakeney, op. cit., 402.

country; 17 developing countries participated as observers.[52] The low participation of developing countries in setting the UPOV regime is in sharp contrast to the negotiations leading to the adoption of the Convention on Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture (see Chapter 2), in which developing countries played a key role.

A turning point in UPOV membership occurred after the adoption of the TRIPS Agreement in 1994: 45 out of the 72 current members, plus the European Union and the African Intellectual Property Organization (better known under the acronym OAPI for its French name, Organisation Africaine de la Propriété Intellectuelle),[53] were incorporated after 1995. UPOV currently has 72 members, still a much lower number than the membership of the Paris Convention and other conventions administered by the World Intellectual Property Organization (WIPO), but significantly higher than 20 years ago.

After the entry into force of UPOV 1991 (April 24, 1998), countries seeking to accede to UPOV had no option but to sign up to the 1991 version of the Convention,[54] which, as examined in Chapter 3, expands the breeder's right and is more limitative of farmers' practices than the 1978 version. However, most developing countries that joined the 1978 Act have chosen to remain bound by that Act. The developing countries that shifted from UPOV 1978 to UPOV 1991 in most cases were required to do so to comply with obligations imposed in free trade agreements entered into with the USA or the European Union (see Chapter 3) or the European Free Trade Association.

It is also worth mentioning that many developing countries that provide intellectual property protection for plant varieties are not members of UPOV but have established alternative sui generis systems (see Chapter 3), while others have not established any form of such protection.

As discussed in Chapter 2, the TRIPS Agreement made the protection of 'plant varieties' mandatory. The UPOV system appeared to many countries as a ready-to-use legal framework for PVP to comply with the TRIPS obligations. In addition, the implementation of a UPOV-based regime could be undertaken with technical support from the UPOV Secretariat. These factors probably heavily influenced the choice by some developing countries to opt for a UPOV-based regime, despite the possibility allowed by the TRIPS Agreement to develop sui generis regimes better adapted to the characteristics of each country's agricultural production and compatible with farmers' traditional practices. Moreover, in many cases, the adoption of a UPOV-style system and the accession to UPOV was not the result of a thorough assessment of the benefits and costs of such a system, nor of its perceived advantages over other possible sui generis options, but rather the result of unilateral pressures or straightforward obligations imposed in free trade agreements (see Chapter 3).

1.4 Conclusions

Private nurseries and breeders from a few developed countries pioneered the legislative movement towards the creation of exclusive rights over plant varieties. As breeding became a business activity in its own right, commercial breeders started to demand some form of exclusive rights over the new plant varieties they discovered or developed. The creation of such rights, however, was not just 'the simple unfolding of legal logic, an inevitable response to a major scientific advance. Nor can it be easily understood as the institutionalization of custom or as a simple expression of public opinion'.[55] It was rather the triumph of a group of business organizations that were able to articulate their interests through legislative processes, without the participation of other relevant stakeholders, notably farmers and consumers. The legal regimes so created became inexpugnable fortresses for the protection of the interests of those who had the means and capacity to influence lawmaking.

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52 See UPOV, Record of the Diplomatic Conference for the Revision of the International Convention for the Protection of New Plant Varieties, Geneva, 1991, 535-543.

53 OAPI joined UPOV as a member in 2014.

54 See Article 37(3), 'Closing of the 1978 Act', of UPOV 1991.

55 Fowler, op. cit., 622.

Interestingly, the process of adoption of the 1930 US Plant Patent Act showed the society's resistance to creating exclusive rights over plants for the production of food, and the search for a legal regime adapted to the characteristics of plant breeding.

The UPOV regime was conceived for the agricultural systems and modalities of seed production prevailing in the USA and European countries. Developing countries were conspicuously absent in the process of creation and strengthening (through UPOV 1991) of that regime. It should not be surprising, therefore, to find that many developing countries have not adopted legislation for plant variety protection, or that they did so only when such protection was required by the TRIPS Agreement, in some cases with legislation that falls outside the UPOV model. As discussed in Chapters 3 and 5, this model, particularly as shaped under UPOV 1991, is inappropriate for developing countries where farmer-managed seed systems, generation and supply prevail.

This paper attempts to offer an alternative to a UPOV-type regime of PVP, one that is better adapted to the seed supply and agricultural systems prevailing in developing countries (see Chapter 4). It also discusses how sui generis legislation may be designed with the participation and taking into account the interests and views of all relevant stakeholders, including small farmers (see Chapter 5).

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CHAPTER 2

The International Legal Context for the Protection of Plant Varieties

THIS chapter elaborates on the scope of the obligation to protect plant varieties imposed by Article 27.3(b) of the TRIPS Agreement[56] and the flexibilities allowed by this provision. It also briefly refers to the failed review of the article, and to the unfinished discussions in the WTO on the relationship between the TRIPS Agreement and the Convention on Biological Diversity.

The chapter then introduces other international instruments (CBD, Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization,[57] ITPGRFA) relating to genetic resources, and highlights elements in those instruments that are relevant for the design of legal regimes for plant varieties. Reference is also made to the ongoing negotiations on genetic resources and traditional knowledge in the World Intellectual Property Organization.

Finally, the chapter examines how the UPOV accession rules (which, as noted in Chapter 1, make accession conditional upon the full compatibility of the national law with the Convention) limit the policy space available to contracting parties. The chapter also explores the limited available flexibilities under UPOV, especially UPOV 1991. The rigidity of the UPOV model will be contrasted with the room for manoeuvre offered by other sui generis options.

2.1 The protection of plant varieties under the TRIPS Agreement: flexibilities regarding the model of protection under Article 27.3(b)

Countries that are not members of the WTO nor of UPOV may decide whether or not to establish plant variety protection and, if they do so, have full freedom to determine the scope and other characteristics of such protection. The situation is different for WTO members, which are bound under the TRIPS Agreement by a general[58] obligation to protect plant varieties. However, this obligation does not apply to WTO members which are least developed countries (LDCs), as they enjoy a transitional period until July 1, 2021, during which period they need not implement the TRIPS standards. This transitional period can be extended.[59]

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[56] This article reads: 'Members may also exclude from patentability:
…
(b) plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. *However, Members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof. The provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement*' (emphasis added).

[57] Hereinafter 'the Nagoya Protocol'.

[58] Unlike in the case of patents, trademarks and other titles covered by the TRIPS Agreement, the Agreement does not specify the scope, rights conferred, duration or other features of the protection to be granted to plant varieties.

[59] See http://www.wto.org/english/tratop_e/trips_e/ldc_e.htm. LDCs have the right, in accordance with Article 66.1 of the TRIPS Agreement, to be granted further extensions of the transitional period ('the Council for TRIPS shall, upon duly motivated request by a least-developed country Member, accord extensions of this period').

Article 27.3(b) of the TRIPS Agreement authorizes WTO members to exclude from patentability, inter alia, 'plants'. However, members must provide protection for 'plant varieties' either by patents or by 'an effective sui generis system or by any combination thereof'. This means that, while WTO members may deny the grant of patents for a plant, for instance, a genetically modified plant,[60] they have to provide for patents or other intellectual property rights in relation to a 'plant variety', that is, a *grouping of plants* that share some essential characteristics.

Article 27.3(b) of the TRIPS Agreement provides

> a much needed 'safe space' for governments to harmonize conflicting norms and policies – a space that is lacking in other areas of the TRIPs [sic] Agreement… Nothing in TRIPs requires states to adopt the exclusive rights approach, nor does it indicate which exclusive rights must be granted to new varieties.[61]

As a result,

> countries have considerable latitude and space to be legally imaginative as they implement this obligation, which makes it ripe for forum-shopping for norms that might ameliorate some of the adverse implications of introducing IP [intellectual property] in plant varieties.[62]

Since the TRIPS Agreement does not specify the concept of 'plant varieties', WTO members can adopt a narrow or broad definition of the concept, depending on each particular country's conditions and the objectives pursued. This is an important *flexibility* built into the Agreement.

Thus, a WTO member *may* decide to limit protection to plant varieties defined – as is the case under UPOV – on the basis of uniformity and stability, or to extend it, based on equity or other grounds, to plant groupings that are relatively heterogeneous and not stable, such as farmers' varieties. The only condition for introducing such broader protection is that it should not be inconsistent with other provisions of the TRIPS Agreement.[63] Members may also limit protection to a set of species or genera as well as differentiate the level of protection conferred to different categories of varieties by granting, for instance, stronger rights in the case of narrowly defined varieties, as compared to those granted in respect of more heterogeneous populations.[64]

The distinction between what is mandatory and what is not required under the TRIPS Agreement is important, since no member may be subject to complaints under the dispute settlement procedures of the WTO (which may eventually lead to trade sanctions) in relation to protections that are not binding under the Agreement.

While all WTO member countries are bound to protect plant varieties, a second and important flexibility is that they can choose the *modality and level of protection*. The scope for such a choice is broad, since the only condition established by Article 27.3(b) is to provide 'effective sui generis' protection. The UPOV Convention is not mentioned in this provision. Hence, members may adopt UPOV-style legislation, but may equally opt for other forms of sui generis protection that are not UPOV-compliant.

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60 Logically interpreted, the authorized exclusion from patentability is applicable to plants' parts and components as well, since patenting the latter may be equivalent to patenting the plant as such. The owner of a patent on a component (e.g., a transit peptide in a genetic construct that provides resistance to herbicides) could prevent commercial acts relating to any plant that contains the patented subject matter and thereby nullify, in practice, the exclusion relating to patents for plants. See, e.g., Carlos Correa, *TRIPS-Related Patent Flexibilities and Food Security. Options For Developing Countries* (ICTSD-QUNO 2012).

61 Laurence Helfer, 'Intellectual Property in Plant Varieties: International Legal Regimes and Policy Options for National Governments' (2004), FAO Legislative Study 85 <ftp://ftp.fao.org/docrep/fao/007/y5714e/y5714e00.pdf>, 39 and 58.

62 Dwijen Rangnekar, 'Geneva Rhetoric, National Reality: The Political Economy of Introducing Plant Breeders' Rights in Kenya' (2013), *New Political Economy* <http://dx.doi.org/10.1080/13563467.2013.796445>, 2.

63 See Article 1.1 of the TRIPS Agreement.

64 See, e.g., Dan Leskien and Michael Flitner, 'Intellectual Property Rights and Plant Genetic Resources: Options for a *Sui Generis* System', Issues in Genetic Resources, No. 6, June 1997, 54.

'Sui generis' means 'unique', 'of its own kind',[65] a concept that indicates that WTO members have broad policy space to define how the protection is conferred, as further explored in Chapter 4.

'Effective' means 'successful in producing a desired or intended result'.[66] This may be interpreted as requiring that the substantive norms and the enforcement mechanisms are such that the intended objectives of the protection are achieved. Those objectives may encompass not only the level of profits or revenues of the right holder, but the public interests pursued with the adoption of the protection, such as safeguarding food security and promoting a sustainable agriculture. Notably, the objective of the TRIPS Agreement is to 'contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge in a manner conducive to social and economic welfare, and to a balance of rights and obligations'.[67]

One view expressed is that, in order to be 'effective', a sui generis system of protection should possess the same basic characteristics as those that generally apply in relation to the protection of property rights, whether real, tangible or intangible: the nature of the subject matter must be identified clearly enough to enable a distinction to be drawn between what falls within and what is beyond the scope of the law; who is entitled to obtain property rights must be established; the circumstances in which the rights exist and the limitations apply must be spelt out; the period during which the rights are in force and the circumstances, if any, under which the rights expire early or under which they can be extended must be specified; and the legal action available to the right holder to enforce its rights along with the remedies available must be indicated, unless these are provided for in other laws such as a code of civil procedure.[68]

As noted by many developing countries in the debates on the review of Article 27.3(b) of the TRIPS Agreement, this Agreement 'does not specify criteria by which to judge whether a sui generis system is effective and therefore this should be left to Members to decide'.[69]

Article 27.3(b) refers to the possible protection of plant varieties by patents or by a combination of patents and a sui generis system. However, neither patents alone nor in combination with a sui generis system are advisable methods of protecting plant varieties. Although in some countries (e.g., the USA, Australia, Japan) a plant variety may be patentable as such, there is no obligation to follow this approach. The inventive step/non-obviousness standard generally applied under patent law is unsuitable to plant varieties. Moreover, the broad exclusive rights granted by patents may be exercised to prevent farmers from saving and reusing seeds, as well as to deter further research and breeding on protected materials. In fact, plant varieties are not patentable in Europe and in many other countries.[70]

2.2 Pending review of Article 27.3(b)

Article 27.3(b) is the only provision in the entire TRIPS Agreement that was subjected to an early review – four years after the entry into force of the agreement that created the World Trade Organization (i.e., 1999). This short period to conduct a review – even shorter than the transitional period contemplated for developing countries and economies in transition in Article 65 of the TRIPS Agreement – suggests how difficult it was for the parties negotiating the Agreement to reach a satisfactory compromise on issues relating to the patentability of living matter.

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65 See http://www.oxforddictionaries.com/definition/english/sui-generis.

66 See http://www.oxforddictionaries.com/definition/english/effective.

67 See Article 7 of the TRIPS Agreement.

68 See WTO, 'Review of the Provisions of Article 27.3(b). Summary of Issues Raised and Points Made', Note by the Secretariat, IP/C/W/369/Rev.1, March 9, 2006, 16.

69 Id., 17.

70 See, e.g., WIPO, 'Exclusions from Patentability and Exceptions and Limitations to Patentees' Rights', study coordinated by Lionel Bently, SCP/15/3 Annex <http://www.wipo.int/edocs/mdocs/scp/en/scp_16/scp_16_inf_2.pdf>, 78.

In introducing the review clause, developed countries had possibly expected that an early revision of Article 27.3(b) could lead to the establishment of the UPOV Convention as the standard to be complied with by all WTO members with regard to plant varieties.[71]

The process of review was formally initiated in 1999. Some developing countries regarded the mandated review as an opportunity to amend the provision and limit the obligations established therein. The African Group of countries was particularly active in the debates at the WTO's Council for TRIPS on this issue. It sought the harmonization of Article 27.3(b) with the Convention on Biological Diversity and the exclusion of patents on plants, animals, micro-organisms, their parts and natural processes.[72]

In the context of such review, the African Group held, with respect to the protection of plant varieties, that the review should ensure that a balance is struck between the interests of the community as a whole and protecting Farmers' Rights and traditional knowledge and ensuring the preservation of biological diversity.[73] It suggested a confirmation that under Article 27.3(b) members had the freedom to determine and adopt regimes appropriate to their conditions,[74] and that a footnote be inserted after the sentence on plant variety protection in Article 27.3(b), stating that any sui generis law for plant variety protection can provide for: (i) the protection of innovations of indigenous and local farming communities in developing countries; (ii) the continuation of traditional farming practices including the right to save and exchange seeds, and sell farmers' harvest; and (iii) the prevention of anti-competitive rights or practices which threaten the food sovereignty of developing countries, as is permitted by Article 31 of the TRIPS Agreement.[75] Other developing countries, such as India, Thailand, Malaysia, Brazil and Venezuela, expressed similar concerns.[76]

However, by exploiting the ambiguity of the term 'review', developed countries opted for a defensive stand, suggesting that the mandated 'review' was only meant to consider the *implementation* of the provision, not its revision or amendment. Negotiations on this issue have been stalled since then.

2.3 Relevance of the CBD and the Nagoya Protocol and their relationship with the TRIPS Agreement

The adoption of the CBD in May 1992 at the Nairobi Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity represented a major step towards the establishment of international rules for the conservation of biological diversity and the sustainable use of its components. The principles of the CBD, particularly in relation to benefit sharing, provide a model that may be applied in the context of sui generis legislation covering farmers' plant varieties. Such legislation may reward farmers' contributions without introducing monopolistic rights, thereby promoting the diffusion of varieties adapted to local conditions, as further discussed in Chapter 4.

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71 During the review process, the European Communities suggested that a reference could be made to the UPOV Convention in Article 27.3(b). See WTO document IP/C/W/369/Rev.1, 16.

72 See, generally, Tshimanga Kongolo, *African Contributions in Shaping the Worldwide Intellectual Property System* (Ashgate 2013). More recently, Bolivia has also proposed to amend Article 27.3(b) to prohibit the patenting of all life forms, protect innovations of indigenous and local farming communities and their farming practices, prevent anti-competitive practices, protect the rights of indigenous communities and prevent any intellectual property rights claims over their traditional knowledge. See WTO documents IP/C/W/545, February 2010 and IP/C/W/554, March 2011.

73 Submission by the African Group, IP/C/W/404.

74 See the submission by the African Group, IP/C/W/404, 2.

75 See the submission by Kenya on behalf of the African Group, IP/C/W/163. See also WTO, 'Review of the Provisions of Article 27.3(b). Summary of Issues Raised and Points Made', Note by the Secretariat, IP/C/W/369/Rev.1, March 9, 2006, 15-16.

76 See WTO, 'Review of the Provisions of Article 27.3(b). Summary of Issues Raised and Points Made', Note by the Secretariat, IP/C/W/369/Rev.1, March 9, 2006, available at http://www.wto.org/english/tratop_e/trips_e/ta_docs_e/4_ipcw369rev1_e.pdf.

The CBD entered into force on December 29, 1993; it currently has 194 Parties.[77] It aims at ensuring the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources (Article 1). Importantly, the CBD introduced the requirement of prior informed consent (Article 15.5) and the fair and equitable sharing of benefits arising from the 'commercial and other utilization' of genetic resources, based on terms mutually agreed between the recipient and the country supplying the resources (Articles 15.4 and 15.7). The CBD thus operationalized the concept of sovereign rights over genetic resources recognized in its Article 3.

During the negotiations on the CBD, a controversial issue was the possible impact of intellectual property rights on the implementation of the Convention. The compromise text adopted in Article 16.5[78] reveals the tension between the negotiating parties' positions on the role that intellectual property rights may play in this context. While many (particularly developing countries) feared that such rights could undermine or impede the implementation of the CBD, others (mainly developed countries) thought that such rights could support the realization of the Convention's objectives. The adopted provision only establishes an obligation to cooperate and spells out the objective of the cooperation – 'to ensure that such rights are supportive of and do not run counter' to the CBD objectives.

The general framework for access and benefit sharing established by the CBD provided the basis for the adoption by many developing countries of specific legislation on the matter.[79]

Given the obstacles faced in the implementation of the CBD principles in the two decades following its adoption, and in order to provide greater legal certainty and transparency for both providers and users of genetic resources in complying with the benefit-sharing obligations,[80] developing countries promoted the negotiation of a supplementary international instrument. In October 2010, the tenth meeting of the Conference of the Parties (COP 10) to the CBD adopted the Nagoya Protocol, which clarifies such obligations not only in relation to genetic resources but also in respect of the 'derivatives' resulting from the genetic expression or metabolism of biological or genetic resources.[81]

While the TRIPS Agreement allows for or requires (as is the case regarding microorganisms and plant varieties) the protection of genetic materials, it does not contain any provisions to ensure that patent applicants have obtained prior informed consent (PIC) from the countries of origin of the genetic resources and complied with national regimes on access and benefit sharing. A possible incompatibility between the TRIPS Agreement and the CBD raised significant concerns among developing countries.

As a result, the Council for TRIPS was mandated by paragraphs 12 and 19 of the WTO's Doha Ministerial Declaration, and by paragraph 39 of the Hong Kong Ministerial Declaration to work on this issue. Like in the case of the review of Article 27.3(b), the process has been unproductive. For developed countries there is no possible clash between the two treaties, and no further action would be needed.

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77 See http://www.cbd.int/information/parties.shtml.

78 'The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives.'

79 See, e.g., Jorge Cabrera Medaglia, Frederic Perron-Welch and Olivier Rukundo, 'Overview of National and Regional Measures on Access to Genetic Resources and Benefit-Sharing: Challenges and Opportunities in Implementing the Nagoya Protocol' (2011), CISDL <http://www.cisdl.org>.

80 See Secretariat of the Convention on Biological Diversity, *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization. Text and Annex* (2011), 1.

81 See, e.g., Gurdial Singh Nijar, 'The Nagoya Protocol on Access and Benefit Sharing of Genetic Resources: Analysis and Implementation Options for Developing Countries' (2011), Research Paper 36, South Centre, available at http://www.southcentre.int/wp-content/uploads/2013/08/Ev_130201_GNjar1.pdf.

Developing countries, on their part, have focused their efforts on establishing an obligation to disclose the origin of genetic resources and associated traditional knowledge claimed in patent applications.[82] The first proposals on the subject were made in the context of the review of Article 27.3(b). However, the proposals shifted later to the consideration of possible amendments to Article 29 of the TRIPS Agreement, which deals with the general disclosure obligation imposed on patent applicants. Several submissions outlined the purposes and possible scope of a disclosure obligation relating to patent claims on genetic resources.[83] A group of developing countries, supported by the African, Caribbean and Pacific Group of States (ACP Group) and the Least Developed Countries (LDC) Group, made a proposal for a new Article 29*bis*.[84] After the adoption of the Nagoya Protocol, a new submission was made[85] that reflects some of the elements of the Protocol, such as the concept of an 'Internationally Recognized Certificate of Compliance'.[86]

In addition, proposals regarding a disclosure obligation in all intellectual property applications, including for PVP, have been submitted by a number of developing countries to the WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC).[87] This Committee is undertaking text-based negotiations with the objective of reaching agreement on one or more international legal instruments that should ensure the effective protection of traditional knowledge (TK), traditional cultural expressions (TCEs) and genetic resources (GRs).[88] Discussions at the IGC have been conducted for more than 10 years. The USA and other developed countries maintain the same negative position as in the WTO regarding a possible disclosure obligation.

The case of the 'Turkey carrot' shows how misappropriation can take place in the context of PVP.[89] While carrots are generally associated with the colour orange, this was the outcome of 'work by Dutch plant breeders who, in the 16th and 17th centuries, bred carrots in that colour in order to indulge their royalty, giving rise to the wide adoption of orange varieties as being the customary colour for carrots'.[90] Monsanto's subsidiary Seminis 'went to a part of the world where coloured carrots never stopped being cultivated – in this case, southern Turkey – and purchased some farmers' seed. After a simple process of selection, the company called this carrot its own, and has obtained plant variety rights (PVR) over it in both the United States (US PVPA Certificate 200400327) and Europe (European Union CPVO Certificate 20050779)'.[91]

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82 Countries that provide for such obligation include the Andean Community countries, Brazil, China, Costa Rica, Denmark, India, Kyrgyzstan, Norway, the Philippines, South Africa, Switzerland, Thailand and Vietnam. See David Vivas-Eugui, 'Bridging the Gap on Intellectual Property and Genetic Resources in WIPO's Intergovernmental Committee (IGC)' (2012), Issue Paper No. 34, ICTSD, Geneva, 31.

83 See, e.g., 'Elements of the obligation to disclose the source and country of origin of biological resources and/or traditional knowledge used in an invention', submission from Brazil, India, Pakistan, Peru, Thailand and Venezuela, IP/C/W/429 of September 21, 2004.

84 Communication from Brazil, China, Colombia, Cuba, India, Pakistan, Peru, Thailand and Tanzania, 'The Outstanding Implementation Issue on the Relationship between the TRIPS Agreement and the Convention on Biological Diversity' IP/C/W/474, Add.1, Add.2, Add.3, Add.4, Add.5, Add.6, Add.7, Add.8 and Add.9 Revision (also circulated as WT/GC/W/564/Rev.2 and TN/C/W/41/Rev.2), July 5, 2006.

85 TN/C/W/59, April 2011. Brazil, China, Colombia, Ecuador, India, Indonesia, African Group, ACP Group, Peru and Thailand.

86 This is a permit or equivalent document issued by a national authority as evidence of prior informed consent and mutually agreed terms, and made available to the Access and Benefit-sharing Clearing-House established by Article 14 of the Nagoya Protocol.

87 See, e.g., http://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_20/wipo_grtkf_ic_20_6.pdf.; http://www.wipo.int/edocs/mdocs/govbody/en/wo_ga_46/wo_ga_46_6.pdf. See also http://www.twn.my/title2/intellectual_property/info.service/2014/ip140205.htm and http://www.twn.my/title2/intellectual_property/info.service/2014/ip140208.htm.

