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# International Conflicts over Plant Genetic Resources: Future Developments?

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# International Conflicts over Plant Genetic Resources: Future Developments?

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## I. INTRODUCTION

### *A. Plant Genetic Resources and Intellectual Property*

Intellectual property issues are becoming increasingly important in the international sphere.[1] These issues interact with environmental law in many ways. With the development of biotechnology, one particular point of convergence between intellectual property (IP) and environmental policy is plant genetic resources (PGRs). This Article explores the conflicts that have arisen over control of PGRs in recent years, drawing upon theoretical frameworks from both international relations and property to understand what has occurred in the past, to sketch what may occur in the future, and to suggest how the international regime could develop in a stable, sustainable, and mutually beneficial way.

PGRs consist of "seeds, plants, and plant parts useful in crop breeding, research, or conservation for their genetic attributes."[2] PGRs are divided into "raw" (in their natural state) and "worked" (altered by deliberate human intervention) resources,[3] although the distinction can be

1. Laurence R. Helfer, *Regime Shifting: The TRIPs Agreement and New Dynamics of International Intellectual Property Lawmaking*, 29 YALE J. INT'L L. 1, 6 (2004).

2. Cary Fowler & Toby Hodgkin, *Plant Genetic Resources for Food and Agriculture: Assessing Global Availability*, 29 ANN. REV. ENV'T & RESOURCES 143, 147-48 (2004).

3. Kal Raustiala & David G. Victor, *The Regime Complex for Plant Genetic Resources*, 58 INT'L ORG. 277, 279 (2004).

difficult to discern in the context of agriculture.[4] Because breeding and research of plants may be conducted for the purposes of enhancing food and agricultural products, as well as developing industrial raw material (rubber), clothing (cotton), and medicine, PGRs "encompass[] an unidentified range of activities."[5]

Both states and private actors have important interests in having easy access to PGRs.[6] Intellectual property rights (IPRs) can affect this access, and thus PGRs have become a point of contention in international relations.[7] States' principal concern with these IPRs is the need for access to repositories of PGRs to ensure food security for their populations.[8] New crop varieties are often based on seeds from various countries.[9] Therefore, it may be necessary to look abroad for plant resource stock that is resistant to new diseases or environmental problems.[10] When doing this, researchers prefer to obtain samples from a national or international *ex situ* collection, because such accessions are usually accompanied by integral information.[11] In fact, most food crops originally come from PGRs developed in other countries.[12] This is particularly the case in the developed world.[13]

Private interests, like corporations, also want access to PGRs in order to improve existing plant varieties and develop commercial products, such as pharmaceuticals.[14] Often, PGRs are analyzed in a laboratory so that patentable compounds can be identified.[15] Patents are one way to protect this type of innovation.[16]

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4. *Id.* at 286.

5. Gregory Rose, *International Law of Sustainable Agriculture in the 21st Century: The International Treaty on Plant Genetic Resources for Food and Agriculture*, 15 GEO. INT'L ENVTL. L. REV. 583, 585-86 (2003).

6. *See generally* Fowler & Hodgkin, *supra* note 2 (discussing the importance of PGRs).

7. *Id.*

8. *Id.*

9. *Id.*

10. GERALD MOORE & MICHAEL HALEWOOD, SYSTEM-WIDE GENETIC RESOURCES PROGRAMME, DEVELOPING ACCESS AND BENEFIT-SHARING REGIMES: PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE 2 (2005), http://www.ipgri.cgiar.org/policy/ABS_brief.pdf.

11. *See id.*

12. *Id.*

13. Fowler & Hodgkin, *supra* note 2, at 147-48.

14. BELLAGIO GROUP, GENETIC RESOURCES: PROMOTING POVERTY ALLEVIATION, FOOD SECURITY, AND RESOURCE CONSERVATION: STRATEGIES FOR ACHIEVING BALANCED NATIONAL POLICIES ON GENETIC RESOURCES, at V (2004), http:/www.ipgri.cgiar.org/Programmes/grst/doc/FinalBellagio040604.pdf.

15. *See generally* Fowler & Hodgkin, *supra* note 2, at 148-66 (discussing the use of PGR's and problems in gather samples).

16. Laurence R. Helfer, Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments 1-2 (FAO Legal Papers Online No. 31, 2002), http://www.fao.org/Legal/prs-ol/lpo31/pdf.