88 See http://www.wipo.int/tk/en/igc/.

89 Edward Hammond, 'Biopiracy of Turkey's purple carrot', TWN, February 24, 2014**,** available at http://www.twnside.org.sg/title2/biotk/2014/btk140208.htm.

90 Id.

91 Id.

An example of a disclosure obligation in the context of PVP legislation is provided by Article 18(1) of the Indian Protection of Plant Varieties and Farmers' Rights Act 2001 which stipulates that an application for registration must

> (e) contain a complete passport data of the parental lines from which the variety has been derived along with the geographical location in India from where the genetic material has been taken and all such information relating to the contribution, if any, of any farmer, village community, institution or organization in breeding, evolving or developing the variety;
> …
> (h) contain a declaration that the genetic material or parental material acquired for breeding, evolving or developing the variety has been lawfully acquired.[92]

However, the UPOV Convention has been interpreted as preventing contracting parties from establishing a disclosure obligation as a condition for registration of a plant variety. According to UPOV 1991, the grant of the breeder's right shall not be subject to conditions other than compliance with the requirements of novelty, distinctness, uniformity and stability (NDUS), provided that the variety is designated by a denomination and that the required fees have been paid (Article 5). Further, PVP shall not be annulled or cancelled for reasons other than those indicated in Articles 21 and 22 of the Convention (UPOV 1991).[93]

The UPOV Council has stated in this regard that

> The breeder is usually required, in a technical questionnaire that accompanies his application for protection, to provide information concerning the breeding history and genetic origin of the variety. UPOV encourages information on the origin of the plant material, used in the breeding of the variety, to be provided where this facilitates the examination mentioned above, but could not accept this as an additional condition of protection since the UPOV Convention provides that protection should be granted to plant varieties fulfilling the conditions of novelty, distinctness, uniformity, stability and a suitable denomination and does not allow any further or different conditions for protection. Indeed, in certain cases, for technical reasons, applicants may find it difficult, or impossible, to identify the exact geographic origin of all the material used for breeding purposes…
>
> With regard to any requirement for a declaration that the genetic material has been lawfully acquired or proof that prior informed consent concerning the access of the genetic material has been obtained, … UPOV Convention requires that the breeder's right should not be subject to any further or different conditions than the ones required to obtain protection.[94]

In applying this approach, UPOV has deemed inconsistent with its regime legislation proposed by some developing countries, such as Malaysia,[95] and required removal of disclosure obligations (with regard to origin, prior informed consent and compliance with access and benefit-sharing legislation) before allowing

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92 See also, e.g., Article 200 of Egypt's Law 82 of 2002 (Law on the Protection of Intellectual Property).

93 It has been argued, however, that '…article 5 expressly stipulates that plant breeders' rights shall be subject to each country's formalities. Consequently, it is legally possible to establish disclosure of origin as a formal but non-substantive requirement. If this requirement is not met, the application will not be processed' (Jorge Cabrera Medaglia, 'The Disclosure of Origin Requirement in Central America. Legal Texts, Practical Experience and Implementation Challenges', ICTSD <http://www.ictsd.org/downloads/2011/12/the-disclosure-of-origin-requirement-in-central-america.pdf>, 5).

94 UPOV, 'Guidance for the Preparation of Laws Based on the 1991 Act of the UPOV Convention', UPOV/INF/6/3, October 24, 2013, 33. This document suggests that a disclosure obligation could be introduced in legislation separate from PVP, such as on 'seed quality or other marketing related regulations' (p. 75). See also 'International Harmonization Is Essential for Effective Plant Variety Protection, Trade and Transfer of Technology', UPOV Position, based on an intervention in the Council for TRIPS, on September 19, 2002 <http://www.upov.int/export/sites/upov/about/en/pdf/international_harmonization.pdf>, para. 9.

95 See http://www.upov.org/edocs/mdocs/upov/en/c_extr/22/c_extr_22_2.pdf.

accession to the Union. Peru deleted from its draft legislation a disclosure-of-origin obligation in anticipation of UPOV's opposition.[96]

A PVP application is an important checkpoint to monitor and enhance transparency with regard to utilization of genetic resources and compliance with access and benefit-sharing rules. UPOV's restrictive position on this subject undermines the implementation of the CBD and the Nagoya Protocol as well as the efforts made by developing countries to curb misappropriation of genetic resources.[97]

It is important to note that while developing countries are seeking to make disclosure of origin mandatory for patent applications through an amendment to the TRIPS Agreement, it is clear that such an amendment is not necessary for any WTO member to introduce this obligation in its national law. In fact, many WTO members (including developed countries) have done so. The same applies in relation to PVP. Following the guidance and statements by UPOV, however, it is clear that a disclosure obligation in a PVP law is considered inconsistent with the UPOV regime.

As a result, several developing countries have opted for sui generis PVP legislation outside UPOV that supports implementation of the CBD provisions, in particular through the inclusion of a disclosure requirement to implement fair and equitable benefit sharing and safeguard against biopiracy.

2.4 International Treaty on Plant Genetic Resources for Food and Agriculture

The CBD applies to all genetic resources, including plants. Given the special characteristics of plant genetic resources for food and agriculture (PGRFA), Resolution 3 of the abovementioned Nairobi Conference recognized the need

> to seek solutions to outstanding matters concerning plant genetic resources within the Global System for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Sustainable Agriculture, in particular:
> (a) Access to ex-situ collections not acquired in accordance with this Convention; and
> (b) The question of farmers' rights.[98]

This Resolution provided the basis for negotiations, conducted under the auspices of the United Nations Food and Agriculture Organization (FAO), to lay down international rules applicable to access, sustainable use and benefit sharing specifically relating to PGRFA. The International Treaty on Plant Genetic Resources for Food and Agriculture, adopted in 2001, is a specialized regime that applies to *all* PGRFA. It created a 'Multilateral System' to ensure facilitated access (for research, breeding and training for food and agriculture only)[99] in relation to a global pool of 64 crops – which account for 80% of the food derived from plants[100] – identified on the basis of interdependence and their importance to food security. Benefit sharing in respect of these PGRFA has to be provided on a multilateral basis. Negotiation of an ad hoc bilateral agreement between the supplying country and recipients is not required as transfers of materials are done through a Standard Material Transfer Agreement, a mandatory contractual agreement agreed upon by the Contracting Parties. However, disappointingly the Multilateral System has thus far been unable to generate sufficient resources to operationalize the mandatory fair and equitable benefit sharing arising from the utilization of resources accessed through the system. The need to review the benefit-sharing mechanism has already been acknowledged by the Governing Body of the ITPGRFA in 2011. Discussions on the review are currently underway.

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96 See Berne Declaration, *Owning Seeds, Accessing Food: A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru and the Philippines* (2014), available at https://www.bernedeclaration.ch/fileadmin/files/documents/Saatgut/2014_07_10_Owning_Seed_-_Accessing_Food_report_def.pdf, 42.

97 See 'Civil Society Concerned with ARIPO's Draft Regional Policy and Legal Framework for Plant Variety Protection', available at http://www.tinyurl.com/a4v5gte.

98 Resolution 3, para. 4 <https://www.cbd.int/doc/handbook/cbd-hb-09-en.pdf>.

99 Other uses of PGRFA as well as the exchange of PGRFA not listed in the Annex to the ITPGRFA are subject to the CBD.

100 See http://www.planttreaty.org/content/overview.

None of the international instruments referred to in this chapter (CBD, Nagoya Protocol, ITPGRFA) were intended to specifically deal with the protection of plant varieties through intellectual property rights. However, they contain a number of provisions that are relevant in designing a legal regime for such protection.

Article 6 of the ITPGRFA requires Contracting Parties, inter alia, to 'develop and maintain appropriate policy and legal measures that promote the sustainable use' of PGRFA, including promoting the development and maintenance of 'diverse farming systems', promoting plant breeding efforts with the participation of farmers, particularly in developing countries, to 'strengthen the capacity to develop varieties particularly adapted to social, economic and ecological conditions', broadening the genetic base of crops, promoting 'the expanded use of local and locally adapted crops, varieties and underutilized species', as well as maximizing 'intra- and inter-specific variation for the benefit of farmers, especially those who generate and use their own varieties'.

Article 12.3(d) of the ITPGRFA prevents the recipients of PGRFA within the Multilateral System from claiming

> any intellectual property or other rights that limit the facilitated access to the plant genetic resources for food and agriculture, or their genetic parts or components, in the form received from the Multilateral System.

In addition, the ITPGRFA is the first international binding instrument to recognize Farmers' Rights, taking into account

> 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 (Article 9.1).

While the implementation of Farmers' Rights is left to national laws and regulations, the treaty indicates some of the elements of such rights (Article 9.2):

– the protection of traditional knowledge relevant to PGRFA;
– the right to equitably participate in sharing benefits arising from the utilization of PGRFA; and
– the right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of PGRFA.

Importantly, the Preamble of the ITPGRFA affirms that

> the rights recognized in this Treaty to save, use, exchange and sell farm-saved seed and other propagating material, and to participate in decision-making regarding, and in the fair and equitable sharing of the benefits arising from, the use of plant genetic resources for food and agriculture, are fundamental to the realization of Farmers' Rights, as well as the promotion of Farmers' Rights at national and international levels.

In this regard, the treaty further clarifies that

> [n]othing in this Article [9] 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 (Article 9.3).

Governments may adopt different measures to integrate the commitments made under the ITPGRFA into national laws relating to plant varieties. Some of the objectives spelt out in Articles 6 and 9 of the ITPGRFA may be achieved through the adoption of legal regimes that recognize the importance of farmers' varieties, and provide appropriate mechanisms to prevent the misappropriation of farmers' varieties and for benefit sharing and which safeguard farmers' right to save, use, exchange and, in some circumstances, sell seeds/propagating materials.

These elements are ostensibly absent in UPOV-type legislation but can be adequately considered in sui generis regimes (see Chapter 4). There is no conceptual or legal obstacle to including such elements in a regime dealing with PVP, as illustrated by the sui generis regimes of some countries mentioned in Chapter 3. On the contrary, a PVP regime adapted to the conditions of developing countries may be based on a differentiated approach taking into account the needs of the formal seed sector, on the one hand, and the needs of farmer-managed systems – often called 'informal' seed supply systems – on the other, including remedies against the misappropriation of farmers' varieties. From a systemic perspective, and for practical reasons as well, it is important to coherently legislate on the whole spectrum of issues relating to plant varieties, whether produced by commercial breeders or farmers, and to clearly define the relations between different right holders. Fragmentation of the legislation may create uncertainty and thereby discourage plant breeding and the diffusion of the best-adapted plant varieties.

2.5 UPOV accession rules: a rigid modelling of national laws

As noted in Chapter 1, accession to the Union created by the UPOV Convention is conditional upon the acceding country's capacity to give effect, under its domestic law, to the provisions of the Convention (Article 30(3)). This means that the national laws of a country must be fully consistent with the Convention's provisions before the country can be accepted as a new contracting party. Thus, according to Article 34(3) of UPOV 1991:

> Any State which is not a member of the Union and any intergovernmental organization shall, before depositing its instrument of accession, ask the [UPOV] Council to advise it in respect of the conformity of its laws with the provisions of this Convention. If the decision embodying the advice is positive, the instrument of accession may be deposited.

The UPOV Council has conducted this task over the years through a detailed examination of the legislation of would-be acceding countries, thereby strongly influencing the legal regime applicable to PVP. Countries that deviate from the rigid model established by the Convention are not allowed to join. For instance:

> Prior to UPOV accession, Kenya had a requirement that 'agroecological value must surpass in one or more characteristics that of existing varieties according to results obtained in official tests'. UPOV (1996) observed this 'a departure from the principles of the UPOV Convention. The Convention does not consider that the value of a variety should be taken into account for the purposes of protection' (para. 16). Consequently, Kenya deleted this prior to accession.[101]

Another notable case is that of India. On May 31, 2002, the Indian Cabinet approved the government's decision to seek accession under the terms of UPOV's 1978 Act.[102] This meant that India had to submit its Protection of Plant Varieties and Farmers' Rights (PPVFR) Act 2001 for review by the UPOV Council. The Act, however, contains elements deemed incompatible with the Convention (even with the most flexible UPOV 1978 version).[103] As a result, India's petition would not be accepted unless the country decides to dilute provisions related to Farmers' Rights:

> …neither of the two UPOV conventions contain effective farmer's rights. What the UPOV conventions provide are narrow rights for the farmers, which can be described as farmer's privilege. Hence, if India were to become a member of UPOV, then it will not be able to maintain a strong farmer rights regime, which the PPVFR Act contains.[104]

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101 Rangnekar, op. cit., 12.

102 See http://www.grain.org/article/entries/1944-india-decides-to-join-upov.

103 The consultative committee of UPOV that examined India's application conducted a preliminary examination of India's legislation in October 2002. It raised a number of questions which were not made public. See Prabhash Ranjan, 'Recent Developments in India's Plant Variety Protection, Seed Regulation and Linkages with UPOV's Proposed Membership' (2009), *Journal of World Intellectual Property*, 12(3), 219-243. Available at SSRN: <http://ssrn.com/abstract=1696522>.

104 Id.,12.

In the case of Malaysia, the UPOV Council dismissed several elements of the proposed PVP legislation, such as allowing for criteria different to NDUS for certain categories of plant varieties and exchanges of seeds among small farmers, defining 'public interest', and establishing a benefit-sharing obligation and the mandatory deposit of samples.[105]

2.6 Conclusions

As a matter of principle, countries should be able to choose whether or not to provide intellectual property protection to plant varieties as well as what form of protection they confer, depending on the characteristics of their agriculture and seed supply systems. Improvements in PGRFA have taken place over the centuries without such protection and, arguably, its costs may exceed potential benefits if farmers are prevented from pursuing their traditional practices.

However, WTO members bound by the TRIPS Agreement, with the exception of LDCs, need to provide some form of protection for plant varieties.[106] This obligation is crafted in such a manner that significant flexibility exists to design the legal regime for such protection. Some countries, as discussed in Chapter 1, have opted for joining UPOV in order to comply with the obligation. UPOV 1991, however, offers a rigid model inappropriate for developing countries. Other sui generis options better adapted to the conditions of particular countries can be devised while respecting the commitments made under the TRIPS Agreement.

The UPOV system provides a model of protection focused on breeders' commercial interests. The CBD, the Nagoya Protocol and the ITPGRFA include elements reflecting other interests, notably the conservation of biodiversity, the sustainable use of genetic resources, and the fair and equitable sharing of the benefits arising from their exploitation. Some of these objectives and elements may be incorporated in a sui generis regime on plant varieties. The principle of benefit sharing under the CBD/Nagoya Protocol may be used as a model for certain categories of plant varieties, while the concept of Farmers' Rights as contained in the ITPGRFA (omitted in the UPOV regime) may provide the basis for recognition of the contributions made by farmers in conserving and improving plant genetic resources. These issues are further elaborated on in Chapter 4.

[105] See http://www.upov.int/edocs/mdocs/upov/en/c_extr/22/c_extr_22_2.pdf. See also the UPOV Council's comments regarding the Philippines' draft law in http://www.upov.int/edocs/mdocs/upov/en/c_extr/24/c_extr_24_02.pdf.

[106] As mentioned, LDCs are exempted until July 2021 from compliance with the TRIPS Agreement, including in relation to plant varieties. On request, the term of this exemption may be extended.

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CHAPTER 3

Concerns About the Impact of UPOV 1991 in Developing Countries

THIS chapter spells out the conditions established by UPOV 1991 that may affect the implementation of a regime of plant variety protection suitable to farmers and farmers' communities in developing countries. It deals in some detail with the main provisions in UPOV 1991 taking into account, for the purposes of comparison, the more flexible model established by UPOV 1978.

The obligation to join the UPOV Convention imposed in free trade agreements (FTAs) and economic partnership agreements is briefly examined, as are other forms of pressures exerted on developing countries to implement PVP in accordance with the Convention.

Finally, the chapter describes the main aspects of the legislation in force in India,[107] Malaysia[108] and Thailand[109] where full-fledged sui generis regimes for plant varieties have been adopted. These regimes include, in particular, protections for categories of varieties (e.g., farmers' varieties) that are not covered under the UPOV model.

3.1 Impact of UPOV in developing countries

As noted in Chapter 1, the UPOV regime was designed with the farming systems of the developed countries in mind. There are significant differences between such systems and those prevailing in most developing countries. While in developed countries farmers heavily depend on seed supplies from commercial breeders, in most developing countries farmer-managed systems, based on farm-saved seeds and the exchange and sale of seeds among farmers, are predominant and crucial to guarantee access to affordable seed for resource-poor farmer-producers, as well as to protect them from the uncertainties (in price, availability and quantity) of commercial seed supply.[110]

A main concern regarding the impact of UPOV is the extent to which it may affect the reliance of farmers on farmer-managed systems.[111] A study commissioned by the World Bank that examined the situation in five developing countries (Colombia, Kenya, Uganda, India and China) concluded in this regard that

> [f]armers' seed systems are the main source of seed and new varieties for most crops in the case study countries. IPRs [intellectual property rights] may reduce the effectiveness of these systems by limiting the saving, exchanging and selling of farmer-produced seed of protected varieties.[112]

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107 Plant Varieties and Farmers' Rights Act (PPVFR Act) 2001 <http://www.wipo.int/wipolex/en/details.jsp?id=2401>.

108 Protection of New Plant Varieties Act 2004 <http://www.wipo.int/wipolex/en/text.jsp?file_id=128880>.

109 Plant Variety Protection Act 1999 <http://www.wipo.int/wipolex/en/details.jsp?id=3816>.

110 See Berne Declaration, *Owning Seeds, Accessing Food: A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru and the Philippines,* available at http://www.bernedeclaration.ch/fileadmin/files/documents/Saatgut/2014_07_10_Owning_Seed_-_Accessing_Food_report_def.pdf.

111 See, e.g., Olivier De Schutter, UN Special Rapporteur on the right to food, 'Seed policies and the right to food: Enhancing agrobiodiversity, encouraging innovation', report (A/64/170) presented at the 64th session of the UN General Assembly, October 21, 2009.

112 N.P. Louwaars, R. Tripp, D. Eaton, V. Henson-Apollonio, R. Hu, M. Mendoza, F. Muhhuku, S. Pal and J. Wekundah, 'Impacts of Strengthened Intellectual Property Rights Regimes on the Plant Breeding Industry in Developing Countries. A Synthesis of Five Case Studies' (2005), Wageningen UR, available at http://www.iprsonline.org/resources/docs/LouwaarsCGN_Plants_05.pdf.

The extent to which breeders' rights and, more generally, intellectual property rights actually promote innovation, even in developed countries, is a source of much contention.[113] The low threshold established by the NDUS requirements under UPOV 1991 'virtually guarantees that PVP systems can play no more than a meager role in the improvement of plant varieties'.[114] Moreover, it was found that a dynamic system of seed supply may develop in the absence of IPRs. The World Bank-commissioned study mentioned above found that

> [b]y far the most dynamic private seed sector in the sample (India) has grown and diversified without benefit of any IPRs but in the context of quite liberal seed laws and in many cases through the use of hybrids as a means of appropriation.[115]

It should also be borne in mind that, as recognized in Article 9 of the ITPGRFA, farmers have contributed over the centuries to improving plant varieties and to creating a vast agrobiodiversity in the absence of any intellectual property protection.

UPOV tends to favour commercial breeders to the detriment of farmers, who are not protected against the misappropriation of their varieties nor compensated when such varieties are used by breeders as breeding material. Moreover, UPOV-based protection may serve foreign rather than local breeders. For instance, in Kenya it was found that

> PVP rights seem to have been predominantly applied for by the foreign-owned commercial exporters of flowers and vegetables to underpin commercialisation and exporting … but [appear] to play little part in stimulating local research. The system has not appeared to be very relevant to the direct concerns of Kenya's poor farmers and the crops they grow.[116]

In addition, by its very design, UPOV favours genetic uniformity in crop varieties, which can have drastic effects on biodiversity.[117]Although it is often argued that the implementation of a UPOV 1991 model does not affect the functioning of farmer-managed systems, such a model may have a number of distortive effects:

- It may limit farmers' capacity to access seeds through informal channels.
- It prohibits the sale by farmers of seeds/propagating material obtained by planting a protected plant variety, thereby depriving them of what may be an important source of income and limiting the diffusion of seeds in farmer-managed systems.
- The more dependent farmers are on the formal sector, the greater the risk to which they expose themselves (instability of household budget).
- UPOV weakens states' capacities to comply with other legal obligations, such as the CBD and obligations regarding Farmers' Rights (as discussed in Chapter 2).[118]

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113 See, e.g., Carlos Correa, 'Innovation and Technology Transfer of Environmentally Sound Technologies: The Need to Engage in a Substantive Debate' (2013), *Review of European, Comparative and International Environmental Law (RECIEL)*, 22(1), 54-61.

114 Mark D. Janis and Stephen Smith, 'Technological Change and the Design of Plant Variety Protection Regimes' (2013) *Chicago-Kent Law Review*, 82(3), 33.

115 Louwaars et al., op. cit., 3.

116 Report of the UK Commission on Intellectual Property Rights, 2002.

117 See, e.g., De Schutter, op. cit.

118 See Berne Declaration, op. cit.

3.2 Standards established by UPOV

o **One size fits all**

As noted in Chapter 2, the UPOV Convention, particularly its 1991 version, creates a rigid model for PVP. Although it contains some minimum standards (e.g., period of protection) and facultative clauses (e.g., growing or testing a variety for the grant of the breeder's right; farmers' exemption to save seeds; extension of protection to harvested materials; cancellation of a breeder's right), most provisions in the Convention spell out the specific standards to be adopted by contracting parties. Some differences may and do exist in the national laws of parties, but the Convention requires compliance with a set of detailed rules (e.g., conditions of protection, scope of breeder's rights, exceptions, etc.) that leave little or no room for diversity in implementing them.[119] Hence, the Convention creates a legal regime with a high degree of harmonization across contracting parties and very little flexibility to adapt to local conditions, especially in developing countries.

In addition, unlike other international agreements on intellectual property,[120] the UPOV Convention does not allow for any reservations. According to Article 35(1), '[s]ubject to paragraph (2), no reservations to this Convention are permitted.' The only permissible reservation was crafted to allow the USA to maintain the system of its Plant Patent Act of 1930 for asexually reproduced plants.[121]

o **Genera/species subject to protection**

UPOV 1978 provides a flexible standard relating to the scope of botanical genera and species to be protected. It does not obligate contracting parties to extend protection to all genera and species. It only requires contracting parties 'to adopt all measures necessary for the progressive application of the provisions of this Convention to the largest possible number of botanical genera and species' (Article 4(2)). Article 2(2) also allows contracting parties to limit the application of the Convention 'within a genus or species to varieties with a particular manner of reproduction or multiplication, or a certain end-use'. Contracting parties are only bound to initially apply the Convention to at least five genera or species,[122] and progressively extend it within eight years to at least 24 genera or species in all (Article 4(3)(b)). Additionally, UPOV 1978 provides for the possible extension by the UPOV Council of the term for introducing PVP 'in order to take account of special difficulties encountered by that State in the fulfilment' of its obligations (Article 4(5)).[123]

UPOV 1991 eliminated these flexibilities. Although transitional periods were stipulated for prior and future member states (5 and 10 years, respectively), there is an obligation to grant protection to 'all genera and species' (Article 3(1)(ii) and 3(2)(ii)).

It is important to preserve the possibility of restricting PVP to a limited number of genera and species. It does not make sense to develop administrative guidelines and procedures in relation to crops that are of no commercial interest in a particular country. Moreover, countries that introduce PVP for the first time should

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119 One exception is Article 13, which refers to 'measures' that 'shall have the effect' of providing for provisional protection of the breeder's right.

120 See, e.g., the International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations, and the Paris Convention for the Protection of Industrial Property.

121 Article 35(2): '[Possible exception] (a) Notwithstanding the provisions of Article 3(1), any State which, at the time of becoming party to this Convention, is a party to the Act of 1978 and which, as far as varieties reproduced asexually are concerned, provides for protection by an industrial property title other than a breeder's right shall have the right to continue to do so without applying this Convention to those varieties.'

122 Under UPOV 1961 member states were required to protect at least five of 13 genera listed in an Annex to the Convention.

123 Further, the Council could, 'in order to take account of special economic or ecological conditions prevailing' in a state intending to ratify, accept, approve or accede to UPOV 1978, decide to reduce the minimum numbers of genera/species requiring protection or to extend the periods to do so (Article 4(4)).

be able to concentrate their efforts around those crops that are relevant for their economies, taking into account, as provided for in Article 4(4) of UPOV 1978, the 'special economic or ecological conditions' prevailing in the country.[124]

o **Essentially derived varieties**

The provision on essentially derived varieties (EDVs) – a concept introduced by UPOV 1991[125] – has become one of the UPOV Convention's most problematic provisions for interpretation and application by administrative authorities and judges.[126] Article 14(5)(c) defines EDVs as varieties that 'may be obtained for example by the selection of a natural or induced mutant, or of a somaclonal variant, the selection of a variant individual from plants of the initial variety, backcrossing, or transformation by genetic engineering'.

A variety that is deemed to be an EDV cannot be commercialized without the authorization of the right holder of the initial variety (from which the EDV was derived). This means that, although a protected variety can be used by a third party to obtain a new EDV (as allowed under the 'compulsory' breeder's exemption provided for under the UPOV Convention),[127] the EDV will fall under the exclusive rights of the right holder of the initial variety (provided that this is not in itself an EDV).

The introduction of the concept of an EDV approximates PVP to patent law, as long as the latter requires a certain level of inventive step to justify the grant of a patent.[128] The concept addresses concerns about trivial improvements on protected varieties:

> …the distinctness criterion can usually be easily fulfilled due to minimal distances and, moreover, in many instances the development of something distinct to fulfil the uniformity and stability requirement may not go beyond the average ability of persons skilled in the art of breeding…This is emphasized by the fact that Art. 1 of the UPOV Convention defines, in No. IV, a breeder as being not only the person who has created but also somebody who has discovered and developed a variety. Thus, even spontaneous mutation of a protected variety may be open for protection in favor of its finder.[129]

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124 As discussed in Chapter 4, the TRIPS Agreement does not specifically address the coverage of protection for plant varieties. It can be interpreted as allowing members to reasonably determine a number of genera and species that would be eligible for PVP.

125 Under Article 14(5) of UPOV 1991, a variety shall be deemed to be essentially derived from an initial variety when it:
(i) is predominantly derived from such initial variety, or from a variety that itself is predominantly derived from such initial variety, while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of such initial variety;
(ii) is clearly distinguishable from such initial variety; and
(iii) conforms (except for the differences which result from the act of derivation) to such initial variety in the expression of the essential characteristics that result from the genotype or combination of genotype of such initial variety.

126 See, e.g., Mia Buma, 'Essentially derived varieties and the perspective of growers' <http://www.upov.int/edocs/mdocs/.../upov_sem_ge_13_ppt_8.pdf>.

127 See Article 15(1)(iii) of UPOV 1991.

128 As discussed extensively in the literature on patent law, however, many patent offices apply a lax inventive-step standard that leads to the grant of patents on minor, trivial developments. See, e.g., A. Jaffe and J. Lerner, *Innovation and Its Discontents: How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do About It* (Princeton University Press 2004).

129 Gert Würtenberger, 'Legal perspectives on Essentially Derived Varieties', *Revista Eletrônica do IBPI,* No. 8 <http://ibpibrasil.org/ojs/index.php/Revel/article/download/73/71>.

Determining when a variety is an EDV is complex.[130] Although significant efforts have been made by the UPOV members, the UPOV Secretariat and multinational seed companies[131] to clarify and make the concept operative,[132] divergent approaches and uncertainties[133] remain in determining EDVs.[134]

However problematic the concept of EDVs and its implementation is, any country wanting to accede to UPOV 1991 must incorporate it into its national law. Notably, the application of the EDV rules may reduce competition between breeders, as they risk the possibility of being prevented from commercializing a new variety if it is found to be an EDV. The International Association of Horticultural Producers (AIPH), an international organization dedicated to promoting horticultural producers, holds this view. AIPH has questioned the whole basis of EDVs, arguing that it reduces healthy competition between breeders, as it makes it difficult for new varieties to enter the market and gives existing breeders a market monopoly.[135] It is of the opinion that 'distinctiveness' is a sufficient criterion for granting breeder's rights, adding that EDVs also do not promote 'innovation and product renewal which was the basis for progress in ornamental sector'.[136]

The application of the concept of EDVs may be highly problematic in developing countries not only because of the practical difficulties in establishing when a variety qualifies as an EDV. EDVs introduce limitations that threaten the informal seed sector[137] as farmers may no longer be able to freely use protected varieties for further breeding because in certain circumstances (e.g., breeding through selection, mutants), authorization of the right holder to exploit the newly bred variety will be needed. This may adversely impact the ability of farmers to adapt protected varieties to local conditions, thus enhancing farmers' vulnerability and threatening food security.[138]

It also introduces a double standard since it only applies to *protected* varieties used as an initial source of derivation, while in cases where a farmer's variety is used to develop a new variety which is essentially derived, the breeder can obtain an independent title and is not subject to any limitation on commercialization of 'his' new variety.[139]

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130 See, e.g., Orlando di Ponti, 'Intellectual Property in Seed Business. Towards a New Upov Act?', Wageningen 10, 17, 18 November 2011 (PPt presentation).

131 See http://www.worldseed.org/isf/edv.html.

132 See the UPOV 'explanatory notes' and other materials on the subject in http://www.upov.int/tools/en/gsearch.html?cx=016458537594905406506%3Asa0ovkspdxw&cof=FORID%3A11&q=essentially+derived+varieties.

133 See APBREBES Report on the UPOV Seminar on Essential Derived Varieties, 22nd October 2013 in Geneva, available at http://www.apbrebes.org/files/seeds/APBREBES%20rep%20EDV%20Sem%2022%20Oct%2013_0.pdf. See also UPOV Seminar Report on EDVs available at http://www.upov.int/edocs/pubdocs/en/upov_pub_358.pdf.

134 According to one view, a revision of the EDV provision based on 20 years of practical experience may be necessary, for instance, by requiring DNA information of an initial variety in order to determine the existence of an EDV (di Ponti, op. cit.).

135 See presentation on 'Essentially derived varieties and the perspective of growers' at the UPOV Seminar on Essentially Derived Varieties, October 22, 2013, by Mia Buma, International Association of Horticultural Producers (AIPH), available at http://www.upov.int/edocs/mdocs/.../upov_sem_ge_13_ppt_8.pdf.

136 See APBREBES Report on the UPOV Seminar on Essential Derived Varieties, 22nd October 2013 in Geneva, available at http://www.apbrebes.org/files/seeds/APBREBES%20rep%20EDV%20Sem%2022%20Oct%2013_0.pdf.

137 Normita G. Ignacio, Joy Angelica Santos-Doctor and Rosette Ferrer, 'Essentially derived varieties and the perspective of farmer-breeders', contribution to the UPOV Seminar on Essentially Derived Varieties, October 22, 2013, available at http://www.apbrebes.org/files/seeds/Essentially%20derived%20varieties%20and%20the%20perspective%20of%20farmer.pdf.

138 Id.

139 Id.

o **Requirements for protection: NDUS**

Since its inception in 1961, the UPOV system has been based on a set of specific criteria for the grant of breeders' rights, whose adoption was strongly influenced by seed certification and marketing legislation. These criteria are: novelty, distinctness, uniformity and stability (see Table 1).

Table 1. Requirements for the grant of the breeder's right as defined in UPOV 1991

Novelty: The variety shall be deemed to be new if, at the date of filing of the application for a breeder's right, propagating or harvested material of the variety has not been sold or otherwise disposed of to others, by or with the consent of the breeder, for purposes of exploitation of the variety within one year in the territory of the Contracting Party or within four years (six years in the case of trees or of vines) in another country (Article 6). *Distinctness*: The variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of the filing of the application (Article 7). *Uniformity*: The variety shall be deemed to be uniform if, subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics (Article 8). *Stability*: The variety shall be deemed to be stable if its relevant characteristics remain unchanged after repeated propagation or, in the case of a particular cycle of propagation, at the end of each such cycle.

As noted in Chapter 2, the grant of the breeder's right under the UPOV Convention shall not be subject to different or additional conditions (Article 5(2)). In this respect, the TRIPS Agreement is more flexible than the UPOV Convention, as it does not specify what criteria are to be applied to grant PVP.[140]

The application of the novelty requirement would generally exclude from protection farmers' varieties.[141] A sui generis regime, as discussed in Chapter 4, may lift this requirement in order to grant certain rights to farmers over their varieties. For instance, the Indian Protection of Plant Varieties and Farmers' Rights Act of 2001 applies to: (1) new plant varieties; (2) extant (domestic and existing) varieties; and (3) farmers' varieties.[142] Under the PPVFR Act, 'farmers' varieties' are a subset of 'extant varieties.'[143]

Distinctness is judged against the plant varieties that are a matter of common knowledge. UPOV 1978 spells out various factors that may be considered for that purpose (such as 'cultivation or marketing already in

[140] Such flexibility also exists under the TRIPS Agreement in relation to patents. The Agreement allows WTO members to apply different concepts, whether inventive step or non-obviousness, industrial applicability or utility (see the footnote to Article 27.1 of the TRIPS Agreement). In addition, it does not define the patentability requirements, thereby leaving significant policy space for their interpretation and application at the national level. See, e.g., Carlos Correa, 'Guidelines for the examination of pharmaceutical patents: developing a public health perspective' (2006), Working Paper, WHO, ICTSD and UNCTAD <http://www.ictsd.org>.

[141] The situations where the concept of 'disposed of' does not apply are narrowly defined in the UPOV context; they would not include, for instance, farmers' exchanges of seeds. See UPOV, 'Explanatory Notes on Novelty under the UPOV Convention', UPOV/EXN/NOV, 2009, para. 6.

[142] See http://agricoop.nic.in/seeds/farmersact2001.htm.

[143] According to Article 2(j) of the PPVFR Act, 'extant variety' means a variety available in India which is:
(i) notified under section 5 of the Seeds Act, 1966 (54 of 1966);
(ii) farmers' variety;
(iii) a variety about which there is common knowledge; or
(iv) any other variety which is in the public domain.

progress, entry in an official register of varieties already made or in the course of being made, inclusion in a reference collection, or precise description in a publication'). UPOV 1991 does not mention such possible factors, thereby leaving room for UPOV members to determine the scope of the common knowledge. However, unlike UPOV 1978, UPOV 1991 restricts the possibility of considering as part of that knowledge a variety in the process of obtaining breeder's right protection or of being entered into an official register of varieties, since the variety will only become part of the common knowledge if a breeder's right is finally granted or the variety registered (Article 7, UPOV 1991).

According to Article 6(1)(c) of UPOV 1978, a variety is deemed to be 'uniform' if it is 'sufficiently homogeneous, having regard to the particular features of its sexual reproduction or vegetative propagation'. Article 8 of UPOV 1991 considers that a variety is uniform if, 'subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics'. Uniformity is assessed by 'the number of obviously different plants – "off-types" – that occur'[144] in a plant grouping, taking into account the features of their propagation.

The rationale for this requirement has been highly contested, as its current interpretation under the UPOV rules cannot be justified by agronomic reasons, and it creates incentives to narrow down agricultural genetic diversity.[145] By doing so it puts at risk the sustainability and resilience of agriculture, particularly in a context of climate change.[146]

The stability requirement is closely linked to uniformity; it means, in practice, 'continuous uniformity'.[147] The stability standard reinforces the trend towards uniformity and the erosion of the genetic base and genetic diversity. It is dictated by certain market demands, rather than by agronomic needs.

The application of the requirements of uniformity and stability excludes from protection varieties such as landraces or farmers' varieties that are more heterogeneous and variable, which are crucial for food security especially in risk-prone areas.[148] A sui generis regime of PVP may fully recognize the importance of heterogeneity and adaptability of plant varieties to changing conditions; it does not need to rely (totally or partially) on the UPOV standards. Such a regime may – as proposed in Chapter 4 – admit the application of some of these standards for commercially bred varieties, while providing a legal framework which also deals with farmers' varieties.[149]

o **Rights conferred**

One of the outstanding differences between UPOV 1978 and UPOV 1991 lies in the set of exclusive rights that national laws *must* grant to the breeder (see Table 2). UPOV 1991 dramatically expanded such rights, which are comparable to those granted under a patent. Notably, under UPOV 1978, saving, re-use and farmers' exchange of seeds for non-commercial purposes are not expressly restricted and as such generally accepted as permitted. However, under UPOV 1991, these acts are subject to the breeder's right. Although these acts may be legitimately conducted if they fall under an exception introduced, under certain conditions, at the national level (as discussed in the next sub-section), the principle has been reversed: what was *outside* the scope of the breeder's rights under UPOV 1978 is now subject to them unless eventually exempted.

144 See UPOV, 'General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants', TG/1/3, 2002, available at http://www.upov.int/en/publications/tg-rom/tg001/tg_1_3.pdf, 19.

145 See, e.g., Leskien and Flitner, op. cit., 52.

146 See, e.g., La Via Campesina, 'The Bali Seed Declaration' (2011), available at http://climateandcapitalism.com/2011/03/20/la-via-campesina-the-bali-seed-declaration/.

147 See, e.g., Leskien and Flitner, op. cit., 52.

148 Id., 51.

149 It is worth noting that the European Commission is considering the adoption of certain derogations to the current legislation to allow the marketing of 'heterogeneous material', that is, of populations of plants that are not uniform and stable.

UPOV-type protection is, like other components of the intellectual property system, based on the grant of exclusivity, that is, of a legal monopoly on the protected subject matter. Although such exclusivity is often justified by the need to provide an incentive for innovation (by allowing the right holder to recover research expenditures and to make a profit on his investment), as mentioned above innovation in plant breeding can flourish in the absence of IPRs. Moreover, establishing IPRs protection for plants is not a magic tool that would instantly and automatically lead to increased plant breeding. Many other factors should be in place for this to happen, including public support for developing improved varieties adapted to local conditions. In addition, whatever the effects of IPRs on innovation may be in a particular context, such rights limit the *diffusion* of the protected varieties; therefore, innovation does not necessarily benefit farmers, especially small farmers.

As indicated in Table 2, the set of rights conferred are much broader under UPOV 1991 than under UPOV 1978. In particular, conditioning and stocking have been added in order to enhance the breeders' ability to enforce their basic rights (production and marketing of propagating material). Exclusive rights to export and import are also specifically spelt out in UPOV 1991.

Table 2. Scope of the breeder's right under UPOV 1978 and UPOV 1991

UPOV 1978 (Article 5)[150]	**UPOV 1991 (Article 14)**
'(1) The effect of the right granted to the breeder is that his prior authorization shall be required for – the production for purposes of commercial marketing – the offering for sale – the marketing of the reproductive or vegetative propagating material, as such, of the variety.Vegetative propagating material shall be deemed to include whole plants. The right of the breeder shall extend to ornamental plants or parts thereof normally marketed for purposes other than propagation when they are used commercially as propagating material in the production of ornamental plants or cut flowers. '(2) The authorization given by the breeder may be made subject to such conditions as he may specify.'	(1)(a) Subject to Articles 15 and 16, the following acts in respect of the propagating material of the protected variety shall require the authorization of the breeder: (i) production or reproduction (multiplication), (ii) conditioning for the purpose of propagation, (iii) offering for sale, (iv) selling or other marketing, (v) exporting, (vi) importing, (vii) stocking for any of the purposes mentioned in (i) to (vi), above. (b) The breeder may make his authorization subject to conditions and limitations. (2) subject to Articles 15 and 16, acts referred to in items (1)(a)(i) to (vii) in respect of harvested material, including entire plants and parts of plants; (3) [Optional] subject to Articles 15 and 16, the acts referred to in items (1)(a)(i) to (vii) in respect of products made directly from harvested material of the protected variety; (4) [Optional] subject to Articles 15 and 16, acts other than those referred to in items (1)(a)(i) to (vii); (5) paragraphs (1) to (4) shall also apply in relation to varieties which are essentially derived from the protected variety; varieties which are not clearly distinguishable in the protected variety and varieties whose production requires the repeated use of the protected variety.

[150] A similar provision is contained in Article 5 of UPOV 1961.

UPOV 1978 contained a facultative provision (Article 5(4)) allowing contracting parties 'to grant to breeders, in respect of certain botanical genera or species, a more extensive right than that set out in paragraph (1), extending in particular to the marketed product'. UPOV 1978, hence, does not require contracting parties to extend the exclusive rights to harvested material or other marketed products, with the exception of ornamental plants that are used for commercial propagating purposes (Article 5(1)).[151]

Under UPOV 1991 the exclusive rights have been expanded so as to cover *harvested material*, including entire plants and parts of plants, 'unless the breeder has had reasonable opportunity to exercise his right in relation to the said propagating material' (Article 14(2)). Additionally, contracting parties may further extend such rights to products (e.g., soya flour, sunflower oil) made directly from harvested material of a protected variety if such an opportunity did not exist (Article 14(3)). Any other act may also be subject to exclusive rights by decision of a contracting party (Article 14(4)). Notably, this broad permission to further expand the scope of exclusiveness is not subject to a test of consistency with other provisions of the Convention.[152]

Article 14(5) of UPOV 1991 also extended the scope of the breeder's rights to essentially derived varieties and certain other varieties, thereby covering under such rights: (i) varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety; (ii) varieties which are not clearly distinguishable in accordance with Article 7 from the protected variety; and (iii) varieties whose production requires the repeated use of the protected variety.

These reforms introduced by UPOV 1991 accentuated the bias of the UPOV model towards commercial breeders' interests. The needs and interests of farmers, particularly in developing countries, received little or no consideration.

o **Exceptions**

As noted above, UPOV 1991 has subjected to the breeder's right acts that were outside the scope of UPOV 1978. This is particularly the case with the acts of saving, using, exchanging and selling farm-saved seed/propagating material, which are key elements of the concept of Farmers' Rights.[153] Article 15(2) of UPOV 1991 provides for an 'optional exception', subject to certain conditions ('within reasonable limits' and safeguarding 'the legitimate interests of the breeder'), that may be incorporated into national laws to allow farmers to use 'for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings,' a protected variety.

The importance of providing for the right of saving farmers' own seeds cannot be overstated. In some African countries, for instance, farm-saved seeds account for about 80% or more of farmers' total seed requirements.[154] The limited (optional) exception allowed by UPOV 1991 would not allow national laws to permit small-scale farmers 'to freely exchange or sell farm-saved seed/propagating material even if the breeders' interests are not affected (e.g. small amounts or for rural trade)'.[155]

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151 See, e.g., Helfer, op. cit., 24.

152 In contrast, Article 1.1 of the TRIPS Agreement allows WTO members to grant broader rights than those required under the Agreement, but 'provided that such protection does not contravene the provisions of this Agreement'. This requirement may prevent WTO members from expanding certain rights recognized under the Agreement. See, e.g., Henning Grosse Ruse-Khan and Annette Kur, 'Enough Is Enough – The Notion of Binding Ceilings in International Intellectual Property Protection' (2008), Max Planck Institute for Intellectual Property, Competition & Tax Law Research Paper Series No. 09-01 <http://ssrn.com/abstract=1326429 or doi:10.2139/ssrn.1326429>.

153 See Article 9 of the ITPGRFA, discussed in Chapter 2.

154 See, e.g., Philippe Cullet, 'Plant Variety Protection in Africa: Towards Compliance with the TRIPs Agreement' (2001), *Journal of African Law*, 45(1), 97, 106.

155 'Open Letter to Members of the International Convention for the Protection of New Varieties of Plants (UPOV)', TWN Info Service on Intellectual Property Issues (Apr14/09), April 10, 2014, available at http://www.twnside.org.sg/title2/intellectual_property/info.service/2014/ip140409.htm.

In addition, the practice of saving seeds may be completely banned, limited to certain crops and/or subjected to payment of royalties to the breeder. Further, farmers may be required to provide information to breeders on the use of farm-saved seed.[156]

A UPOV Explanatory Note on exceptions to breeders' rights recalls that the UPOV Diplomatic Conference of 1991 recommended that the provisions laid down in Article 15(2) of UPOV 1991 should not be read so as to be intended to open the possibility of extending the practice commonly called 'farmer's privilege' to sectors of agricultural or horticultural production in which such a privilege is not a common practice on the territory of the contracting party concerned.[157]

UPOV's Guidance on Article 15(2) states that 'the optional exception may be considered to relate to selected crops where the product of the harvest is used for propagating purposes, for example small-grained cereals where the harvested grain can equally be used as seed i.e. propagating material. Taken together with the recommendation relating to Article 15(2) of the Diplomatic Conference of 1991 …, the wording also indicates that it may be considered inappropriate to introduce the optional exception for agricultural or horticultural sectors, such as fruit, ornamentals and vegetables, where it has not been a common practice for the harvested material to be used as propagating material.'

If this recommendation and interpretation is followed, the 'farmer's privilege' would not be admissible for many genera/species, or its application could be questioned on the basis of different interpretations of what 'common practice' means.

UPOV 1991 retained what is known as 'the breeder's exemption', that is, the possibility of using a protected variety 'for the purpose of breeding other varieties' (Article 15(1)(iii)). This is a 'compulsory' exception, of key importance in allowing for the continuous improvement of plant varieties by third parties without the authorization of the right holder of the original variety. In fact, this exception is indispensable, as plant breeding is of an incremental nature and cannot proceed without relying on existing materials.

The breeder's exemption in UPOV 1991 is, however, limited in comparison to UPOV 1978. UPOV 1978 allows the use of the protected variety as an initial source of variation for the purpose of creating other varieties and marketing of such varieties. The authorization of the right holder is only required in cases where repeated use of the protected variety is 'necessary' for the commercial production of the newly bred variety.

In contrast, the breeder's exemption under UPOV 1991 requires the authorization of the right holder of the protected variety for purposes of commercialization in the following cases: the newly bred variety is an EDV (discussed above), or its production requires the repeated use of the protected variety or the newly bred variety is not clearly distinguishable from the protected variety.

UPOV 1991 introduced two other 'compulsory exceptions' in relation to:

(i) acts done privately and for non-commercial purposes,
(ii) acts done for experimental purposes (Article 15(1)(i) and (ii)).

The exception regarding 'acts done privately and for non-commercial purposes' had been introduced by the US PVPA in 1970 and is common under patent laws. The experimental exception is also provided for, with

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156 In Germany, for instance, seed companies sent letters to farmers demanding a full inventory for each year of what seed they are growing, in order to determine the royalty on farm-saved seed that the companies should collect. In Case C-182/01 – Saatgut-Treuhandverwaltungsgesellschaft (March 11, 2004) (http://curia.europa.eu/juris/liste.jsf?num=C-182/01), the European Court of Justice decided, however, that the plaintiff did not have the authority to ask for information about the use of protected seed without evidence that the plant was being used by the farmer.

157 UPOV, 'Explanatory Notes on Exceptions to the Breeder's Right Under the 1991 Act of the UPOV Convention' <http://www.upov.int/explanatory_notes/en/>, paras. 13 and 14. It is to be noted, however, that the Diplomatic Conference refused to include this qualification in the text of the Convention itself.

different formulations, in most patent laws.[158] The incorporation of these exceptions into UPOV 1991 follows the notable expansion of the scope of the breeder's right as compared to UPOV 1978. According to the abovementioned UPOV Explanatory Note:[159]

> The wording of Article 15(1)(i) indicates that acts which are *both* of a private nature *and* for non-commercial purposes are covered by the exception. Thus, non-private acts, even where for non-commercial purposes, may be outside the scope of the exception …
>
> The wording of Article 15(1)(i) suggests that it could allow, for example, the propagation of a variety by an amateur gardener for exclusive use in his own garden (i.e. no material of the variety being provided to others), since this may constitute an act which was both private and for non-commercial purposes. Equally, for example, the propagation of a variety by a farmer exclusively for the production of a food crop to be consumed entirely by that farmer and the dependents of the farmer living on that holding, may be considered to fall within the meaning of acts done privately and for non-commercial purposes. Therefore, activities, including for example 'subsistence farming', where these constitute acts done privately and for non-commercial purposes, may be considered to be excluded from the scope of the breeder's right, and farmers who conduct these kinds of activities freely benefit from the availability of protected new varieties.[160]

A key issue not specifically addressed by the above Explanatory Note is whether this exception would allow farmers to exchange saved seed among themselves. However, a likely reading would be that exchange is not allowed as the Note explicitly mentions 'exclusive use in his own garden (i.e. no material of the variety being provided to others)' and consumption entirely by people 'on that holding'. Assessment of the draft legislation of Malaysia[161] and the Philippines[162] by UPOV has shown that the exchange of seeds among farmers would not be permissible in the context of UPOV 1991.[163]

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158 See, e.g., Carlos Correa, 'International Dimension of the Research Exception' (2005), SIPPI Project, AAAS <http://sippi.aaas.org/intlexemptionpaper.shtml>.