However, these patents raise benefit sharing issues, because the raw material often comes from developing countries, while the resulting profit from the patent remains with the developed world corporation that performed the research.[17] Some developing countries also have moral and cultural objections to patents on living organisms.[18] These states resent paying for products based on their own PGRs,[19] viewing this as theft and labeling it "bio-piracy," because developed countries did not initially recognize IPRs in wild PGRs or traditional knowledge (TK)[20] (bodies of know-how and skills that have been developed by local communities over generations).[21]

As will be explained in more detail later in this Article, the international regime governing access to PGRs has changed from an open commons to protected IPRs supported by national sovereignty but is now showing some signs of shifting back towards a commons once more.[22] This is a process that has been shaped by the dynamics of negotiations between developed and developing states and by the particular plant resource advantages that states have been able to obtain from forum shopping.[23]

The conflict cannot simply be viewed in terms of a North/South divide, nor can the current regime structure be viewed as a series of gains by developed countries at the expense of developing nations.[24] In reality, there has been a continuing tension between the desire for strong IPRs and a desire for open access to PGRs with states from both hemispheres on either side.[25] The agreements which have resulted from this dynamic may be more to the liking of one side than the other of this divide but are still compromises rather than clear wins. However, broadly speaking, the

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17. *See generally* Gavin Stenton, *Biopiracy Within the Pharmaceutical Industry: A Stark Illustration of How Abusive, Manipulative and Perverse the Patenting Process Can Be Towards Countries of the South,* 26 EUR. INTELL. PROP. REV. 17 (2004) (arguing for greater protection of traditional knowledge in undeveloped countries).

18. Shawn N. Sullivan, *Plant Genetic Resources and the Law: Past, Present, and Future*, 135 PLANT PHYSIOLOGY 10 (2004).

19. Rose, *supra* note 5, at 600.

20. *See* Klaus Bosselmann, *Plants and Politics: The International Legal Regime Concerning Biotechnology and Biodiversity*, 7 COLO. J. INT'L ENVTL. L. & POL'Y 111, 132 (1996).

21. *See* Helfer, *supra* note 16, at 9-10.

22. *See infra* Part II.B.

23. *See generally* Raustiala & Victor, *supra* note 3 (discussing the advantage of regime shifting and the various treaty negotiations).

24. *Cf.* J.M. Spectar, *Patent Necessity: Intellectual Property Dilemmas in the Biotech Domain and Treatment Equity for Developing Countries*, 24 HOUS. J. INT'L L. 227 (2002) (discussing the varying North/South strategies in treaty negotiating).

25. *See* Raustiala & Victor, *supra* note 3, at 282-83.

developed countries are more enthusiastic about IP protection[26] and have been successful in gaining international acceptance of this agenda.[27] Nonetheless, there are indications that the developing states are beginning to organize and successfully put forward their own interests.[28]

Efforts to resolve these issues have been ongoing for some decades now. The twentieth century saw a radical change in the international law governing PGRs,[29] a process that is likely to continue well into the twenty-first century as different interest groups negotiate over issues involving IPRs, biodiversity, and development.[30]

### *B. Intellectual Property Rights and Biodiversity*

There are two views on the effects of IPRs on biodiversity. One argument is that IPRs encourage private sector investment in research and development, thus creating products based on genetic resources, which in turn creates benefits that can be shared and facilitate technology transfer.[31] The counterargument is that IPRs encourage the destruction of biodiversity, the creation of monopolies, and the promotion of biopiracy.[32]

IPRs may encourage monocropping and dependence on agrochemicals, including fertilizers, herbicides, and insecticides,[33] which impacts food security. Monocropping creates the possibility of epidemics, because genetically uniform crops are very vulnerable to disease.[34] Perhaps the most striking example is the Great Famine in Ireland.[35] This crisis took place in the 1840s, but the problem is still current.[36] For example, corn blight struck the United States in 1970, and similar epidemics continue to occur in developing countries.[37] Increased

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26. *See infra* Part III.B.1.

27. *See infra* Part III.D.3.

28. *See, e.g.*, *Summary of the Fourth Meeting of the Working Group on Access and Benefit-Sharing of the Convention on Biological Diversity: 30 January-3 February 2006*, EARTH NEGOTIATIONS BULL. (Int'l Inst. for Sustainable Dev., Winnipeg, Can.), Feb. 6, 2006, at 1, *available at* http://www.iisd.ca/biodiv/abs-wg4/ (noting the efforts of developing countries) [hereinafter *Summary*].

29. Raustiala & Victor, *supra* note 3, at 282.

30. *See* Fowler & Hodgkin, *supra* note 2, at 144.

31. GRAHAM DUTFIELD, INTELLECTUAL PROPERTY RIGHTS, TRADE AND BIODIVERSITY 41 (2000).

32. *Id.*

33. Bosselmann, *supra* note 20, at 130.

34. *Id.*

35. *See* Clive Stannard et al., *Agricultural Biological Diversity for Food Security: Shaping International Initiatives To Help Agriculture and the Environment*, 48 HOW. L.J. 397, 403 (2004).

36. *See* Bosselmann, *supra* note 20, at 130.