159 It is worth nothing that UPOV contracting parties can make their own interpretations of the Convention, in accordance with the Vienna Convention on the Law of Treaties, in implementing their obligations.The UPOV Council has not been given the competence to issue authoritative interpretations of the UPOV Convention (in the case of the WTO, for the sake of comparison, such interpretations can only be made by the WTO Ministerial Conference with the vote of a three-fourths majority of the members (Article IX.2 of the Agreement Establishing the WTO <http://www.wto.org/english/docs_e/legal_e/04-wto.pdf>)). Having said that, it has been observed that when reviewing PVP legislation of countries wishing to become contracting parties, the UPOV Council seems to expect rather strict compliance with the 1991 Act and the interpretation in the Explanatory Notes adopted by the UPOV Council (as explained in Chapter 2). It is also worth noting that the Explanatory Notes, though not binding, may have persuasive effect on the legislative, executive and judicial authorities of countries when these countries implement plant breeders' rights based on UPOV 1991.

160 UPOV, 'Explanatory Notes on Exceptions to the Breeder's Right Under the 1991 Act of the UPOV Convention' <http://www.upov.int/explanatory_notes/en/>, paras. 5 and 7.

161 In examining the conformity of the Malaysian national PVP legislation with UPOV 1991 (UPOV document C(Extr.)/22/2), the Secretariat expressly stated that 'the exchange of protected material for propagating purposes would not be covered by the exceptions under Article 15 of the 1991 Act' and on that basis recommended deletion of Section 31(1)(e) of the Malaysian Protection of New Plant Varieties Act which contained the following exception: 'any exchange of reasonable amounts of propagating materials among small farmers'. See UPOV document C(Extr.)/22/2 available at http://www.upov.int/edocs/mdocs/upov/en/c_extr/22/c_extr_22_2.pdf.

162 In the case of the Philippines, UPOV found the farmer's exception in Section 43(d) of the PVP legislation to be incompatible with the 1991 Act. Section 43(d) states: 'The Certificate of Plant Variety Protection shall not extend to:... d)The traditional right of small farmers to save, use, exchange, share or sell their farm produce of a variety protected under this Act, except when a sale is for the purpose of reproduction under a commercial marketing agreement. The Board shall determine the condition under which this exception shall apply, taking into consideration the nature of the plant cultivated, grown or sown. This provision shall also extend to the exchange and sale of seeds among and between said small farmers: Provided, That the small farmers may exchange or sell seeds for reproduction and replanting in their own land.' UPOV in its comments notes inter alia that 'The exchange and sale of seeds among and between the said small farmers in their own land, as provided in the third sentence of Section 43(d) of the Law, go beyond the exception of Article 15(2) of 1991 Act', and calls for the Section to be amended. See UPOV document C(Extr.)/24/2 available at http://www.upov.int/edocs/mdocs/upov/en/c_extr/24/c_extr_24_02.pdf.

163 See http://www.upov.int/edocs/mdocs/upov/en/c_extr/22/c_extr_22_2.pdf and http://www.upov.int/edocs/mdocs/upov/en/c_extr/24/c_extr_24_02.pdf.

As UPOV 1991 limits the ability of farmers to freely save and exchange seed, its suitability for developing countries is questionable. In a letter issued on September 20, 2012, the Dutch Minister for Agriculture and Foreign Trade stated that 'UPOV 1991 cannot be applied to all developing countries but that a different approach is desired', adding that the Netherlands would 'urge for greater scope for the private and non-commercial use exemption in UPOV 1991 than is currently the case. This will allow small farmers that use protected varieties to trade their surpluses on the market and exchange seed among themselves'.[164]

In response to increasing criticisms over the adverse implications of UPOV's provisions for Farmers' Rights, in October 2014, the UPOV Council adopted a list of 'Frequently Asked Questions' which states that 'within the scope of the breeder's right exceptions provided under the UPOV Conventions, UPOV Contracting Parties have the flexibility to consider, where the legitimate interests of the breeders are not significantly affected, in the occasional case of propagating material of protected varieties, allowing subsistence farmers to exchange this against other vital goods within the local community'.

This response of UPOV has been criticized by the Association for Plant Breeding for the Benefit of Society (APBREBES) as being 'legally incorrect and deliberately misleading'. APBREBES has also argued that UPOV's response is not supported by the interpretation of Article 15 that has been applicable thus far or by the practices of UPOV, which has consistently rejected national draft PVP legislation that allows exchange of seeds/propagating material.[165]

In any case, UPOV's response would only allow for 'occasional' exchange. This is an indication that UPOV continues to fail to recognize that exchange of seeds/propagating material is a *regular* component of farming practices in developing countries.

Following UPOV's interpretation of the exceptions, any sale of seeds/propagating material obtained by planting protected varieties would not be allowed. Selling seeds/propagating material is an important source of income for many farmers and its prohibition could adversely impact livelihoods and access to basic necessities such as food, healthcare or education.[166]

Countries not bound by UPOV 1991 may, however, apply a sui generis regime that allows farmers to freely save, use, exchange and sell seeds/propagating material, as discussed in Chapter 4.

- **Restrictions on the exercise of the breeder's right**

Article 9 of UPOV 1978 and Article 17 of UPOV 1991 include provisions on 'restrictions on the exercise' of the breeder's right. Such restrictions can only be determined on the basis of 'public interest'. They may be implemented through an authorization given to a third party to reproduce and commercialize a protected variety. While such an authorization is comparable to a compulsory licence as permitted under Article 31 of the TRIPS Agreement in relation to patents, only one condition needs to be complied with: equitable remuneration has to be paid to the right holder. In the case of UPOV 1978, the remuneration was only due in cases of 'widespread distribution of the variety'. Under UPOV 1991, it will be more broadly applicable to any situation where the restriction 'has the effect of authorizing a third party to perform any act for which the breeder's authorization is required' (Article 17(2)).

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164 See http://www.apbrebes.org/news/dutch-minister-supports-differentiated-approach-pvp. The indicated Dutch approach does not seem to be supported by the majority of the UPOV Council.

165 See APBREBES Report on the UPOV Autumn Session, Newsletter Issue #11, November 18, 2014, available at http://www.apbrebes.org/files/seeds/files/newsletter11%2018nov2014short.pdf.

166 Berne Declaration, *Owning Seeds, Accessing Food: A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru and the Philippines,* available at http://www.bernedeclaration.ch/fileadmin/files/documents/Saatgut/2014_07_10_Owning_Seed_-_Accessing_Food_report_def.pdf.

The concept of 'public interest' is sufficiently broad for national authorities to decide when a restriction needs to be applied and a compulsory licence granted. For instance, in the case of the US PVPA, insufficiency of supply or unreasonable prices may trigger a compulsory licence:

> The Secretary may declare a protected variety open to use on a basis of equitable remuneration to the owner, not less than a reasonable royalty, when the Secretary determines that such declaration is necessary in order to insure an adequate supply of fiber, food, or feed in this country and that the owner is unwilling or unable to supply the public needs for the variety at a price which may reasonably be deemed fair. Such declaration may be, with or without limitation, with or without designation of what the remuneration is to be; and shall be subject to review as under section 71 or 72 (any finding that the price is not reasonable being reviewable), and shall remain in effect not more than two years. In the event litigation is required to collect such remuneration, a higher rate may be allowed by the court. (7 U.S.C. 2404)[167]

However, as noted above, the UPOV Council has taken a rigid approach regarding the right of UPOV members to define 'public interest', as shown by the deliberations on the draft legislation submitted by Malaysia.[168]

o **Duration**

Under UPOV 1978, the *minimum* period of protection is 15 years. For vines, forest trees, fruit trees and ornamental trees, it is 18 years (Article 8). UPOV 1991 extended these periods to 20 years and 25 years, respectively (Article 19).

While plant breeding is time-consuming, the application of marker-assisted selection (MAS) and other tools may help to reduce the period of time necessary to develop a new, distinct, uniform and stable variety. Biotechnology 'has considerably shortened the time to 7-10 years for new crop varieties to be brought to the market'.[169] This would be the case particularly when a transgenic variety is developed containing only one or few transgenes, like for insect tolerance or herbicide resistance. In the light of these developments, a long term of protection does not seem justified and may block rather than promote innovation in plant varieties. This is particularly the case when an extension beyond the mandatory UPOV terms has been introduced, as done by some laws (e.g., European Union, Kenya).

o **Nullity and cancellation**

In both UPOV 1978 and UPOV 1991, nullity must be declared when the requirements to obtain protection have not been met. UPOV 1991 expanded the grounds for nullification to include cases where 'the breeder's right has been granted to a person who is not entitled to it, unless it is transferred to the person who is so entitled' (Article 21(1)(iii)).

UPOV 1978 provides for the automatic forfeiture of the breeder's right when the right holder is no longer capable of providing the competent authority with reproductive or propagating material of the protected variety. The right may also be forfeited if, after being requested to do so, the right holder fails to provide reproductive or propagating material or information to the competent authority, or to pay the required fees.

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167 Section 44, 'Public Interest in Wide Usage' <http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELDEV3002796>.

168 Section 36 of the Malaysian PVP legislation contains several grounds on which a compulsory licence could be issued. The grounds include where an excessive proportion of the registered plant variety offered for sale is being imported (Section 36(1)(b)). On examination of the legislation, UPOV called for Section 36 to be revised 'in order to only cover cases of public interest' (which is what is mentioned in Article 17 of UPOV 1991). UPOV declared Section 36(1)(b) to be inconsistent with UPOV 1991, although the latter does not explicitly disallow such a provision. See document C(Extr.)/22/2 available at http://www.upov.int/edocs/mdocs/upov/en/c_extr/22/c_extr_22_2.pdf.

169 See International Service for the Acquisition of Agri-biotech Applications (ISAAA), *Pocket K No. 19: Molecular Breeding and Marker-Assisted Selection* <http://www.isaaa.org/resources/publications/pocketk/19/default.asp>.

UPOV 1991 eliminated the automatic forfeiture referred to. It provides for the possibility of deciding on the 'cancellation' of the breeder's right only after a request for the material has been made to the breeder.

Importantly, under both UPOV 1978 and UPOV 1991, contracting parties are not allowed to introduce other grounds for nullity or forfeiture/cancellation. Under alternative sui generis PVP systems (discussed in Chapter 4), countries would be free to include other grounds critical to safeguarding national interests, such as where the protected variety is not commercialized in a sufficient quantity to meet the demand or where the right holder is engaged in anti-competitive practices.

3.3 Pressures to join UPOV: obligations in free trade and economic partnership agreements

International harmonization of the rights conferred to breeders has often been presented as the optimal solution that satisfies both local and global interests. However, it is only by designing the applicable legislation in a manner consistent with the needs and conditions of each country that those interests can be best served. An inappropriate legislative approach in relation to such rights may decrease access to seeds and agricultural output, reduce biodiversity in the fields, and negatively affect food security as well as the realization of the human right to food.[170]

The sovereign right that countries should be able to exercise in an area of such vital importance as agriculture and food production has been constrained or bluntly ignored by developed countries in free trade agreements and economic partnerships involving developing countries.

Thus, the US FTAs have required accession of the partner countries to UPOV 1978 or 1991,[171] or specifically to UPOV 1991.[172] Examples of the latter case include the US FTAs with Bangladesh, Singapore, Chile and South Korea and the US-Central America Free Trade Agreement (CAFTA). On their part, the European Free Trade Association (EFTA)[173] and the European Union (EU) have also required accession to UPOV, or specifically to UPOV 1991, in free trade agreements and economic partnerships they entered into.[174] Interestingly, the EU agreement with Algeria provided that the latter had to accede to and implement UPOV 1991 within five years of its entry into force, but accession could be replaced by implementation of an effective sui generis system if both parties agreed.[175]

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170 See, e.g., De Schutter, op. cit.

171 For instance, Article 1701.2 of the North American Free Trade Agreement (NAFTA) required a party that had not yet acceded (the only party in this situation was Mexico) 'to make every effort' to accede to either UPOV 1978 or 1991.

172 Chile, Peru, Morocco, Jordan and Singapore, for instance, were required to join UPOV 1991 under the FTAs they entered into. It should be noted that no instrument of accession to UPOV 1978 could be submitted after December 31, 1995 for developing countries and December 31, 1993 for other countries. UPOV 1991 hence became the only option under the UPOV system for new members after those dates.

173 E.g., agreements entered into with Jordan, Morocco, Lebanon and Tunisia.

174 However, while in the Cotonou Agreement (partnership agreement between the members of the African, Caribbean and Pacific Group of States, on the one side, and the European Community and its member states, on the other side, signed in Cotonou on June 23, 2000) 'the Parties recognize the need to ensure an adequate and effective level of protection of intellectual, industrial and commercial property rights' (Article 46.1) including for plant varieties (Article 46.5), there is no obligation to join UPOV.

175 See Euro-Mediterranean Agreement establishing an Association between the European Community and its Member States, on the one side, and the People's Democratic Republic of Algeria, on the other side – Annexes 1 to 6 and Protocols Nos. 1 to 7, Council of the European Union, Brussels, April 12, 2002, 6786/02 ADD1 AL1, Annex 6, Article 3. Nevertheless, Algeria is listed among the countries that have been in contact with the UPOV Secretariat 'for assistance in the development of laws based on the UPOV Convention' <http://www.upov.int/export/sites/upov/members/en/pdf/status.pdf>.

Pressures to adopt UPOV as *the* model for the protection of plant varieties have also been exerted in other contexts outside trade negotiations,[176] where developing countries may not obtain, in exchange for accepting high standards of intellectual property protection, concessions in other areas.[177]

The case of Kenya, which joined UPOV 1991 in 1999, is instructive:

> The largely 'foreign'-owned floriculture and horticulture sectors have consistently lobbied for PBRs [plant breeders' rights]… The Seed Trader Association of Kenya (STAK), established in 1982, simultaneously acts as a conduit for international links, through its membership of the International Seed Federation, and a local/regional base for socialising IPRs, as it is the headquarters of the African Seed Trade Association. STAK has an active secretariat, busy in organising and hosting national and regional conferences with key transnational actors (e.g. UPOV) and lobbying domestic legislation. In 1993, a STAK conference co-hosted with UPOV saw the formation of the Plant Breeders' Association of Kenya (PBAK). PBAK gave lobbying for enacting PBR provisions of SPVA [Seeds and Plant Varieties Act] a collective voice… while also channeling expertise to shape the architecture of law.[178]

Pressures on developing-country governments to adopt the UPOV regime and introduce UPOV 1991 rules at the national level have met with significant domestic resistance, as exemplified by the case of Chile. The Chilean government was unable to overcome farmers', indigenous communities' and other stakeholders' resistance to the adoption of a bill implementing UPOV 1991, and was forced to withdraw it from the Congress in March 2014, more than 10 years after the commitment to join UPOV 1991 was made in the FTA signed with the USA.[179] In Colombia, the Constitutional Court declared unconstitutional a 2012 law approving the country's accession to UPOV 1991. The high court considered that the law violated the rights of indigenous groups and Afro-Colombians who were not consulted by the Congress prior to enacting the law.[180] In September 2014, the Congress of Guatemala repealed plant variety legislation that would have allowed the country to accede to UPOV 1991 as required by CAFTA. The passing of the legislation had sparked massive protests, leading to the Constitutional Court suspending the law.[181]

3.4 Sui generis models implemented in developing countries

This chapter has examined the shortcomings of the UPOV Conventions, notably UPOV 1991, in addressing the needs of developing countries, where the supply of seeds/propagating material is largely dependent on the practice of saving, exchanging and selling seeds/propagating material and on plant varieties developed or adapted by farmers. UPOV-type PVP, which focuses on new plant varieties compliant with the NDUS requirements (as discussed above), was conceived to cover varieties produced by the commercial breeding sector and research institutions. However, several countries have designed (or are in the process of doing so) sui generis regimes that take better account of the characteristics of seeds/propagating material supply in developing countries. They cover not only varieties obtained as a result of formal breeding programmes, but also those improved or held by farmers and farmers' communities, which generally do not comply with one or more of the NDUS requirements.

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176 Including 'ideational pressures' and those exerted by the UPOV Secretariat itself. See C. Deere, *The Implementation Game: The TRIPS Agreement and the Global Politics of Intellectual Property Reform in Developing Countries* (Oxford University Press 2009), 186.

177 The benefits expected from these concessions, however, often do not materialize for the developing-country parties. See, e.g., Martin Khor, 'Need to assess costs, benefits of FTAs' (2011), TWN <http://www.twnside.org.sg/title2/gtrends/gtrends365.htm>; Kevin Gallagher and Timothy Wise, 'Nafta's unhappy anniversary' (2009), January 1 <http://www.theguardian.com/commentisfree/cifamerica/2009/jan/01/nafta-anniversary-us-mexico-trade>.

178 Rangnekar, op. cit., 14.

179 See http://newamericamedia.org/trending/2014/03/chile-derails-monsanto-law-that-would-privatize-seeds.php.

180 See Shawn Sullivan, 'Colombian Court Strikes Down Law Approving 1991 Plant Variety Protection Convention', December 10, 2012 <http://sullivanlaw.net/colombian-court-strikes-law-approving-1991-plant-variety-protection-convention/>.

181 See, e.g., http://www.apbrebes.org/news?page=1. See also GRAIN, 'Trade deals criminalise farmers' seeds', November 2014, available at http://www.grain.org/article/entries/5070-trade-deals-criminalise-farmers-seeds.

The legislations of India, Malaysia and Thailand provide interesting examples of such regimes. Although this section focuses on these countries, it is worth noting that in many other countries (e.g., Zimbabwe, Ethiopia, Zambia) PVP legislation contains some elements of a sui generis regime (even if several of these countries generally follow the UPOV model) such as a disclosure obligation, recognition of Farmers' Rights, and limitations to the breeder's right based on various public interest considerations.

Eligible subject matter

The categories of plant varieties covered by the three sui generis regimes examined here (India, Malaysia and Thailand) vary significantly (see Table 3).

The Indian Protection of Plant Varieties and Farmers' Rights Act applies to (1) new plant varieties; and (2) extant varieties, which include (i) varieties already notified under Section 5 of the Seeds Act, 1966; (ii) farmers' varieties; (iii) varieties about which there is common knowledge; and (iv) any other variety which is in the public domain (Article 2(j)). Farmers' varieties are thus a subset of 'extant varieties' which includes varieties that have 'been traditionally cultivated and evolved by the farmers in their fields' and those that are a 'wild relative or land race of a variety about which the farmers possess the common knowledge' (Article 2(l)).

In Malaysia, the Protection of New Plant Varieties Act 2004 covers both new commercial and 'traditional' varieties. The latter are varieties of crops conserved by farmers to which they add value 'through the selection and identification of their useful properties' (Article 2).

The Thai Plant Variety Protection Act (PVP Act) applies to new and local varieties as well as to local domestic and wild varieties defined as follows:

- a 'local domestic plant variety' means 'a plant variety which exists only in a particular locality within the Kingdom and has never been registered as a new plant variety and which is registered as a local domestic plant variety under this Act';
- a 'wild plant variety' means 'a plant variety which currently exists or used to exist in the natural habitat and has not been commonly cultivated'; and
- a 'general domestic plant variety' means 'a plant variety originating or existing in the country and commonly exploited and shall include a plant variety which is not a new plant variety, a local domestic plant variety or a wild plant variety' (Section 3).

Table 3. Protected varieties under sui generis legislation

India	Malaysia	Thailand
(1) New plant varieties; (2) extant (domestic and existing) varieties; and (3) farmers' varieties	Commercial and 'traditional' varieties	New and local varieties; local domestic and wild varieties

Requirements for protection

Two of the sui generis regimes considered here (India, Thailand) are 'hybrids' in the sense that they incorporate the UPOV-type NDUS requirements while, in addition, either excluding the application of one or more of them or introducing a different requirement for certain categories of varieties. The Malaysian sui generis regime introduces the most significant departure from the NDUS standards in a PVP system in force.

The Indian PPVFR Act requires NDUS for the protection of new plant varieties while, as suggested by the definition mentioned above, it excludes novelty – but not the distinctness, uniformity and stability (DUS) requirements – in the case of 'extant varieties' (Article 15(2)). The exclusion of the novelty requirement

drastically expands the scope of varieties that may be protected. In fact, the overwhelming majority (around 85%) of varieties registered with the PPVFR Authority belong to this category.[182]

Section 14(2) of the Malaysian Protection of New Plant Varieties Act 2004 provides that plant varieties bred or discovered and developed by a farmer, local community or indigenous people are protectable if they are 'new, distinct and identifiable'. Novelty is not destroyed if 'the propagating or harvested material of the plant variety has not been sold or otherwise disposed of on a commercial basis by or with the consent of the breeder' (Section 14(3)(a)).[183] Uniformity and stability are not required to obtain protection. The applicable requirements, as defined, permit the protection of existing varieties insofar as they are *identifiable*[184] and have not been previously commercialized.

The Thai PVP Act does apply the DUS requirements to define a 'plant variety' (Article 2). While local domestic plant varieties do not need to comply with the novelty requirement, a modified distinctness criterion applies. Section 12(2) of the Act requires that distinctness be 'related to the feature beneficial to the cultivation, consumption, pharmacy, production or transformation, including the distinctness from the following plant varieties: (a) plant varieties already registered and protected, whether in or outside the Kingdom, prior to the date of filing the application; (b) plant varieties in respect of which application for registration has been made in the Kingdom and which will subsequently have been registered.'

There is a growing body of empirical information that would allow conclusions to be drawn on the way in which the sui generis systems considered here operate, and particularly their impact on both commercial breeders and farmers.[185] To measure the impact of PVP legislation, it is insufficient to simply rely on the number of applications or rights granted[186] as this would only hint at the extent to which the legislation is being used and by whom. An assessment of the impact of PVP legislation should go beyond this, and preferably include an analysis of the effects of the implemented regimes, inter alia, on plant breeding, biodiversity, food security and the realization of the rights accorded to farmers.

Categories of varieties and conferred rights

The examined sui generis regimes for PVP have introduced various categories of plant varieties, as noted above, and, in some cases, confer different sets of rights to the respective breeders.[187]

Under the Indian PPVFR Act, the right holder of a 'certificate of registration' enjoys an exclusive right 'to produce, sell, market, distribute, import or export the variety'. In the case of an extant variety, the same rights are conferred but, 'unless a breeder or his successor establishes his right', the central or the state government 'shall be deemed to be the owner of such right' (Article 28(1)). In other words, this legislation does not distinguish *what* rights can be exercised in respect of different categories of plant varieties but *who* is entitled to do so.

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182 Sujith Koonan, 'India's sui generis system of plant variety protection' (2014), QUNO, available at http://www.quno.org/resource/2014/1/developing-country-sui-generis-options-plant-variety-protection, 3.

183 While the wording of UPOV 1991 'otherwise disposed of to others' does not refer to commercial acts (as is the case in UPOV 1978), the UPOV 'Explanatory Notes on Novelty under the UPOV Convention' seem to consider both standards equivalent. See UPOV, 'Explanatory Notes on Novelty under the UPOV Convention' (2009), UPOV/EXN/NOV/11, available at http://www.upov.int/edocs/expndocs/en/upov_exn_nov.pdf, 7.

184 Under Section 14(3)(e), 'a plant variety is identifiable if—(i) it can be distinguished from any other plant grouping by the expression of one characteristic and that characteristic is identifiable within individual plants or within and across a group of plants; and (ii) such characteristics can be identified by any person skilled in the relevant art'.

185 See various country reports submitted to the Seventh East Asia Plant Variety Protection Forum Meeting held in Vientiane, Lao PDR, 2014, available at http://eapvp.org/report/laos/20140916_113330.html.

186 See Berne Declaration, 'UPOV report on the impact of plant variety protection – A critique', available at http://www.evb.ch/fileadmin/files/documents/Saatgut/2014_07_Critique_UPOV_report_final.pdf.

187 Under UPOV 1978, only one single category of protectable varieties was identified and, hence, the same set of rights applied to all varieties. UPOV 1991 introduced the concept of 'essentially derived varieties' and differentiated the rights that may be exercised in their respect.

The potential effects of such a broad assignment of exclusive rights may be mitigated by the state's abstention from exercising them and by the fact that Article 39(1)(iv) of the PPVFR Act provides for an exception to the exclusive rights which allows farmers to save, use, sow, re-sow, exchange, share and even sell farm produce, including the seed of a variety protected under the Act, provided that the seed is not branded.

The PPVFR Act also stipulates that

> a farmer who is engaged in the conservation of genetic resources of land races and wild relatives of economic plants and their improvement through selection and preservation shall be entitled in the prescribed manner for recognition and reward from the Gene Fund:… Provided that material so selected and preserved has been used as donors of genes in varieties registrable under this Act (Article 39(1)(iii)).

Accordingly, the 'recognition and reward' is not triggered by the conservation, development or commercialization of a plant variety, but by the fact that it has served as a 'donor' of genes for a variety which is registered.

In addition, Indian nationals and organizations can claim 'benefit sharing' in case a variety is sought to be registered by a third party, when 'genetic material of the claimant'[188] has been used in the development of said variety, taking into account 'the commercial utility and demand in the market of the variety relating to which the benefit sharing has been claimed' (Article 28(5)(a) and (b)).

In Malaysia, right holders of protected varieties can exercise exclusive rights (defined along the lines of Article 14 of UPOV 1991) which extend to

> any propagating material of the registered plant variety, harvested material of the registered plant variety and the entire or any part of a plant variety where the propagating material of that plant variety is obtained through unauthorized means from the registered plant variety (Article 30(2)).

While the breeder's exception is provided for under the Malaysian law, it does not apply in cases of EDVs (in line with UPOV 1991). Exceptions relating to saving and exchanging seeds are provided for the benefit of 'small farmers'.[189]

In Thailand, the PVP Act differentiates the protection that is accorded to various categories of plant varieties eligible for protection:

– New plant varieties are protected through exclusive rights in a way similar to UPOV 1991, but subject to a broader set of exceptions.[190]
– A comparable set of rights applies to 'local domestic plant varieties', subject also to some exceptions.[191] In addition, 'a person who collects, procures or gathers a local domestic plant variety or any part thereof for the purposes of variety development, education, experiment or research for commercial interest shall make a profit-sharing agreement in relation to the profits derived from the use of such local domestic plant variety' (Article 48).

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188 It is unclear how this type of ownership is to be established in the absence of a certificate of registration.

189 'Small farmer' is, according to Article 2, 'a farmer whose farming operations do not exceed the size of holding as prescribed by the Minister'. This has been determined to be a holding <0.2 ha (Gazette – October 20, 2008).

190 See, e.g., Pawarit Lertdhamtewe, 'Thailand's sui generis system of plant variety protection' (2014), QUNO, available at http://www.quno.org/resource/2014/1/developing-country-sui-generis-options-plant-variety-protection, 3.

191 Article 47: 'When registration has been made for the protection of a local domestic plant variety of any locality, that locality shall have the exclusive right to develop, study, conduct an experiment or research in, produce, sell, export or distribute by any means the propagating material thereof…'

– General domestic and wild varieties are not eligible for exclusive rights but subject to a benefit-sharing mechanism only. Permission by the government is required in order to access these varieties for variety development, education, research or commercial purposes:

> A person who collects, procures or gathers general domestic plant varieties, wild plant varieties or any part of such plant varieties for the purposes of variety development, education, experiment or research for commercial interest shall obtain permission from the competent official and make a profit-sharing agreement under which the income accruing therefrom shall be remitted to the Plant Varieties Protection Fund (Article 52).

The Thai PVP Act hence relies quite heavily on benefit-sharing mechanisms rather than on exclusive rights. Thailand 'has sought to provide other forms of incentives to breeders of domestic and farmers' varieties (i.e., it is closer to a liability regime than a property rights regime)'.[192]

3.5 Conclusions

The 1991 revision to the UPOV Convention significantly expanded and strengthened plant breeders' rights. UPOV 1991 provides a platform for harmonizing PVP on the basis of standards that essentially respond to conditions prevailing in developed countries. Moreover, it does not contain any limitation to the further expansion of the scope of exclusive rights.

The UPOV Convention's 'one size fits all' model ignores the agricultural profiles and the characteristics of the seed supply systems in developing countries, particularly the needs of small-scale farmers regarding access to good-quality yet affordable plant materials. The implementation of the Convention may, in particular, narrow down genetic diversity in the fields and suppress farmers' traditional practices of saving and exchanging plant materials. These activities are crucial to preserving a diversified supply of seeds adapted to local conditions and a changing environment.

As discussed in Chapter 2, countries, even those that are WTO members, are not obliged to join UPOV nor to otherwise apply the standards set out by the UPOV Convention. They can implement – as examined in Chapter 4 – sui generis options more suitable to their needs, supportive of small-scale farmers – who account for the largest part of food production and employment in many developing countries – and consistent with their policies on agricultural development and food security.

[192] D. Robinson, *Exploring Components and Elements of Sui Generis Systems for Plant Variety Protection and Traditional Knowledge in Asia* (International Centre for Trade and Sustainable Development 2007), 19.

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CHAPTER 4

An Alternative Model: Proposals for a Sui Generis Regime

MODEL provisions for a sui generis regime are presented and explained in this chapter. In drafting such provisions, a thorough analysis has been conducted of PVP legislations – particularly the sui generis regimes described in Chapter 3 and the legislations of other developing countries (such as the Philippines,[193] Egypt,[194] Zambia,[195] Indonesia[196] and Ethiopia[197]) which include some sui generis elements, especially with regard to the rights conferred to farmers – that depart from the UPOV model.

The objective here is not to draw up a full-fledged model law but to provide some of the key elements that a sui generis regime may contain. The model provisions primarily deal with substantive issues that are essential to designing a sui generis regime and are accompanied by short explanatory notes. For purposes of completeness, some provisions that are standard in PVP legislation are included. Some procedural aspects are also considered, but the model provisions do not address issues concerning legal standing, provisional injunctions, damages in case of infringement and other issues concerning the exercise of rights. All these issues need to be treated in the context of the national law, consistent with the relevant law principles, legal traditions and practices including, where applicable, customary law.

The model provisions are mainly aimed at countries that are bound to comply with the TRIPS Agreement's obligation regarding the protection of plant varieties. LDCs can, as mentioned above, delay the introduction of PVP until the end of the transitional period and any subsequent renewals thereof. There are, in fact, good reasons – as suggested by the wording of Article 66.1 of the TRIPS Agreement[198] – for these countries to rely on free access to plant materials and technologies until they cease to be an LDC.

Governments and other stakeholders intending to rely on the proposed model provisions would need to adapt them to the particular circumstances and needs of their respective countries. Importantly, a sui generis regime on PVP – like any other component of a national intellectual property system – should not be designed and implemented in isolation, but as an integral part of national policies such as those relating to agricultural and rural development, protection of indigenous and local communities' knowledge, commercialization of seeds, food security, poverty alleviation and protection of the environment.

The objectives of PVP regimes may vary in different countries. They may include, for instance, complying with the TRIPS requirements in a manner that is supportive of other international legal obligations (e.g., CBD, ITPGRFA), balancing the interests of commercial breeders and farmers, 'encouraging biodiversity', promoting access to plant genetic resources on fair and equitable terms, recognizing Farmers' Rights and protecting the traditional knowledge of indigenous communities.[199]

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193 Plant Variety Protection Act of 2002; Republic Act 9168.

194 Law No. 82 of 2002, Book Four.

195 Plant Breeder's Rights Act 2007.

196 Law No. 29 of 2000 on Plant Variety Protection.

197 Proclamation No. 481/2006, A Proclamation to provide for Plant Breeders' Right.

198 'In view of the special needs and requirements of least-developed country Members, their economic, financial and administrative constraints, and their need for flexibility to create a viable technological base, such Members shall not be required to apply the provisions of this Agreement…'

199 Helfer, op. cit., 71.

The model provisions presented here have been developed with a number of objectives in view, such as the need to ensure:

- a right balance between breeders' rights and those of farmers and the society at large;
- the recognition and implementation of Farmers' Rights and that the PVP regime supports both the formal seed system as well as the informal seed sector,[200] particularly smallholder farmers;
- that developments made by public research and breeding institutions as well as farmers are not misappropriated;
- that breeders recoup their investments in the development of new varieties without undermining Farmers' Rights, societal welfare and the environment;
- the facilitated or increased diffusion of new varieties suitable to the conditions in the country, taking into particular account the situation and needs of small-scale farmers;
- that national PVP regimes are adapted to the agricultural profile of the respective countries, and that they are consistent with and supportive of policies on conservation and sustainable use of plant biodiversity for food and agriculture;
- the preservation of traditional knowledge associated with genetic resources and the traditional farming practices of saving, using, exchanging and selling seeds/propagating material, having in view the importance of ensuring the livelihood of farming communities, the continuous adaptation of seeds/propagating material to the evolution of agricultural ecosystems, and food security;
- that the national PVP regimes respect, protect and fulfil states' obligations regarding the right to food,[201] the right to enjoy the benefits of scientific progress and its application,[202] and the rights of indigenous peoples;
- that such regimes are supportive of and do not counter the objectives and the obligations under the CBD, the Nagoya Protocol and the ITPGRFA.

The proposed sui generis regime is articulated on the basis of three categories of plant varieties: (i) new uniform plant varieties; (ii) new farmer and other heterogeneous varieties; and (iii) traditional farmers' varieties.

New uniform plant varieties are covered by a regime that approximates UPOV 1978, whereunder the NDUS requirements are applicable and breeders may obtain an exclusive right upon registration. This means that once protection is granted, and subject to some exceptions, the commercial use of the propagating material of the new uniform plant variety would require prior authorization by the right holder.

New farmer and other heterogeneous varieties should also be registered but different requirements would apply (novelty, distinctness and identifiability). Right holders would have a remuneration right only (not 'exclusive rights'), that is, the proposed regime would not restrict the commercial exploitation of the propagating materials of those varieties; however, it will require payment of remuneration (to individual farmers, farming communities or breeders that registered that variety) when such exploitation takes place. Thus, the regime essentially aims at preventing the free misappropriation of varieties developed or evolved by farmers and farmers' communities, as well as of other heterogeneous varieties developed by breeders, including in public research institutions.

With regard to the last category of varieties, *traditional farmers' varieties*, a remuneration right is also proposed in case of commercial exploitation of the propagating material of traditional varieties, but the remuneration would be payable to a Seed Fund. The only requirement for protection to be granted is the 'identifiability' of a variety, and registration would not be needed.

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200 As mentioned above, the need to support the informal seed system in addition to the formal seed system has been recognized in the Voluntary Guide for National Seed Policy Formulation, which was endorsed by the Fifteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture in January 2015. See http://www.fao.org/3/a-mm546e.pdf.

201 See Article 11.1 and 11.2 of the International Covenant on Economic, Social and Cultural Rights (ICESCR).

202 See Article 15.1(b) of the International Covenant on Economic, Social and Cultural Rights (ICESCR).

Importantly, in recognition of the crucial role that small farmers play in the production of food in developing countries, the proposed sui generis regime exempts them from any obligation in connection with the categories of plant varieties mentioned, thereby fully safeguarding the right of small-scale farmers to save, use, exchange and sell seeds/propagating material. Other exceptions consistent with the concept of Farmers' Rights are also contemplated for other farmers.

The proposed sui generis regime also suggests the establishment of a Seed Fund which will collect remuneration from the commercial exploitation of traditional farmers' varieties and a benefit-sharing contribution when a new uniform plant variety is registered. Income from the Seed Fund will be used to support the conservation and sustainable use of plant genetic resources, particularly on-farm conservation and community seed banks, as well as to implement benefit sharing to relevant farmers and farming communities.

The recognition of these three categories of varieties is an attempt to create an equitable system that overcomes the dichotomization between breeding and farming inherent to the UPOV model. It would also allow countries to establish a system that is consistent with and supports the implementation of the CBD and the ITPGRFA.

Before entering into the analysis of possible provisions to implement the system described above, it is important to stress that no intellectual property regime is a magic tool that will *per se* promote investment or innovation in plant breeding and bring about food security. Any such regime is strongly dependent on the context where it applies and cannot substitute for measures that governments need to adopt to support plant breeding. Public investment in breeding, including the dynamic management of cultivated biodiversity and participatory breeding, is and will continue to be a necessity regardless of the adoption of any PVP regime. It would be absolutely wrong to believe that by merely enacting and enforcing a PVP regime, the state has ensured an optimal level of private and public investment in breeding and as such may cease or reduce the required public support, in particular, to address the needs of poor farmers.

MODEL PROVISIONS

4.1 Categories of protected varieties

This law applies to:

(a) *New uniform plant varieties* developed by a breeder or group of breeders;

(b) *New farmer and other heterogeneous varieties*. These consist of
(i) *New farmers' varieties* cultivated and bred by a farmer or a community of farmers in the fields;
(ii) *Other heterogeneous varieties* developed by other breeder or group of breeders;

(c) *Traditional farmers' varieties* which have been traditionally cultivated and evolved by the farmers in the fields, or which are a wild relative or landrace of a variety which is of common knowledge to farmers.

While a PVP regime may be limited to protection of varieties that comply with the NDUS requirements, it may be expanded so as to cover other, non-uniform varieties, including those cultivated and developed by farmers. There are different reasons that may justify this extended protection, such as:

1) bringing equity into the relations between farmers and commercial breeders through the recognition of breeding undertaken by farmers/communities;
2) promoting plant genetic diversity through the conservation and sustainable use of farmers' varieties by raising 'the profile of that knowledge and encourag[ing] respect for it both inside and outside the knowledge holding communities'[203] and by providing a remuneration right/benefit sharing. This is also a way of facilitating implementation of Articles 6 and 9 of the ITPGRFA;

[203] Crucible Group II, *Seeding Solutions, Volume 2: Options for National Laws Governing Control over Genetic Resources and Biological Innovations* (2001), International Development Research Centre, 68-69.

3) curbing the misappropriation, without benefit sharing, of varieties bred by farmers and farmers' communities;
4) encouraging the diffusion of varieties bred by farmers/communities;
5) addressing the farmers' need to have access to varieties better adapted to climate and environmental changes;
6) promoting biodiversity in the fields through the recognition of a set of (non-exclusive) rights in relation to heterogeneous varieties developed by commercial breeders and research institutions;
7) ensuring that plant genetic resources from various sources, including private breeding, are free for further breeding without restriction.

Accordingly, the proposed sui generis regime would cover three different categories of varieties, the protection of which would generate different sets of rights.

New uniform plant varieties would cover new uniform varieties developed by breeders, private companies and other entities (e.g., agricultural research institutions) with the intent of commercializing them via licensing or multiplication and sale. As indicated below, the proposed sui generis regime would apply the NDUS requirements to these varieties, despite the shortcomings noted in Chapter 3 in respect of the UPOV-type requirements of protection (NDUS). The reason is that the negative impact that the uniformity and stability requirements may have on genetic diversity could be neutralized, at least to some extent, by the recognition and promotion of heterogeneous varieties, including farmers' varieties.

The proposed model provisions do not refer to the concept of 'essentially derived varieties'. As noted in Chapter 3, this concept is problematic and, although it may contribute to avoiding 'cosmetic' breeding, its application may be particularly cumbersome in developing countries.

The purpose of the category of *new farmer and other heterogeneous varieties* is to capture varieties that do not meet all the NDUS requirements but are, however, new, distinct and identifiable, as discussed below.

This category extends to new farmers' varieties that are heterogeneous and developed by farmers as part of their agricultural practices. This is to recognize the role of farmers as breeders. However, the protection conferred would essentially be 'defensive', in the sense that it would aim at avoiding the misappropriation by commercial breeders of new farmers' varieties and operationalizing a system of compensation to the farmer or community of farmers in cases where the new farmers' varieties are multiplied for commercial purposes.

This category also includes other varieties that are non-uniform, the aim being to contribute to the conservation and promotion of biodiversity, which, as mentioned, is undermined by the requirement of uniformity applied under PVP laws that follow the UPOV model. The rights conferred would be the same as those granted in relation to new farmers' varieties, that is, the regime would not create exclusive rights but a remuneration right. This may allow, inter alia, generation of a monetary income in cases where non-uniform varieties released by public research institutions are commercialized by third parties.

The category of *traditional farmers' varieties* would include farmers' varieties that are of common knowledge to farmers.[204] The purpose of recognizing this category is also defensive: to ensure fair and equitable benefit sharing where the propagating material of a traditional farmers' variety is commercialized by a third party. The traditional farmers' varieties need not be new but should be identifiable. This category includes new farmers' varieties whose term of protection has expired.

It is important to note that the adoption of a legal regime to protect farmers' varieties will not achieve its intended objectives if other complementary measures are not adopted and effectively implemented by governments. Such measures may include a wide range of both indirect and direct policies, such as state

[204] This concept is based on Article 2(l) of the Indian PPVFR Act.

programmes for the acquisition of stocks of foodstuff with the purpose of both supporting low-income producers and feeding the poor,[205] and assistance to farmers[206] in asserting their rights, particularly in cases of misappropriation. Non-governmental organizations (NGOs) have a crucial role in providing this assistance, as in many countries they would be well placed to work with and support farmers in exercising their rights.

4.2 Requirements for protection

(1) In order to obtain protection under this law
  (a) *New uniform varieties* must be (i) new, (ii) distinct, (iii) uniform and (iv) stable.
  (b) *New farmer and other heterogeneous varieties* must be (i) new, (ii) distinct and (iii) identifiable.
  (c) *Traditional farmers' varieties* must be identifiable.

(2) A variety shall be deemed to be new if, at the date of filing of the application for registration, the propagating or harvested material of the variety has not been sold or otherwise disposed of to others, by or with the consent of the breeder(s) or farmer(s), for purposes of exploitation of the variety:
  (a) in the territory of [country] earlier than one year before the filing date of the application, and
  (b) in other countries earlier than four years or, in the case of trees or of vines, earlier than six years before the filing date of the application.[207]

(3) A variety shall be deemed to be distinct if it is clearly distinguishable by one or more important characteristics from any other variety whose existence is a matter of common knowledge at the time of the filing of the application. Common knowledge may be established inter alia by reference to various factors such as: cultivation or marketing already in progress, entry in an official register of varieties already made or in the course of being made, inclusion in a reference collection, or precise description in a publication. The characteristics which permit a variety to be defined and distinguished must be capable of precise recognition and description.[208]

(4) A variety shall be deemed to be uniform if, subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics.[209]

(5) A variety shall be deemed to be stable if its relevant characteristics remain unchanged after repeated propagation or, in the case of a particular cycle of propagation, at the end of each such cycle.[210]

(6) A plant variety shall be deemed to be identifiable if—
  (i) it can be distinguished from any other plant grouping by the expression of one characteristic and that characteristic is traceable within individual plants or within and across a group of plants; and
  (ii) such characteristic can be identified by any person skilled in the relevant art.[211]

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[205] The implications of implementing these programmes under the WTO Agreement on Agriculture were one of the controversial issues discussed at the 2013 Bali WTO Ministerial Conference, which adopted an 'interim' solution on the subject. See, e.g., Carlos Correa, 'Subsidies and food security in WTO: a permanent solution is still pending' (2014), South Centre.

[206] See, e.g., Article 41 of the Indian PPVFR Act.

[207] Based on Article 6 of UPOV 1991.

[208] See Article 6(a) of UPOV 1978.

[209] See Article 8 of UPOV 1991.

[210] See Article 9 of UPOV 1991.

[211] See Article 14(3)(e) of the Malaysian Protection of New Plant Varieties Act 2004.

As mentioned, a sui generis regime may adopt the NDUS requirements or a different set of them. It may also apply different requirements to different categories of varieties, as proposed in this model provision.

a) New uniform varieties

New uniform varieties would be subject to the NDUS requirements.

The *novelty* requirement has become a generally accepted standard for PVP. Under this provision, commercialization or other disposal of a variety (even without commercial intent) would destroy novelty. The proposed model provision exempts 'traditional farmers' varieties' from compliance with this requirement, as this category is suggested to cover extant (existing) varieties which may have been cultivated and conserved by farmers for periods longer than those admissible under the standard of novelty as defined.

The requirement of *distinctness*, first introduced by the US Plant Patent Act of 1930,[212] aims to ensure that a variety receives protection when it may be distinguished from the varieties that are in the 'common knowledge'. The distinction may be based, e.g., on quantitative differences (for instance, plant or seed size), colour, yield or disease resistance. Some PVP laws only require the presence of one or more characteristics that clearly distinguish the variety, without qualifying how significant the differences should be, thereby applying a low threshold for protection. In line with UPOV1961/1978 and the legislation that implemented it, that requirement may be qualified by the *importance* of the characteristics that make a new variety distinct from those which are of common knowledge. If this approach were followed, the registration of a new variety may be made conditional upon the description of at least one major trait or property that distinguishes it from those in the common knowledge, thereby promoting a certain level of innovation in plant breeding and excluding from protection varieties that incorporate merely 'cosmetic' changes to existing varieties.

Distinctness is normally assessed on the basis of phenotypic characteristics, but nothing excludes the use of genotypic indicators. One problem to be addressed, however, is that

> distinctness assessments are becoming even more subtle as reference collections become larger and as marketplace pressures drive breeders towards incorporating very similar traits in phenotypically similar plants that may be genotypically quite different.[213]

Commercial varieties are bred with the deliberate aim of obtaining a high degree of *uniformity* in order to respond to certain market demands and/or to comply with the seed certification or PVP requirements.

Stability, which is a key condition under the UPOV regime, means that the plant variety obtained in the course of various cycles of planting continues to produce plants with the same characteristics obtainable with the original propagating material. Generally, when uniformity is established, the stability requirement is deemed to be met as well.[214] Like in the case of uniformity, stability may be measured differently according to the adopted criteria. A certain level of variability may be allowed (or required) on the population level, for instance by testing the presence of some important traits (e.g., yield) through several generations.[215]

b) New farmer and other heterogeneous varieties

The NDUS requirements are unsuitable to farmer and other heterogeneous varieties. The main reason is that farmers' breeding practices generally do not aim at ensuring uniformity and stability. Farmers' varieties normally involve a diversity of genotypes, and are less uniform and stable than commercial varieties. Small-scale farmers normally do not seek to increase uniformity through selection, as this would pose a high risk;

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212 Janis and Kesan, op. cit., 741.
213 See Janis and Smith, op. cit., 27.
214 Id.
215 Id.

variations within one single farmer's variety may be important for responding to particular growing conditions, biological or abiotic stresses.[216]

Farmers' practices are crucial for the conservation of diversity in the fields. This is essential for a sustainable and resilient agriculture and for food security, particularly given the challenges of adapting to climate change. As a result of the different objectives of commercial and farmers' breeding, the outcomes of the latter fall outside the UPOV type of protection, which focuses instead on responding to certain market demands.

The proposed model provision suggests the application of the requirements of novelty and distinctness to new farmer and other heterogeneous varieties, as defined above, but replacing the uniformity and stability requirements with 'identifiability'.

The concept of *identifiability* can be understood as requiring that each generation of a plant variety be identifiable as the same distinct plant variety, without necessarily being uniform in all of its characteristics.[217] It has been adopted by the Malaysian sui generis regime in relation to a plant variety that 'is bred, or discovered and developed by a farmer, local community or indigenous people' (Section 14(2)); and compliance with the 'identifiability' requirement would require demonstrating that there is a group of plants that perform in a certain way.[218]

The adoption of the identifiability requirement (along with novelty and distinctness) was one of the options recommended by the Crucible Group[219] to overcome the problem posed by the lack of uniformity of farmers' varieties. The Group noted that

> [t]his element replaces the relatively strict requirements of uniformity and stability with the looser condition of 'distinctness and identifiability' (DI) ... [D]espite not satisfying the UPOV standards, the criterion of identifiability may well satisfy TRIPs [sic] Article 27.3(b), which includes no obligation on WTO member countries to follow the UPOV model or to become members of UPOV.[220]

The African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources (OAU Model Law)[221] also proposed to grant protection to 'a variety with specific attributes identified by a community' (Article 25(2)).

The same requirements for protection would apply in relation to breeders' varieties developed without having uniformity/stability as a target. 'Other heterogeneous varieties' share the characteristic of non-uniformity with new farmers' varieties. The current UPOV model excludes such heterogeneous varieties from protection. The sui generis regime proposed here is, in this sense, more encompassing than the UPOV-type regimes, as it aims at promoting biodiversity in the fields.

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216 See, e.g., R. Salazar, N. Louwaars and B. Visser, 'Protecting Farmers' New Varieties: New Approaches to Rights on Collective Innovations in Plant Genetic Resources' (2007), *World Development*, 35(9), 1523. See also Prabhash Ranjan, 'Recent Developments in India's Plant Variety Protection, Seed Regulation and Linkages with UPOV's Proposed Membership' (2009), *Journal of World Intellectual Property*, 12(3), 219-243. Available at SSRN: <http://ssrn.com/abstract=1696522>.

217 See Leskien and Flitner, op. cit., 53.

218 Personal communication from Lim Li Ching of June 2, 2014 based on an interview with staff of the Malaysian PVP office (on file with the author).

219 The Crucible Group was an interdisciplinary gathering of experts who included grassroots organizations working with small-scale or subsistence farmers, trade diplomats, agricultural research scientists, science managers, intellectual property specialists, and agricultural policy analysts from both developed and developing countries. The Group met for the first time in 1993 to examine questions of genetic resources control and management. See, e.g., *Seeding Solutions: the Crucible projects* (2000), IDRC, available at http://idl-bnc.idrc.ca/dspace/bitstream/10625/29938/1/117465.pdf.

220 Crucible Group II, op. cit., 148.

221 African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources <http://www.cbd.int/doc/measures/abs/msr-abs-oau-en.pdf>.

c) Traditional farmers' varieties

The requirement of identifiability would also be applicable in relation to traditional farmers' varieties, which are not new. It would be impossible to apply the criterion of distinctness, since such varieties are in use and part of the common knowledge.

Since it is often difficult or impossible to establish the community that developed a traditional variety, the regime proposed here suggests the creation of a Seed Fund to collect remuneration in cases of commercial use of such varieties.

In addition to the income that could be generated by collecting this remuneration, it is proposed that a mandatory contribution to the Seed Fund be made whenever a new uniform variety is registered. Income from the Seed Fund may be used to make benefit-sharing payments where a new farmers' variety or traditional farmers' variety as defined by this law has been used as a donor of traits/genes in the development of the registered new uniform plant variety (see the section on 'Benefit-sharing contribution' below).

4.3 Scope of protection

(1) The protection conferred under this law to new uniform plant varieties shall be granted to at least five genera or species, within one year of its entry into force, 10 within three years, 18 within six years and 24 within eight years. The protection may be limited to varieties with a particular manner of reproduction or multiplication, or certain end-use within a particular genus or species. The competent authority may, taking account of special economic or ecological conditions or of special difficulties in granting protection, decide to reduce the minimum numbers or to extend the periods referred to in this paragraph, or to do both.[222]

(2) A new uniform plant variety, or new farmer and other heterogeneous variety that has merely been discovered is not protectable.

(3) The rights conferred under this law in relation to new farmer and other heterogeneous varieties and traditional farmers' varieties shall apply to all genera or species.

Paragraph (1) of this provision draws from Article 2(2) and Article 4(3), (4) and (5) of UPOV 1978. As noted in Chapter 3, UPOV 1978 is flexible in relation to the scope of the protected varieties, aiming at a *progressive* extension of the protection, but with limited obligations on contracting parties, including the possibility to reduce the scope of protection where special economic, ecological conditions or difficulties prevail. However, countries could opt for a narrower scope of protection than that suggested above.

One possibility offered by the proposed provision – admitted also by UPOV 1978 – is to limit the varieties protected *within* a certain genus or species, thereby allowing for a differentiation in treatment, for instance, based on whether the end-use of the variety is food or non-food.

One important question is whether limitation of the protection to a certain number of plant varieties would be, in the case of countries subject to the TRIPS Agreement, compatible with the obligation set out by Article 27.3(b) of the Agreement. While the absence of a specific reference to this issue may be interpreted as indicating that protection for all plant varieties is required by the Agreement,[223] it is common practice for national PVP laws to limit protection to a list of genera and species.[224] No member has been challenged under the WTO rules on this ground. In India, for instance, the government is bound to notify through the

[222] Based on Articles 4 and 2(2) of UPOV 1978.

[223] See, e.g., Helfer, op. cit., 56.

[224] See, e.g., UPOV, 'List of the Taxa Protected by the Members of the Union' (2013), C/47/6, document prepared by the Office of the Union.

Official Gazette the genera or species for the purpose of registration of varieties (other than extant varieties and farmers' varieties) and may delete any genera or species in the public interest.[225] Notably, UPOV 1978, which is in force in many countries (and was in force in even more countries when the TRIPS Agreement was adopted), does not require protection for all genera/species.

In the debates around the review of Article 27.3(b) different views were expressed on this issue:

> In regard to the subject-matter that should be protected, the view has been expressed that such subject matter should be clearly defined and for a sui generis system to be considered effective, protection should apply to all plant varieties throughout the plant kingdom. It has been pointed out that, unlike the English and French versions of the text of the TRIPS Agreement, the Spanish version, which is as authentic as the English and French versions, makes it clear that all plant varieties are to be protected. In response, the point has been made that Article 27.3(b) only speaks of a sui generis system without providing specific details as to the plant varieties that should be protected. Further, it has been pointed out that some existing sui generis systems, such as in the UPOV, which appear to be considered effective models given their long-standing use, do not require protection of the entire plant kingdom.[226]

The opinions reflected above point to a major divergence between developed[227] and developing countries[228] on this issue. However, the UPOV 1978 regime as well as the states' practices seem to support the possibility of limiting protection of new uniform varieties to certain genera/species. This would also be in line with the rationale of PVP, which only makes sense in a particular country for certain crops. As stated in a report produced by the UPOV Secretariat:

> In an effective system of PVP the development of new varieties of plants will be encouraged where there is commercial viability, but in cases where there is no existing, or potential, commercial market for varieties, the presence of a PVP system should not be expected to encourage the development of new varieties.[229]

Further, the law can make it clear – as proposed in paragraph (2) – that merely discovered varieties, such as mutants, are not protectable. There is no sound justification for granting PVP over materials that are simply found, and on which no further breeding or only a simple development (homogenization and stabilization of a variety) has taken place.

Finally, paragraph (3) clarifies that in the case of varieties that are non-uniform (for the category of new farmer and other heterogeneous varieties as well as traditional farmers' varieties), the coverage includes all genera/species. The reason for this differentiation in treatment is that the protection for such varieties is essentially defensive, that is, its purpose is to prevent misappropriation. The granted protection would be based on a remuneration right only; no exclusive rights could be exercised in respect of such varieties.

4.4 Exclusions from protection

> The protection of a variety under this law shall be refused in cases where the prevention of the commercial exploitation of such variety is necessary to protect the public order or public morality or human, animal and plant life and health or to avoid a serious prejudice to the farming system or the environment,[230] including when a variety may have harmful effects on biodiversity or food security.

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225 See Article 29(2) and (4) of the PPVFR Act.

226 WTO, 'Review of the Provisions of Article 27.3(b). Summary of Issues Raised and Points Made', Note by the Secretariat, IP/C/W/369/Rev.1, March 9, 2006, 17.

227 See European Communities, IP/C/W/383, para. 77.

228 See the submissions by Uruguay, IP/C/M/28, para. 132; Peru, IP/C/M/32, para. 128; India, IP/C/M/29, para. 162; and Thailand, IP/C/M/25, para. 78.

229 UPOV, 'UPOV Report on the Impact of Plant Variety Protection' (2005), 11, available at http://www.upov.int/export/sites/upov/about/en/pdf/353_upov_report.pdf.

230 See Article 27.2 of the TRIPS Agreement and Article 29 of the Indian PPVFR Act.

A sui generis regime may provide for certain exclusions from the scope of protection. Several countries have similar exclusions in their sui generis legislation (e.g., Zambia,[231] India,[232] Zimbabwe,[233] Indonesia[234]).

Such exclusions may be important to protect farming systems or the environment, for instance, when the diffusion of a particular variety (which would be otherwise protectable) would have detrimental effects. One example is provided by Article 29(3) of the Indian PPVFR Act (concerning 'Exclusion of certain varieties') in relation to the so-called 'genetic use restriction technology' or 'terminator gene' which prevents germination of saved seeds.[235]

The model provision spells out various reasons that may be invoked by the competent authority to refuse the registration of a plant variety. Although seed laws (that is, the laws that regulate the production and commercialization of seeds) may contain similar prohibitions, the coherence of the legal system will be enhanced if the competent authority is empowered to refuse the grant of PVP rights in the first place.

4.5 Registration

(1) In order to obtain the protection established by this law, the new uniform plant variety, the new farmer and other heterogeneous variety must be registered [in accordance with the applicable regulations].

(2) An application for registration of a variety shall include:

(a) the pedigree information and associated passport data, as available to the applicant, on the lines from which the variety has been derived, along with all such information available to the applicant relating to the contribution of any farmer, community, institution or organization upon which the applicant relied to derive the new variety;[236]
(b) evidence, as required by the competent authority, that the genetic material or parental material used for breeding, evolving or developing the variety has been lawfully acquired[237] and that, where appropriate, the applicant has complied with prior informed consent and benefit-sharing requirements;
(c) samples, as determined by the regulations, of the variety. The samples will be conserved by [the competent authority] during the term of protection and thereafter. Upon request, any interested party may at any time obtain access to the deposited samples.

(3) The information and evidence submitted to comply with paragraphs (2)(a) and (b) shall be made publicly accessible by the competent authority.

(4) An application shall not be processed if the required information and samples are not supplied.

231 Section 29(7) of the Zambian Plant Breeder's Rights Act 2007.
232 Article 29 of the Indian PPVFR Act.
233 Section 10(d) of the Zimbabwean Plant Breeders Rights Act, Chapter 18:16.
234 See also Article 4 of the Indonesian Plant Variety Protection law No. 29 of 2000: 'Varieties that cannot be given Plant Variety Protection are those that are used for purposes which conflict with prevailing laws, social order, ethics/morality, religious norms, health and the conservation of the environment.'
235 In 2000, the fifth meeting of the Conference of the Parties (COP 5) to the CBD recommended a de facto moratorium on field-testing and commercial sale of terminator seeds; the moratorium was reaffirmed and the language strengthened in March 2006 at COP 8.
236 See Article 18(1)(e) of the Indian PPVFR Act.
237 The proposed model provision is also aimed at covering cases where materials have been obtained from the wild, and not only where they have been acquired from a farmer, community or an institution different from the applicant.

The protection conferred to new uniform varieties, new farmer and other heterogeneous varieties is made contingent on the registration of the variety, in accordance with regulations that should be enacted to that effect, taking into account the particular institutional setting and procedures applicable in each country. Although farmers may find it difficult to comply with registration procedures, it does not seem viable to establish remuneration rights for specific farmers or farming communities (as proposed below) in the absence of a registration system. The same logic applies to requiring registration of new heterogeneous varieties. Such a registration system may also provide some legal certainty to third parties regarding their obligations. The role of NGOs in assisting the farmers to register their varieties and assert their rights may be crucial for the operation of a retributive system. Governments should adopt simple and affordable procedures,[238] and assist farmers in complying with them. For example, India charges no fees for the registration of farmers' varieties.[239]

Registration is not suggested with regard to traditional farmers' varieties as it would be impracticable to require the registration of all such varieties. In any case, NGO and governmental support will be indispensable to realizing rights in relation to traditional farmers' varieties.

Sui generis regimes may include obligations on applicants or right holders that are not required under UPOV-type laws. Although the disclosure obligation (see Chapter 2) has mainly been discussed in the context of patent law, PVP laws should equally implement it,[240] *mutatis mutandis,* to monitor and enhance transparency with regard to utilization of plant genetic resources and if misappropriation of genetic resources is to be dealt with or avoided.

Thus, in India, a breeder or other person making an application for registration of any variety must disclose the passport data of the parental lines from which the variety is derived, the contribution of any farmer/community in developing the variety (Article 18(1)(e) of the PPVFR Act) as well as information regarding the use of genetic material conserved by any tribal or rural families in the breeding or development of such a variety (Article 40(1)).[241] In Malaysia, applications for the registration of a new variety need to provide information relating to the source of the genetic material, and should be 'accompanied with the prior written consent of the authority representing the local community or the indigenous people in cases where the plant variety is developed from traditional varieties', and need to be 'supported by documents relating to the compliance of any law regulating access to genetic or biological resources' (Section 12(1)(e), (f), (g) of the Protection of New Plant Varieties Act). The Thai PVP Act makes the registration of a variety conditional upon the disclosure of the origin of either the new plant variety or the genetic materials used in the breeding of that variety (Section 19(3)). In Egypt, the breeder is obliged to disclose the genetic resource from which the new plant variety has been derived; prove that it was obtained lawfully consistent with the Egyptian law; and disclose traditional knowledge and experience belonging to local communities upon which the breeder relied to derive the new plant variety.[242]

The proposed model provision stipulates an obligation to disclose information on the source of a plant variety for which protection is sought as well as to provide evidence that the material used for breeding has been lawfully obtained. Where appropriate, this would require the applicant to show that the prior informed consent of the traditional farmers/communities who have developed/conserved the materials has been obtained and evidence of compliance with benefit-sharing requirements. The disclosure-of-origin obligation would facilitate identification of farmers and farming communities that should be entitled to benefit-sharing payments by the Seed Fund (see section below on 'Benefit-sharing contribution').

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238 For instance, no legal assistance or representation should be required for submitting an application.

239 See http://plantauthority.gov.in/pdf/FAQ_New.pdf.

240 As noted in Chapter 2, this requirement has been deemed incompatible with the UPOV Convention.

241 The Indian PPVFR Act requires information about the origin of the variety including geographical source and farmer/village/community/institution/organization (PPVFR Regulations, Form 1, Part 10(b)).

242 See Mohamed Salem Abou El Farag Balat, 'Intellectual Property Rights and Plant Varieties Protection in Egypt: The New Sui Generis Regime, Public Interest and the TRIPs Agreement' (2006), *Journal of International Biotechnology Law*, 3(3) <http://www.degruyter.com/view/j/jibl.2006.3.issue-3/jibl.2006.015/jibl.2006.015.xml>, 121.

Plant varieties, even if subject to specific rights under a sui generis regime, constitute the pool on which breeders and farmers rely in order to improve yields, adapt to changing conditions or attain other targets. Thus the model provision requires the submission, with the application, of samples of the variety and their conservation by the competent authority even after the protection has expired, so as to ensure their continuous availability for multiplication or further research and breeding.

The information and samples submitted with an application for registration should be publicly available, as proposed in the model provision above.[243]

It is important to note that the public availability of information and samples through the operation of seed certification and marketing laws is no substitute for a similar solution under PVP regimes, since varieties registered under the latter may not have been submitted for marketing approval under the applicable seeds legislation. In addition, the information required by seed certification and marketing laws may not include elements required under the PVP legislation, for instance, in relation to the source of the variety and traditional knowledge relied upon by the applicant. Moreover, the reception of PVP applications by the competent authority is an important checkpoint for purposes of verifying compliance with the CBD and the Nagoya Protocol.

4.6 Opposition

(1) Applications for registration of new uniform varieties, new farmer and other heterogeneous varieties shall be published in accordance with the regulations. Any person may, before a decision to grant protection has been made by the authority, file an opposition to such grant on one or any combination of the following grounds:

  (a) that the person opposing the application is entitled to the breeder's right as against the applicant;
  (b) that the application does not comply with the requirements of this law;
  (c) that the variety for which an application has been filed is excluded from protection; or
  (d) that the commercialization of the variety will be contrary to the public interest.[244]

(2) An opposition may also be filed, on the grounds provided for in paragraph (1), within 12 months from the date of publication of the grant of protection to a new uniform variety or a new farmer and other heterogeneous variety.

(3) The person opposing the application or the grant of protection will have the right to submit evidence, be informed of the arguments presented by the applicant or the right holder in response to the opposition, and be heard by the competent authority before a decision on the opposition is made.

The proposed provision incorporates pre-grant (paragraph (1)) and post-grant (paragraph (2)) oppositions. Pre- and post-grant oppositions may provide the competent authority with important information to make the right decisions regarding the protection of new plant varieties. This may avoid the grant of unwarranted rights and the need for third parties to litigate in courts for a long time and at a high cost. Until a conferred right is revoked, it is presumed to be valid and may block legitimate competition. Therefore, rather than correcting wrong decisions, the best policy is to ensure the highest possible quality of examination of filed applications. The right to submit an opposition would be open to any person, including individual farmers or farmers' organizations, non-governmental organizations, research institutions and government agencies.

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[243] In this regard, recent attempts to introduce confidentiality in PVP regimes in relation to information and samples submitted to the competent authorities are a matter of concern. See, e.g., Article 15(2) of the draft ARIPO Legal Framework for the Protection of New Varieties of Plants; UPOV, 'Matters Raised by the International Seed Federation (ISF)', document prepared by the Office of the Union, CAJ/69/10, February 27, 2014, available at http://www.upov.int/edocs/mdocs/upov/en/caj_69/caj_69_10.pdf.

[244] See Article 21(3) of the Indian PPVFR Act.

4.7 Rights conferred

The following rights shall be conferred under this law:

(1) *New uniform plant varieties*

The following acts shall require the authorization of the right holder in respect of the propagating material of a uniform plant variety that has been registered in accordance with the established procedures:

(i) the production for purposes of commercial marketing;
(ii) the offering for sale;
(iii) the marketing.[245]

(2) *New farmer and other heterogeneous varieties*

(a) Any person shall be free to undertake the acts referred to in paragraph (1)(i)-(iii) in respect of propagating material of a registered new farmer and other heterogeneous variety, provided that remuneration shall be paid to the farmer, farmers' community or breeder who has registered the variety in the case of marketing of such material.
(b) The remuneration stipulated in this article shall be a percentage of the net sales price or other remuneration, such as licensing fees, resulting from the commercial exploitation of the propagating material. The applicable percentage shall be determined by the competent authority taking into account the relevant genera/species and nature of use in accordance with the regulations.
(c) Where the registered variety is a new farmer variety as defined by this law the rights may be exercised by individual farmers or the communities where such varieties have been developed and evolved, provided that where the variety was developed within a community the rights can only be exercised by the community. Members of the community that has registered a new farmer variety shall be exempted from payment of the established remuneration.

(3) *Traditional farmers' varieties*

(a) Where a third party undertakes acts referred to in paragraph (1)(iii) in respect of propagating material of a traditional farmer variety, remuneration shall be paid to the Seed Fund established by this law.
(b) The remuneration shall be determined in accordance with paragraph (2)(b) above, subject to the exceptions determined by the regulations, such as with regard to farming communities and persons carrying out activities with the primary aim of promoting the revival and/or use of traditional farmer varieties.
(c) The income of the Seed Fund shall be utilized to support the conservation and sustainable use of plant genetic resources, particularly on-farm conservation and community seed banks.
(d) Notwithstanding paragraphs (a) and (b), where it is identified that the traditional farmer variety is from a particular community or communities, the Seed Fund will take all reasonable measures to provide for the remuneration received to be equitably distributed within such community or communities.
(e) Payment of the required remuneration shall not be conditional upon the registration of the traditional farmer variety.
(f) Without prejudice to the right of farmers or farmers' communities to seek payment of the remuneration established in paragraph (a), the Seed Fund shall be competent to request payment of the remuneration, including through administrative or judicial proceedings.

[245] Based on Article 5 of UPOV 1978.

A sui generis regime of PVP can differentiate the rights granted according to the category of plant varieties protected and the policy objectives pursued. As noted in Chapter 3, the sui generis legislations of several countries introduce some distinctions in this regard, by providing for exclusive rights and other forms of remuneration or benefit sharing depending on the characteristics of the variety involved.

The proposed model provision limits the grant of exclusive rights to those cases where the NDUS requirements are met, that is, where a new uniform plant variety (as defined above) has been registered. In these cases, a set of exclusive rights as provided for under Article 5 of UPOV 1978 are suggested. This means that to undertake acts mentioned in paragraph (1), prior authorization of the right holder would be required. An alternative to the suggested model provision is to introduce a distinction between food and non-food crops (e.g., export crops like flowers), for instance, by providing a set of more comprehensive rights for the latter (based on UPOV 1991). However, this option may run against the difficulty of determining which set of rights would be applicable in cases of dual-use crops (e.g., sugar cane that may be processed for food or ethanol production).

In the case of the category of new farmer and other heterogeneous varieties that are protected under the standard of identifiability (as a replacement for uniformity and stability), it seems logical to provide for less extensive rights[246] in order not to prevent the diffusion of such varieties, while ensuring recognition and remuneration in case of commercialization by third parties.

The proposed model provision (paragraph (2)) suggests the adoption of a remuneration right. This means that in the case of registered new farmer and other heterogeneous varieties the commercial exploitation of the propagating material of such varieties would not require the prior authorization of the right holder. However, remuneration would need to be paid by third parties (with some exceptions – addressed below) commercially exploiting them. Given the diverging circumstances that may arise, the determination of the amount of remuneration is left to the competent authority. Such amount may vary in accordance with the genera/species, with the importance for food security of the new plant variety and with the nature of use (e.g., purpose of use (profit-based or otherwise), whether intended for local or foreign markets etc.).

Paragraph (2)(c) of the proposed model provision clarifies that the rights attached to new farmers' varieties (as defined above under the section dealing with 'Categories of protected varieties') may be claimed by individual farmers or the communities where such varieties have been developed and evolved. However, where a variety is developed in a community context (which is often the case), the rights provided for should be exercised by the community. Individual farmers should not enjoy what would in fact be 'community rights'.[247] In any case, the members of a community that has registered a new farmer variety would be exempted from payment of the remuneration.

In the case of traditional farmers' varieties, the proposed regime would not prevent the commercial exploitation of the propagating material of such varieties by third parties, but would create an obligation, in such a case, to pay remuneration to a fund (the Seed Fund) which would have legal powers to enforce that obligation. This is to allow the implementation of benefit sharing on equity grounds without necessarily requiring the identification of the farmers' communities that contributed to the development of a particular variety.

As mentioned, one of the key objectives is to address misappropriation, that is, third parties (e.g., companies) profiting from the commercialization of traditional farmers' varieties without sharing such benefits with the farming communities. However, one concern is that payment of remuneration may discourage commercialization of traditional varieties.

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246 See, e.g., Genetic Resources Policy Initiative, 'Exploring Legal Definitions of Farmers' Varieties in Strategies to Promote Farmers' Rights' (2006), 26-28 October.

247 Issues of legal standing of communities would need to be addressed at the national level, in accordance with the applicable law.

To address this concern, paragraph (3)(b) makes clear (by referring to paragraph (2)(b)) that remuneration should be determined taking into account the relevant genera/species and nature of use (discussed above). Paragraph (3)(b) also allows the competent authority to exempt relevant persons or entities from payment of remuneration, such as specific farmers or farming communities and any person or entity carrying out activities with the primary aim of promoting the revival and/or use of traditional farmers' varieties.

In addition, remuneration from the commercialization of traditional farmers' varieties is to be collected by a Seed Fund, which in turn should support the conservation and sustainable use of plant genetic resources such as food crops of special interest to the country and farming communities when particular farmers or farmers' communities can be identified as the source of a particular variety. The proposed provision also suggests that support be given, in particular, to on-farm conservation and community seed banks. It may be the case that the Seed Fund, motivated by the possibility of generating revenue, engages proactively to promote the commercialization of traditional farmers' varieties.

As a final point, it is important to note that for the categories of new farmer and other heterogeneous varieties and traditional farmers' varieties, remuneration is triggered only in situations involving acts in paragraph (1)(iii). Other acts such as saving and exchanging seeds/propagating material would not require payment of remuneration. Additionally, small-scale farmers are totally exempt from payment of any remuneration even in the case of commercializing propagating material of a new farmer and other heterogeneous variety or traditional farmers' variety (see section below on 'Acts not covered by conferred rights and exceptions').

4.8 Benefit-sharing contribution

(1) A contribution to the Seed Fund, determined in accordance with the regulations, shall be paid upon issuance by the competent authority of a title on a new uniform plant variety.

(2) The income from the Seed Fund shall be utilized to:

(a) support the conservation and sustainable use of plant varieties, particularly on-farm conservation and community seed banks; and
(b) pay benefit sharing, as determined by the competent authority, to farmers or the communities where it is identified that their new farmers' variety or traditional farmers' variety as defined by this law has been used as a donor of traits/genes in the development of a new uniform plant variety registered under this law.

In determining the amount of benefit sharing, the competent authority may take into account the extent and nature of the use of the new farmers' variety or traditional farmers' variety in the development of the new uniform plant variety, as well as the commercial utility and demand in the market for the new uniform plant variety.[248]

Paragraph (1) proposes a general benefit-sharing mechanism based on payment of a contribution to the Seed Fund whenever a PVP title is issued for a new uniform plant variety. This contribution would compensate the past conservation and improvement of plant varieties, since a new uniform plant variety can only be obtained through the improvement of existing varieties. This model provision requires payment of contribution only from the right holders of new uniform plant varieties, as, unlike with other categories of varieties protected under the model provisions, exclusive rights are granted to the right holder.

The proposed contribution should be set out in the regulations and could vary according to the genera/species, the intended use (food or non-food) of the variety, and other criteria determined by national regulations. It could be calculated on the basis of the net selling price of the propagating material of the protected uniform plant variety or based on a fixed amount depending on the range of sales for different crops.

[248] Article 26(5) of the Indian PPVFR Act.

The proposed benefit-sharing mechanism is based on a simple collection of contributions from the registration of new uniform plant varieties. While this could be a significant advantage, the calculation of the amount to be paid (based, e.g., on anticipated sales, nationality and size of the applicant, etc.) may also be complex. Total or partial exemptions could be provided for small domestic breeding companies, universities and research institutes and individuals. Some governments willing to promote the development and registration of new uniform plant varieties may consider that such a contribution would discourage those activities, but this will obviously be dependent on the level of the required payment and the way it is implemented.

Paragraph (2) makes clear that the Seed Fund should be used to support the conservation and sustainable use of plant genetic resources, particularly on-farm conservation and community seed banks. The income should also be utilized to pay benefit sharing to farmers and communities where it is established that their varieties have been utilized in the development of the registered new uniform plant varieties. In this regard, disclosure obligations (discussed above under the section on 'Registration') may play an important role.

In addition, similar benefit-sharing requirements could also be considered in the context of other relevant legislation (such as the patent law) when patents or other technical restrictions are imposed to restrict multiplication or further breeding of a variety.

4.9 Acts not covered by conferred rights and exceptions

(1) The rights conferred by the protection of a new uniform plant variety do not extend to the following acts:

(a) acts done privately or for non-commercial purposes;
(b) acts done for experimental purposes;
(c) acts done for the purpose of breeding other varieties and for the use and marketing of such other varieties, unless the repeated use of the protected new uniform plant variety is necessary for the commercial production of another variety;[249]
(d) use by farmers for propagating purposes or for exchange with other farmers for propagating purposes, of seeds or other propagating material which they have obtained by planting the protected variety or by exchange with other farmers, provided the propagation does not extend to production for purposes of commercial marketing.

[*OPTIONAL PROVISION (in addition to paragraph (d))*]: In the case of the crops specified in the regulations (e.g., flowers, ornamentals), the right holder may subject use for propagating purposes to payment of an equitable remuneration calculated as a percentage of the net sales price of the propagating material, except where the use is by a small-scale farmer. Failing an agreement between the right holder and the user of the variety on the amount or form of remuneration, these will be determined by the competent authority.

(2) Additionally, the rights conferred by the protection of a new uniform plant variety shall not extend to the sale by small-scale farmers of the seeds or other propagating material that they have obtained by planting the protected variety, provided that the farmer shall not be entitled to sell seed or other propagating material of the protected variety with the trademark or trade name of the right holder. [250]

(3) In the case of new farmer and other heterogeneous varieties and traditional farmers' varieties, the obligation to pay remuneration shall not apply to small-scale farmers as defined by this law.

(4) Any contract or agreement that restricts the acts or annuls the exceptions spelt out in this provision shall be deemed to be null and void.[251]

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[249] See Article 5(3) of UPOV 1978.
[250] See Article 39(1) of the Indian PPVFR Act.
[251] Based on Article 8 of the Swiss Federal Plant Variety Protection Act.

Paragraph (1) clarifies that the scope of protection conferred to new uniform plant varieties does not extend to acts that do not imply marketing of protected propagating material, including saving and exchanging seeds. This aims at preserving traditional practices of farmers that, as mentioned, are critical for their livelihood as well as vital for national food security, local economies, the conservation of agricultural biodiversity and sustainable agricultural production.[252]

A sui generis regime may provide for exceptions different from those admitted under UPOV-compliant laws. Paragraph (1) of the proposed model provision contains certain elements (e.g., sub-paragraphs (a) and (b)) that follow (with some changes) Article 15 of UPOV 1991, while paragraph (1)(c) which concerns the breeder's exemption is modelled on UPOV 1978 (Article 5). Paragraph (1) also introduces elements absent in UPOV 1991.

Paragraph (1)(d) allows farmers planting the protected new uniform plant variety to use and exchange the seeds/propagating material they have obtained from the protected variety, for propagating purposes without authorization of the right holder, except where the production is for purposes of commercial marketing of the propagating material.

The model provision also suggests an option that could be added to paragraph 1(d), to distinguish between different types of crops in relation to the exception allowing the saving, re-use and exchange of seeds/ propagating material. Thus, the right of farmers to use seeds or other propagating material[253] for propagating purposes may be subject in some specified cases (for instance, in the case of flowers for export) to payment of remuneration to the right holder. This optional provision would not apply to small-scale farmers.

Paragraph (2) incorporates a specific exception for small-scale farmers, entitling such farmers to sell the seeds or other propagating material obtained by planting a protected new uniform variety, provided that the brand of the right holder is not used.[254] This provision would not prevent small farmers from using the variety denomination. This exception is in addition to paragraph (1)(d), which allows small-scale farmers to use and exchange the seeds/propagating material of the protected new uniform variety without payment of any remuneration.

The importance of small-scale farmers and policies supporting such farmers is widely acknowledged. The UN Environment Programme (UNEP), the International Fund for Agricultural Development (IFAD), FAO and the UN Special Rapporteur on the right to food all estimate that small farmers produce up to 80% of the food in non-industrialized countries.[255] In a recent paper on small farmers and agroecology, the UN Special Rapporteur on the right to food concluded that global food production could be doubled within a decade if the right policies towards small farmers and traditional farming were implemented.[256] Thus, preserving the traditional practices of small farmers (saving, exchanging and selling seeds/propagating material) is an important policy measure that needs to be implemented nationally.

Other farmers planting a protected new uniform plant variety are allowed to freely save and exchange seeds/ propagating material (but not to sell). If the proposed optional provision of paragraph (1)(e) is adopted, for the crops specified, these other farmers may need to pay remuneration to the right holder for saving and exchanging seeds/propagating material.

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252 See http://www.fao.org/resources/infographics/infographics-details/en/c/270462/.

253 It is worth noting that paragraph (1)(c) just clarifies that the acts of saving and exchanging propagating materials are not subject to the breeder's right since the scope of the rights conferred (in line with UPOV 1978) only covers commercial acts.

254 See, e.g., Article 39(1)(iv) of the Indian PPVFR Act. See also Article 28 of the Ethiopian Plant Breeders' Right Proclamation No. 481/2006; and Section 49 of the Philippine Plant Variety Protection Act of 2002 (Republic Act No. 9168).

255 See, for example, Kanayo F. Nwanze, IFAD, 'Small farmers can feed the world'; UNEP, 'Small farmers report'; FAO, 'Women and rural employment fighting poverty by redefining gender roles' (Policy Brief 5).

256 Olivier De Schutter, 'Agroecology and the Right to Food', report presented at the 16th session of the United Nations Human Rights Council (A/HRC/16/49), March 8, 2011 <http://tinyurl.com/nmxyf87>.

An exception is also spelt out for the other categories of varieties for which no exclusive rights are proposed: small-scale farmers would be exempted from payment of any remuneration in the case of commercialization of the propagating material of these varieties.

An important issue is how to define 'small-scale farmers'. Each country will have to decide for itself the kind of definition which will best suit its agricultural conditions and administrative structures. National laws and international organizations have defined 'small-scale farmers' in a variety of ways. Farm size is a common measure, with some sources[257] defining small farms as those with less than 2 hectares of cropland.[258] For instance, recent analysis by GRAIN estimates that globally about 90% of farms are small with an average holding of about 2.2 hectares.[259] Another way of defining 'small-scale farmers' is by reference to yields. The EU Council Regulation on Community Plant Variety Rights, for example, defines a small farmer in terms of production capacity as someone who does not grow 'plants on an area bigger than the area which would be needed to produce 92 tonnes of cereals', or comparable criteria for other crops.[260]

Yet another option would be to define a small farmer with reference to earnings or income levels.[261] The licensing agreement of Syngenta on Golden Rice, for example, refers to resource-poor farmers as those earning less than US$10,000 per year from farming,[262] but this may be a high threshold in many contexts.

In order to even out the potentially strong fluctuations in purchasing power over time, reference could instead be made to a relative threshold such as the average household income. This is the approach taken by the draft Ethiopian PBR bill, which defines a smallholder farmer as someone whose total earnings from sales of farm-saved seed do not exceed the average household income.[263] The Zimbabwean PBR law, on its part, refers to farmers who derive at least 80% of their annual gross income from farming (on communal land or resettlement land) as those that are allowed to save, use, exchange and sell farm-saved seed.[264]

4.10 Farmers' Rights

In addition to the rights conferred under this law in relation to saving, using, exchanging and selling seeds/propagating material, farmers shall have the right to:

(1) receive support from the Seed Fund for the conservation and sustainable use of plant genetic resources, in particular for on-farm conservation and community seed banks.

(2) participate in making decisions on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture, including the determination of the conditions for implementation of the right to remuneration provided for by this law, the allocation of the funds by the Seed Fund, and the implementation of other aspects of this law.

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257 See, e.g., World Bank, *Reaching the rural poor: A renewed strategy for rural development* (2003); S.K. Lowder, J. Skoet and S. Singh, 'What do we really know about the number and distribution of farms and family farms worldwide?' (2014), background paper for *The State of Food and Agriculture 2014*, ESA Working Paper No. 14-02, FAO.

258 However, the Malaysian PVP law narrowly defines a small-scale farmer as 'a farmer whose farming operations do not exceed the size of holding as prescribed by the Minister', and this is gazetted as 'operations not exceeding 0.2 hectare' (Gazette – October 20, 2008).

259 See http://www.grain.org/article/entries/4929-hungry-for-land-small-farmers-feed-the-world-with-less-than-a-quarter-of-all-farmland.

260 Council Regulation (EC) No. 2100/94, 1994, Article 14; e.g., 185 tons for potatoes, see Commission Regulation (EC) No. 1768/95, 1995 <http://www.wipo.int/wipolex/en/details.jsp?id=6397>.

261 The Economic Research Service (ERS) of the United States Department of Agriculture, for instance, defined small family farms as those with revenues of less than US$350,000. See R. Hoppe and J. MacDonald, 'Updating the ERS Farm Typology' (2013), EIB-110, US Department of Agriculture, Economic Research Service. See also Lowder et al., op. cit.

262 http://www.goldenrice.org/Content1-Who/who4_IP.php

263 B. De Jonge, 'Plant Variety Protection in Sub-Saharan Africa: Balancing Commercial and Smallholder Farmers' Interests' (2014), *Journal of Politics and Law*, 7(3), 100-111.

264 See, e.g., Zimbabwean Plant Breeders Rights Act (2001), Section 17(3)(d).

As noted above, Farmers' Rights should be understood as encompassing the right to save, use, exchange and sell seeds. The model provisions presented in this chapter attempt to effectively realize this right for different categories of varieties and farmers, particularly small-scale farmers.

The proposed model provisions would also permit the realization of other Farmers' Rights specifically mentioned in Article 9 of the ITPGRFA, particularly the right to equitably participate in the benefits arising from the utilization of farmers' varieties and in making decisions relevant for the implementation of the sui generis PVP law.

4.11 Compulsory licences

(1) Upon request of any person, the competent authority shall grant a compulsory licence in respect of a registered new uniform plant variety for reasons of public interest, particularly when the reasonable requirements of the public for seed or other propagating material of the variety have not been satisfied, a high proportion of the propagating material is being imported, or the seed or other propagating material of the variety is not available to the public at a reasonable price.[265]

(2) A compulsory licence shall also be granted when the right holder refuses to license it to a third party on reasonable terms and conditions or engages in anti-competitive practices.[266]

(3) The right holder shall receive an equitable remuneration, to be determined by the competent authority, taking into account the reasons for the grant of the compulsory licence, the value of the authorization and the importance of the diffusion of the variety for food security.

(4) The right holder shall provide the necessary seeds or propagating material to the person to whom a compulsory licence has been issued.

(5) The right holder shall have the right to appeal any final decision granting a compulsory licence. However, the appeal shall not suspend the execution of the compulsory licence.

The UPOV Convention allows for the restriction of the use of a protected variety for reasons of public interest.[267] National laws may determine on an illustrative basis when the circumstances that may justify a restriction to the breeder's right arise. Compulsory licences aim at allowing third parties to use – against payment of an 'equitable remuneration'[268] – a protected uniform variety without the authorization of the right holder. There is ample flexibility to provide for the grounds and conditions for these compulsory licences. Article 31 of the TRIPS Agreement does not apply, as it only deals with patent-related compulsory licences.

The proposed model provision specifies some particular cases where compulsory licences shall be granted, upon request, in line with provisions in the US and Indian laws. It also incorporates circumstances (such as refusal to deal) provided under the Zambian and other national laws.

Importantly, the provision clarifies that an appeal would have no suspensive effects, so as to allow for the immediate execution of the compulsory licence even if the legality, scope or conditions of its grant are challenged by the right holder.

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[265] See as a reference Article 47(1) of the Indian PPVFR Act; Section 44 of the US PVPA, as quoted in Chapter 3; Article 17 of UPOV 1991; Sections 12(3) and 44 of the Zambian Plant Breeder's Rights Act, 2007; Section 36 of the Malaysian Protection of New Plant Varieties Act 2004.

[266] See Article 196(1) of the Egyptian law and Article 175 of the Executive Regulation. See also Section 44(1)(a) and (b) of the Zambian Plant Breeder's Rights Act, 2007.

[267] See Article 17(1) of UPOV 1991.

[268] See Article 17(2) of UPOV 1991.

Compulsory licences are only proposed for new uniform varieties, since other categories of varieties would not give rise to exclusive rights under the proposed sui generis regime.

4.12 Variety denomination

(1) Every applicant shall assign a single and distinct denomination to a variety in respect of which the applicant is seeking registration. No rights in the designation registered as the denomination of the variety shall hamper the free use of the denomination in connection with the variety, even after the expiration of protection granted under this law.

(2) The denomination must enable the variety to be identified. It may not consist solely of figures except where this is an established practice for designating varieties for certain crops, regions or localities. It must not be liable to mislead or to cause confusion concerning the characteristics, value or identity of the variety or the identity of the applicant. In particular, it must be different from every denomination which designates an existing variety, including unregistered traditional farmers' varieties, of the same plant species or of a closely related species.

(3) The denomination of the variety shall be submitted to the competent authority. If it is found that the denomination does not satisfy the requirements of this article, the authority shall refuse to register it and shall require the applicant to propose another denomination within a prescribed period. The denomination shall be registered by the authority at the same time as the variety.

(4) Prior rights of third persons shall not be affected. If, by reason of a prior right, the use of the denomination of a variety is forbidden to a person who, in accordance with the provisions of paragraph (5), is obliged to use it, the authority shall require the applicant or right holder to submit another denomination for the variety.

(5) Any person who offers for sale or markets propagating material of a protected variety shall be obliged to use the denomination of that variety, even after the expiration of the protection under this law in that variety, except where, in accordance with the provisions of paragraph (4), prior rights prevent such use.

(6) When a variety is offered for sale or marketed, it shall be permitted to associate a trademark, trade name or other similar indication with a registered variety denomination. If such an indication is so associated, the denomination must nevertheless be easily recognizable. A denomination assigned to a variety shall not be registered as a trademark under the trademark law.[269]

Every new uniform plant variety, new farmer and other heterogeneous variety for which protection is sought must have a registered denomination. The model provision above is self-explanatory with regard to the scope of this requirement and its implementation. No registration of a denomination would be required in the case of traditional farmer varieties since rights thereon would accrue, to the extent that the variety is identifiable, without prior registration. However, the competent authority should not allow the use of the denomination of traditional varieties by third parties.

4.13 Duration

(1) The protection conferred under this law to new uniform plant varieties shall last for 15 years from the date of the registration of the variety. For trees and vines, the said period shall be 18 years from the said date.

(2) The same terms shall apply in respect of new farmer and other heterogeneous varieties as defined in this law.

[269] Based on Article 20 of UPOV 1991 and Article 17 of the Indian PPVFR Act.

The duration established under UPOV 1978 is suggested for new uniform plant varieties, as well as for new farmer and other heterogeneous varieties.

Countries that are not UPOV members can make their own decision on the duration of protection and provide for terms shorter than those suggested above. Importantly, the TRIPS Agreement does not require a minimum term of protection, unlike in the case of patents and other intellectual property rights covered by the Agreement.

Some countries have adopted legislation that extends protection beyond the terms required by UPOV 1991. There is no sound justification for such an extension, which delays the free availability of plant varieties for multiplication. Indeed, the use of genomic techniques and breeding strategies has allowed breeders to significantly shorten the time necessary to breed a new variety.[270]

4.14 Parallel importation

> Subject to compliance with other applicable regulations, a plant variety protected under this law may be imported for marketing in [the country], without the authorization of the right holder, from any country where the plant variety was put on the market by the right holder or by any authorized person.

This provision exploits the flexibility recognized in Article 6 of the TRIPS Agreement in relation to the 'exhaustion of rights'.[271] It provides for an international principle of exhaustion of rights, according to which a right holder would not be allowed to prevent the importation of a protected variety that has been commercialized in another country by him or by a person who is authorized to do so, such as under a voluntary or a compulsory licence. This provision may be important, for instance, in situations where the prices of seeds are lower in a foreign country. Importation will normally be subject, however, to other regulations, such as phytosanitary measures and seed laws.

4.15 Infringement

> (1) The judicial authorities shall have the authority to order the payment of damages in case of proven infringement of the rights conferred under this law, including the false use of the denomination of a variety. No criminal sanctions will be applied. Damages shall not be payable or an injunction granted where a protected variety was acquired or used by a person prior to knowing or having reasonable grounds to know that dealing in such subject matter would entail the infringement of rights conferred under this law.[272]
>
> (2) Judicial authorities may order the infringer to cease in the use of the protected variety unless it is found that the continuous use of the variety will be in the public interest.
>
> (3) In the case of use of a protected new uniform plant variety by the government, or by third parties authorized by the government, without the authorization of the right holder, the latter shall only be entitled to remuneration[273] taking into account the purpose of the use and the value of the authorization.

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270 See, e.g., Janis and Smith, op. cit., 48.

271 While the proposed provision deals with the exhaustion of rights in an importing country, Article 16 of UPOV 1991 contains a provision establishing some conditions on exhaustion in an exporting country.

272 See, e.g., Article 41.1 of the TRIPS Agreement and Article 42 of the Indian PPVFR Act.

273 See Article 41.2 of the TRIPS Agreement.

Infringement of the conferred rights should only give rise to civil remedies. Criminal sanctions are not required under the TRIPS Agreement except in particular cases relating to copyright and trademark infringement.[274] Such sanctions are also not justified because the rights conferred are private rights and the losses generated by an eventual infringement can be compensated through monetary payments. In most countries (including the developed countries) no criminal sanctions are provided for in the area of PVP as well as in other areas of intellectual property, such as patents.

Although a permanent injunction would normally be granted when infringement has been found, it should not be issued in cases of innocent infringement or where the refusal of a permanent injunction would be justified in the public interest. The former is especially important to protect innocent farmers who unknowingly become involved in PVP infringements. Remedies should be limited to remuneration in the case of government use of a registered new uniform plant variety.[275] This is to ensure that government use (which is presumably done in the public interest) is not affected by an injunction.

4.16 Nullity and revocation

(1) The right on a variety shall be declared null and void, in accordance with the provisions of the national law, if it is established that
  (a) the requirements for protection were not effectively complied with at the time the variety was registered;
  (b) registration has been granted to a person who had no right to register the variety, unless it is transferred to the person who is so entitled.[276]

(2) The right on a variety may be revoked:[277]
  (a) if, after being requested to do so and within a prescribed period, the right holder does not provide the competent authority with the propagating material capable of producing the variety with its characteristics as defined when the variety was registered, the documents and the information deemed necessary for checking the variety, or he does not allow inspection of the measures which have been taken for the maintenance of the variety;
  (b) if the right holder has failed to provide the required information or has furnished incorrect information in filing for the registration of a variety, or has failed to pay within the prescribed period such fees as may be payable to keep his rights in force;
  (c) if the right holder does not commercialize the protected variety in a way sufficient to supply the demand within three years from the date of registration, except in cases of *force majeure* or government act that prevents such commercialization;
  (d) for public interest reasons such as food security, national security, emergency or circumstances of extreme urgency that justify the cancellation of the right;
  (e) if [the competent authority] determines, as a result of administrative or judicial procedures, that the right holder has committed abuses of its rights, for example, through practices declared as anti-competitive;
  (f) if the right holder fails to provide the necessary seeds or propagating material to the person to whom a compulsory licence has been issued.

A PVP title may be nullified if it was granted (registered) in violation of the applicable law, for instance, if one of the requirements of protection (e.g., novelty) was not effectively met. Nullification takes place in cases when the registration was invalid and the cause or causes of invalidity cannot be subsequently cured.

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[274] Article 61 of the TRIPS Agreement only requires application of criminal procedures and penalties to cases of wilful trademark counterfeiting or copyright piracy on a commercial scale.

[275] For an example of a government-use provision, see Article 36(1) of the Brazilian Law 9456 of April 28, 1997.

[276] See Article 21 of UPOV 1991.

[277] For various causes of cancellation or revocation of the conferred right, see, e.g., Article 10 of UPOV 1978; Article 22 of UPOV 1991; Article 34 of the Indian PPVFR Act; Section 40 of the Zambian Plant Breeders' Act 2007.

Revocation may take place for reasons arising in relation to a validly granted title, for instance, lack of payment of maintenance fees or lack of commercialization of a protected variety.

Intellectual property rights, including those on plant varieties, are not absolute, but must be subordinated to the public interest. While a compulsory licence may be used to address various situations (see above), the granting of such a licence requires individual administrative acts and only benefits the party that applied for and obtained the licence. In some situations, the public interest may justify the termination of the protection altogether.

While the proposed model provision partially follows UPOV 1978 and 1991, it adds a number of hypotheses not permissible under the UPOV Convention for the revocation of rights. Paragraph (2)(b) includes situations where the right holder has furnished incorrect information, including where it failed to properly disclose the origin or intentionally provided wrong information about the source of the variety.

Likewise, in cases where the right holder committed abuses or conducted practices declared as anti-competitive, the competent authority should retain the capacity to cancel the conferred rights.

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CHAPTER 5

The Process of Adoption of a Sui Generis Regime

THIS chapter addresses the obstacles that developing countries may face in designing intellectual property legislation suited to their own conditions and needs, specifically in the area of plant varieties. It discusses some arguments against and in favour of a non-UPOV-type sui generis regime, and makes some general recommendations on actions to be taken when developing a PVP law, in particular what kind of assessments should be undertaken and how the process should be conducted, while ensuring transparency and inclusiveness.

5.1 Unused policy space

As discussed in Chapter 2, the TRIPS Agreement contains a general obligation to protect plant varieties that leaves broad policy space to design legal regimes appropriate to local conditions (e.g., predominance of small-scale agriculture and traditional farming practices) and objectives (e.g., poverty reduction, food security, biodiversity conservation, etc.).[278] Some countries have followed the route of experimenting with tailor-made legal regimes for plant varieties. Various factors have influenced the policy options chosen by many developing countries on the matter, as noted by one commentator:

> In the area of plant variety protection, many developing countries expressed interest in adopting sui generis approaches. In practice, however, governments were constrained by limited expertise, institutional capacity, and experience in this area. In lieu of devising completely new laws, most countries were persuaded by technical assistance providers to adopt or adapt the 'off-the-shelf' solutions supplied by the Union for the Protection of Plant Varieties (UPOV). Many governments had also signed bilateral trade deals in which they committed to joining the UPOV system.[279]

5.2 Arguments for adopting the UPOV model

It is not only limited expertise and institutional capacity that have frustrated the possibility of devising adequate sui generis regimes for PVP. In some cases, policy makers have been convinced that following the UPOV model or, even better, joining UPOV would be superior to any other possible option. The arguments for a UPOV option often include:

- applying a proven regime that is already implemented in a large number of countries is safer than experimenting with a system without tradition and precedents;
- there is evidence – particularly the impact studies undertaken by the UPOV Secretariat – showing that the UPOV model promotes plant breeding by encouraging investment in the field;
- there is no evidence, in contrast, regarding the impact of sui generis regimes in countries that have adopted them;
- it is not possible to find a viable legal model to replace the NDUS requirements;
- UPOV is a well-established organization with nearly 50 years of experience in implementing PVP; it would not be feasible to implement a new PVP regime without the technical assistance of UPOV;

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[278] As already noted, the TRIPS Agreement is not yet enforceable in LDCs. Non-members of the WTO are not bound by the Agreement either.

[279] C. Deere, *The Implementation Game: The TRIPS Agreement and the Global Politics of Intellectual Property Reform in Developing Countries* (Oxford University Press 2009), 315.

– UPOV membership ensures that plant varieties developed in the country may be easily protected in other countries;
– following a non-UPOV approach creates the risk of inviting complaints under the WTO dispute settlement mechanism that may end up in trade retaliation against the country;
– joining UPOV will attract foreign direct investment (FDI) in plant breeding;
– UPOV-type legislation will bring public research institutions revenue from royalties collected from the licensing of registered plant varieties.

Each one of these arguments may be rebutted.

Advantages of a proven regime: The UPOV model, as examined in Chapter 1, was essentially developed by European countries to address their own realities. The UPOV membership remained very small until the TRIPS Agreement made plant variety protection mandatory for WTO members. However, the application of a PVP regime harmonized to UPOV standards to countries which differ greatly in their agricultural patterns is contrary to any rational approach to lawmaking. In fact, 'local conditions are a crucial determinant of the appropriate path of institutional reform'.[280] Like with any other intellectual property regime, the impact of PVP will be strongly dependent on the context where it is to be applied.

Moreover, there are still many developing and developed countries that are not members of UPOV 1991, and among UPOV members themselves, many are members of UPOV 1978 which allows more flexibility than UPOV 1991. Hence, there are differences even among UPOV members, which shows that there is no single proven regime.

Evidence on UPOV impact: The evidence on the impact of UPOV-type PVP is elusive. Several academic studies draw skeptical conclusions or, at best, make findings indicating a limited impact of such protection in relation to certain crops.[281] In particular, the UPOV country impact studies[282] are based on 'narrowly drafted indicators, without taking into account key issues like food security, agro-biodiversity, availability of seeds for small farmers, or defining what "for the benefit of society" is supposed to mean'.[283] An increase in the number of registered plant varieties in a limited time period 'leaves unanswered the question whether the UPOV Conventions do or do not have positive impacts on the countries that adopt them'.[284] Moreover, the developing countries analyzed in the UPOV country studies were all members of UPOV 1978, which preserves more policy space for adaptation to local conditions than UPOV 1991.

Available studies find no evidence of a positive effect of the UPOV model on breeding and diffusion of adapted plant varieties in the context of developing countries. Several studies[285] show that PVP is not indispensable for innovation in plant breeding. In fact, a lot of successful plant breeding was done before PVP was established and the majority of plant varieties are developed without asserting PVP. Available studies also show that the UPOV 1991 model is not suitable for developing countries, as it may have negative effects on farmers' capacity to get access to and exchange seeds and thereby on the livelihoods of millions of people in developing countries.[286]

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280 See, e.g., Peter Grajzl and Valentina P. Dimitrova-Grajzl, 'The Choice in the Lawmaking Process: Legal Transplants vs. Indigenous Law' (2009), *Review of Law & Economics*, 5(1), 615-660, available at SSRN: <http://ssrn.com/abstract=1499305>.

281 See the bibliography provided in the annex to this paper.

282 UPOV, 'Report on the Impact of Plant Variety Protection' (2005), UPOV Pub. No. 353 (E).

283 See Berne Declaration, 'UPOV report on the impact of plant variety protection – A critique' <http://www.evb.ch/fileadmin/files/documents/Saatgut/2014_07_Critique_UPOV_report_final.pdf>, 9.

284 Id.

285 See Chapter 3.

286 See Chapter 3.

There is also growing evidence on the human rights impact of legislation modelled on the basis of UPOV 1991. Among other findings, a recently conducted human rights assessment noted that:

> From a human rights perspective, restrictions on traditional practices and seed management systems (e.g., by a UPOV 91-based PVP law) adversely impact on Farmers' Rights, cultural rights, minority rights, indigenous peoples' rights, women's rights, as well as on biodiversity and the right to food.[287]

As noted above, compliance with the UPOV 1991 model affects the ability of developing countries to meet their international obligations, such as promoting Farmers' Rights and safeguarding against misappropriation, as discussed in Chapter 2.

It is important to note that analyses and studies of UPOV 1991 have not only raised concerns over the unsuitability of UPOV 1991 for developing countries but also recommended that developing countries should not join UPOV 1991 but should develop an alternative sui generis regime that is suitable to their realities.[288]

Lack of evidence on sui generis regimes: Sui generis regimes are relatively new; hence, information on their operation and impact is only starting to be generated. However, the evidence available suggests that sui generis systems do work effectively. For instance, Malaysia, which began operationalizing its PVP system in 2008, received 152 PVP applications between 2008 and 2013.[289] International companies filed the majority of these applications (44%).[290] Domestic private companies (22%), government research agencies (15%), universities (13%) and individuals (6%) accounted for the remaining applications filed.

Similarly a large number of applications for PVP have been filed in India. Table 4 shows the applications filed and grants issued, with a notable proportion (55.3%) of applications by farmers.

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287 Berne Declaration, *Owning Seeds, Accessing Food: A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru and the Philippines* (2014), available at https://www.bernedeclaration.ch/fileadmin/files/documents/Saatgut/2014_07_10_Owning_Seed_-_Accessing_Food_report_def.pdf, 7.

288 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 'The UPOV Convention, Farmers' Rights and Human Rights – An integrated assessment of potentially conflicting legal frameworks', available at http://www.giz.de/fachexpertise/downloads/giz2015-en-upov-convention.pdf; Berne Declaration, *Owning Seeds, Accessing Food: A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru and the Philippines* (2014), available at https://www.bernedeclaration.ch/fileadmin/files/documents/Saatgut/2014_07_10_Owning_Seed_-_Accessing_Food_report_def.pdf; Commission on Intellectual Property Rights, 'Integrating Intellectual Property Rights and Development Policy' (2002), http://www.iprcommission.org/papers/pdfs/final_report/CIPRfullfinal.pdf; UNDP, 'Towards a balanced "Sui Generis" Plant Variety Regime: Guidelines to Establish a National PVP Law and an Understanding of TRIPS-plus Aspects of Plant Rights' (2008), http://www.no.undp.org/content/dam/aplaws/publication/en/publications/poverty-reduction/poverty-website/toward-a-balanced-sui-generis-plant-variety-regime/TowardaBalancedSuiGenerisPlantVarietyRegime.pdf; The Special Rapporteur on the right to food, Olivier De Schutter, 'Seed policies and the right to food: enhancing agrobiodiversity and encouraging innovation' (2009), http://www.srfood.org/images/stories/pdf/officialreports/20091021_report-ga64_seed-policies-and-the-right-to-food_en.pdf.

289 Malaysia Country Report presented at the 7th East Asia Plant Variety Protection Forum in Laos and available at http://eapvp.org/report/docs/ANNEX15.%20Country%20Report_Malaysia.pdf.

290 Id.

Table 4. PVP applications and grants in India

Total PVP applications (2007-June 3, 2015)	9,564 (2,244 applications concerned new plant varieties)
Farmer applications received (2007-June 3, 2015)	5,288
Titles granted (up to June 3, 2015)	1,831
Breakdown of titles granted	Public: 665 Private: 376 Farmers: 574 State Agricultural Universities (SAU): 216

Source: India's Protection of Plant Varieties and Farmers' Rights Authority[291]

In addition, India has utilized the Gene Fund set up under its PPVFR Act to establish awards, rewards and recognition for farmers and farming communities involved in the conservation of genetic resources used as donors of genes in varieties registrable under the Act.[292] These are the Plant Genome Saviour Community Award,[293] Plant Genome Saviour Farmer Reward[294] and Plant Genome Saviour Farmer Recognition.[295] Thus far, several awards, rewards and recognition have been handed out. These include cash rewards to 10 farming communities of 10 lakh rupees (about US$15,700) each between 2009 and 2011; and to 10 farmers, one lakh rupees (US$1,570) each in 2012. Recognition (citation and memento) has also been given to 16 farming communities (2007-2010) and 15 farmers (2012).

As more studies are produced, the lessons learned from the implementation of sui generis regimes will be useful to other countries willing to follow a similar route.[296]

No alternative to the NDUS requirements: The requirements of protection can be determined depending on the objectives pursued. The NDUS requirements are just one option that does not exclude other possibilities, particularly when the legislation intends to cover less uniform and stable varieties developed by farmers.[297] The NDUS requirements have been conceived for application in contexts where formal/commercial breeding prevails, while in most developing countries farmers, especially small farmers, are still the main suppliers of seeds.

UPOV's technical assistance is indispensable: There is no doubt that the UPOV Secretariat has developed the capacity to deal with complex legal and technical issues and to assist countries in setting up and implementing examination processes for the registration of plant varieties. This capacity is not, however,

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[291] See http://www.plantauthority.gov.in/pdf/Status%20Crop%20wise%20Application1.pdf and http://www.plantauthority.gov.in/List_of_Certificates.htm.

[292] Sujith Koonan, 'India's sui generis system of plant variety protection' (2014), QUNO <http://www.quno.org/sites/default/files/resources/QUNO%20India%20-%20plant%20variety%20protection%20-%202014.pdf>.

[293] See http://www.plantauthority.gov.in/PGSFA.htm.

[294] See http://www.plantauthority.gov.in/PGSFR.htm.

[295] See http://www.plantauthority.gov.in/PGSFR.htm.

[296] On the Thai PVP regime, see P. Lertdhamtewe, 'Thailand's sui generis system for plant variety protection' (2013), QUNO briefing notes on developing countries' sui generis options; P. Lertdhamtewe, 'Asian approaches to international law: focusing on plant protection issues' (2013), *Journal of Intellectual Property Law and Practice*, 8(5), 388-398; P. Lertdhamtewe, 'Plant variety protection in Thailand: the need for a new coherent framework' (2013), *Journal of Intellectual Property Law and Practice*, 8(1), 33-42; P. Lertdhamtewe, 'Thailand's plant protection regime: a case study in implementing TRIPS' (2012), *Journal of Intellectual Property Law and Practice*, 7(3), 186-193; P. Lertdhamtewe, 'Effective Plant Variety Protection as Development Policy: A Perspective for Thailand' (2011), *Thailand Journal of Law and Policy*, 14(1) <http://www.thailawforum.com/articles/plant-variety-protection-as-development-policy-for-Thailand.html>.

[297] In Europe discussions are ongoing on the protection of heterogeneous varieties that would not comply with the NDUS requirements.

unique. Many PVP offices in developing countries (e.g., India, Brazil, Argentina) could, if the necessary funding is made available, provide technical assistance as efficiently as the UPOV Secretariat or offices from developed countries. This could be an important opportunity for South-South cooperation. Its realization is a matter of financing, not of technical competence. In addition, if the concern is about DUS testing, DUS reports can be bought from some PVP offices, e.g., the European Community Plant Variety Office (CPVO) which supplies such reports to even non-UPOV members.[298] However, it would be important to create the capacity for examination in the developing countries themselves, and not to rely on the expertise of Northern countries, where separate DUS criteria are developed for each species mainly on the basis of breeders' interest in distinguishing their varieties, rather than the interests of farmers who are supposed to benefit from new varieties.

Protecting varieties in other countries: A common misconception in relation to the advantages of joining UPOV relates to the benefits that it may bring about in terms of protection of local varieties in other countries.

The rights arising from the implementation of the UPOV Convention are, like other intellectual property rights, of a territorial nature. This means that the acquisition of such rights depends on the completion of the procedures applicable in *each* country where protection is sought. A plant variety protected in one UPOV contracting party will not automatically be protected in other countries of the Union.

The UPOV Convention does provide for a 'right of priority' which gives a breeder who has 'duly filed an application for the protection of a variety in one of the Contracting Parties'[299] the possibility of prevailing over another application for the same variety submitted in other contracting parties for a period of 12 months. Also, the use or publication of the variety during that period cannot constitute a ground for rejecting the application.[300] The right of priority may facilitate the filing of applications to obtain protection in other countries that are members of UPOV.[301] While this is the only advantage derived from UPOV membership in terms of international protection, it is of limited practical value. A breeder from a particular country interested in obtaining protection abroad (whether a UPOV member or not) would still need to submit an application in every country and follow the applicable procedures until their completion. This is practically impossible for individual breeders, research institutes and small companies from developing countries as well as for small-scale farmers, given the need to pay for specialized advice in each country and the corresponding fees for examination and registration.

In addition, and importantly, the breeder's right only confers *negative* rights, that is, the right to exclude others from, for instance, multiplying and marketing a protected variety. It does not give a positive right to commercialize such variety, which is subject to compliance with seeds legislation and other regulations in force in each country. Moreover, in order to make the most of the efforts and costs involved in obtaining protection in a foreign country, the right holder needs to have the capacity to monitor whether infringement takes place and to bear the legal costs of actions eventually required to prevent it. This is also beyond the reach of most breeders/farmers from developing countries.

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298 By the end of 2014, the CPVO had sold 4,874 technical reports to 52 countries. In general, most requests concern ornamental varieties. See the CPVO's Annual Report 2014 available at http://www.cpvo.europa.eu/documents/Rapportannuel/AR2014_EN.pdf.

299 Article 11(1) of UPOV 1991.

300 See Article 11(4) of UPOV 1991.

301 Countries that are not UPOV members are not bound to recognize a right of priority.

In any case, a non-UPOV member may apply for and obtain without any particular burden PVP in UPOV members. For instance, Thailand (a non-UPOV member) is among the top applicants for CPVO plant breeders' rights.[302]

The risk of WTO complaints: As examined in Chapter 2, the TRIPS Agreement allows ample policy space to design sui generis regimes for PVP. No country that adopted a non-UPOV sui generis regime has been subjected to complaints under WTO rules. This is perhaps an area of the TRIPS Agreement where such complaints are most unlikely.

Foreign direct investment in plant breeding: FDI is dependent on a large number of factors, including market size, rate of growth, availability of human resources and infrastructure, and economic and political stability of the potential host country. Like in the case of other intellectual property rights, granting PVP in accordance with UPOV standards is unlikely to be a determining factor in attracting FDI. This will only take place if other conditions are met. For a foreign investor, a sui generis regime providing adequate protection for its new plant varieties is probably as good as a UPOV-style regime when it comes to deciding where to invest. For instance, in Malaysia, where a sui generis regime is in force, a trend towards an increase in the number of PVP applications by foreigners has been observed. While in 2008 (when PVP implementation began) there were no foreign applicants, by 2013, 35 of the 51 applications were filed by foreign applicants.[303] Thailand has also received PVP applications from Japan and the US.[304]

Licensing fees for public research institutions: Some public research institutions develop new plant varieties as a public good (without asserting any PVP) while others seek PVP to generate licensing fees. In order to do this, they only need a regime that recognizes PVP. A UPOV-compliant regime does not provide any advantage over non-UPOV sui generis regimes. On the contrary, the possibility of obtaining rights over farmers' varieties, as proposed in this working paper, enhances opportunities for cooperation with farmers, such as through participatory breeding,[305] and for the sharing of the benefits arising from the exploitation of new/improved varieties.

Moreover, it is important to note that there are significant costs attached to obtaining and maintaining a PVP grant (e.g., fees for application and maintenance) and enforcement of such a right, especially against experienced commercial companies with significant resources. Relying on PVP to generate revenue could also skew the focus towards the needs of the commercial sector, marginalizing other crops that may be far more important from a food and nutritional security standpoint and the needs of resource-poor smallholder farmers. This may eventually undermine the public mandate of public research institutions. The issue of generating fees from PVP is far from simple and it is important to be aware of the difficulties associated with such a strategy, the likely conflict with the public mandate of such institutions and the financial resources and expertise that will be required.[306]

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302 See CPVO Annual Report 2013, available at http://www.cpvo.europa.eu/documents/Rapportannuel/AR2013_EN.pdf, 45.

303 Malaysia Country Report presented at the 7th East Asia Plant Variety Protection Forum in Laos and available at http://eapvp.org/report/docs/ANNEX15.%20Country%20Report_Malaysia.pdf.

304 Thailand Country Report presented at the 7th East Asia Plant Variety Protection Forum in Laos and available at http://eapvp.org/report/docs/ANNEX19.%20Country%20Report_Thailand.pdf.

305 On this methodology, see, e.g., S. Ceccarelli, *Plant breeding with farmers – a technical manual* (ICARDA 2012), available at file://srvsc01/FolderRedirections/correa/Downloads/Plant_breeding_manual%20(1).pdf.

306 Niels Louwaars, Rob Tripp and Derek Eaton, 'Public Research in Plant Breeding and Intellectual Property Rights: A Call for New Institutional Policies' (2006), Agriculture and Rural Development Notes (June 2006), available at https://openknowledge.worldbank.org/bitstream/handle/10986/9604/370380ARD0Note1ublicResrch01PUBLIC1.pdf?sequence=1.

5.3 Developing a sui generis regime: an inclusive process

This section elaborates on some steps that may be taken to develop a sui generis regime and provides some recommendations. Although national governments have the main responsibility to implement a well-defined, transparent and inclusive process, providers of technical assistance and donors should not be engaged in or support any process which is not transparent, based on a sound assessment and inclusive.

1. Developing a sui generis regime requires a good knowledge of the local situation regarding seed supply, breeding activities, cultivated crops, market trends, diversity in the fields, the social conditions of small-scale farmers, farmers' organizations, local and indigenous communities, etc. Since there is no single regime that 'fits all sizes', it is essential to identify the legal solutions best suited for a particular country. While drafting a law requires legal advice, it would be an obvious mistake to leave the design of a PVP regime only in the hands of lawyers.[307]

To develop a relevant sui generis regime, it is important to conduct a thorough, objective and realistic multidisciplinary assessment of the local situation. This includes: what kind of seed supply system is in place, the extent to which farmers freely save, exchange and sell seeds/propagating material, what type of domestic seed industry and public breeding exists, the current domestic breeding capacity, international obligations of the country (CBD, Nagoya Protocol, ITPGRFA, human rights, etc.), and relevant national objectives and policies (e.g., on nutrition, food security, poverty reduction, agriculture).

Recommendation: Set up an interdisciplinary team to assess the local situation (as mentioned), including experts from disciplines such as agronomics, food production, agricultural economics, plant breeding, plant genetics, sociology/anthropology and law.

2. Precedents (e.g., laws and practices applied in other countries) may be used to facilitate the design or reform of new legislation. Comparative studies are useful. It is therefore important, prior to adoption, to assess the suitability of foreign precedents to the local conditions and whether or not they can contribute to the achievement of the overall national policies.

Recommendation: Explore and analyze legal precedents from other countries (particularly countries with similar conditions, levels of development and agriculture systems) taking into account the differences in the contexts where they have been generated and applied. While legal professionals may take the lead in undertaking such a study, an interdisciplinary assessment is necessary. It would be important, prior to engaging in the drafting of legislation, to examine the suitability of such precedents to national realities, policies and objectives.

3. Based on the information generated on various relevant aspects, a further task is to build up policy expertise to devise the legal regime best adapted to the local conditions, taking into account the nature (and limitations) of intellectual property rights. Importantly, it is worth noting that these rights are merely instruments, not an end in itself. Any PVP regime needs to be fully integrated into and supportive of relevant national policies (on agricultural development, poverty alleviation, trade, food security, biodiversity, innovation, climate change, etc.). Policy expertise needs to be built up with the participation of all relevant stakeholders.

Recommendation: The elaboration of a PVP regime should be seen as a multidisciplinary task involving farmers, commercial breeders, non-governmental organizations, consumers, academics and all the government agencies competent in the formulation or execution of public policies in areas that could be impacted by the introduction or reform of a PVP regime. An ex-ante impact assessment study should be undertaken of the legal options being considered by the government prior to devising the legal regime.

[307] See Deere, op. cit., 323.

4. It is important that the process of designing a PVP regime is open to and inclusive of the views of all relevant stakeholders, as well as transparent, with relevant stakeholders having all the information necessary for effective engagement on the matter. As PVP is directly linked to use of plant genetic resources for food and agriculture, contracting parties of the ITPGRFA also have the responsibility to realize farmers' 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'.[308] Engagement with relevant stakeholders should not be a one-off event of consultation but should be ongoing until concerns of relevant stakeholders, particularly those that are vulnerable (e.g., farmers and indigenous communities), have been addressed.

Normally, the private sector is in a better position to participate in policy making than other actors who have little or no knowledge of the relevant technical and legal issues. This is one of the greatest problems to be tackled in devising consultative processes:

> [A] core challenge is the lack of capacity on IP issues within many relevant stakeholder groups. The influence of some interest groups will not necessarily match the role they deserve in the determination of appropriate IP policy. The business sector may, for instance, be better organized to engage in consultative processes than consumers, educators, or health-care advocates who may require help to have their voice heard.[309]

Recommendation: Set up a transparent and inclusive process of continuous engagement with relevant stakeholders (e.g., farmers, indigenous communities, NGOs, parliamentarians and government agencies), including enabling participation of farmers in making decisions at the national level. The first stage of this process should aim at reaching a common understanding of key concepts and methodologies. A sound policy can be developed only if all participants are capable of formulating and discussing proposals that reflect the interests of their respective constituencies.

5. In designing a PVP regime, careful consideration should be given to issues relating to its effective use and enforcement of the conferred rights. In particular, small-scale farmers and farmers' communities may not be able to benefit from a system that requires compliance with complex and costly formalities. Even if such formalities can be complied with, they may need support to claim their rights or enforce their rights in case of infringement, or to negotiate licences with interested parties. An effective sui generis regime should ensure that its potential beneficiaries, especially those at a disadvantage, can actually exercise their rights.

Recommendation: Develop procedures and institutions that ensure the effectiveness of the PVP regime in protecting the interests of small-scale farmers and farmers' communities.

6. Finally, the process of developing a PVP regime should consider its possible impacts in relation to compliance with the country's international obligations (notably the CBD, ITPGRFA and human rights) as well as what 'flanking measures' are needed to mitigate and remedy any potential adverse impacts of the PVP-related laws on human rights or on farmer-managed systems.[310]

Recommendation: In designing a PVP regime, the international obligations of the country regarding genetic resources need to be taken into consideration. In cases where possible negative impacts are identified, additional measures to avoid or reduce them should be proposed and implemented as part of a coherent policy regarding plant variety production, use and commercialization.

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308 Article 9.2(c) of the ITPGRFA.

309 See Deere, op. cit., 323.

310 See Berne Declaration, *Owning Seeds, Accessing Food: A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru and the Philippines* (2014), available at https://www.bernedeclaration.ch/fileadmin/files/documents/Saatgut/2014_07_10_Owning_Seed_-_Accessing_Food_report_def.pdf.

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ANNEX

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