37. *Id.*

levels of IPR protection for developing countries may not be sufficient to induce economic growth, and in fact could lead to the drawbacks that flow from monocropping.

### *C. Intellectual Property Rights and Development*

IPRs may help developing countries, by enhancing research and development efforts, or hinder them, by stifling innovation.[38] Patents may limit the freedom of developing countries, because they are predominantly held by developed countries, and thus the former should be entitled to levels of access, perhaps through compulsory licenses, for the benefit of their own PGRs.[39] A certain level of technology and capital must be available before higher levels of IPRs will assist in development; however, there is no conclusive link between raising IPR levels and increasing foreign direct investment.[40] These conditions do not always exist in the developing countries, particularly in Africa.[41] Some theorists believe that piracy of IP from the developed world benefits those states' economic development,[42] and many developing nations did not recognize patents on medicines until forced to do so by the Agreement on Trade-Related Aspects of Intellectual Property (TRIPs).[43]

On the other hand, proper IPR protection may be a prerequisite for the transfer of industrial technology from developed countries to the developing.[44] A misperception that IPRs limit the freedom of developing countries to utilize biotechnology may be discouraging investment.[45] Empirical research shows that stronger IPRs help to increase the incomes of small farmers and consumers by encouraging the use of

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38. Graham Dutfield, *Sharing the Benefits of Biodiversity: Access Regimes and Intellectual Property Rights* 8 (Sci. Tech. Innovation Discussion Paper No. 6, 1999), http://www2.cid.harvard.edu/cidbiotech/dp/discussion6.pdf.

39. DUTFIELD, *supra* note 31, at 57-58.

40. Carlos M. Correa & Sisule F. Musungu, *The WIPO Patent Agenda: The Risks for Developing Countries* (S. Ctr. Trade-Related Agenda, Dev. & Equity, Working Paper No. 12, 2002), http://www.southcentre.org/publications/wipopatent/wipopatent.pdf.

41. *See* Ronald P. Cantrell et al., *The Impact of Intellectual Property on Nonprofit Research Institutions and the Developing Countries They Serve*, 6 MINN. J.L. SCI. & TECH. 253, 263 (2004).

42. Spectar, *supra* note 24, at 239.

43. *Id.* at 240. *See generally infra* Part III.D.3 (discussing TRIPs).

44. *See* Paul J. Heald, *Mowing the Playing Field: Addressing Information Distortion and Asymmetry in the TRIPS Game*, 88 MINN. L. REV. 249, 256-57 (2003).

45. *See* Philip G. Pardey et al., *Are Intellectual Property Rights Stifling Agricultural Biotechnology in Developing Countries?*, *in* IFPRI 2000-2001 ANNUAL REPORT 13, 13 (Int'l Food Pol'y Res. Inst. ed., 2001).

biotechnology.[46] Least developed countries (LDCs) may lack the infrastructure necessary to engage in piracy and thus may benefit more from conditions that attract foreign capital.[47]

As intellectual property protection for PGRs expanded, two disputes arose. First, should the holders of IPRs compensate the developing countries and the private parties, generally farmers, who controlled or preserved the foundational wild PGRs?[48] Efforts to resolve access and benefit sharing (ABS) issues are still ongoing.[49] The second issue is the determination of what PGRs were in the public domain.[50] This Article focuses on this issue.

It attempts to understand the current state of the international regime governing PGRs and IPRs, using a combination of theory from property law and international relations to structure the analysis. It highlights issues still in need of resolution and sketches the directions in which the law might develop by providing a framework to help understand the risks and challenges to global governance. It puts forward the hypothesis that the developing world, aided by nongovernmental organizations (NGOs), is becoming more organized and focused on advancing its agenda, and this effort will be an important determinant of future developments.

Part II of the Article deals with the theory and practice of property in PGRs. Part III discusses the resulting regime complex, presenting the fora, the actors, and the agreements. Part IV outlines the unresolved issues. Part V discusses how theory can help to plan the future of policies regarding PGRs, analyzes what the possible negotiating strategies of states might be, and speculates about future possibilities for the PGR regime. It also sketches a mutually beneficial and stable compromise to all concerned actors that should prove to be a lasting one.

## II. PLANT GENETIC RESOURCES AS A COMMONS

In international law, PGRs were originally regulated by an open access regime.[51] As they became more valuable, the regime changed to a closed system of national sovereignty, but it may be shifting to a

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46. *See generally* CARL E. PRAY ET AL., THE IMPORTANCE OF INTELLECTUAL PROPERTY RIGHTS IN THE INTERNATIONAL SPREAD OF PRIVATE SECTOR AGRICULTURAL BIOTECHNOLOGY (2001), *available at* http://www.wipo.int/about-ip/en/studies/pdf/study_k_pray.pdf (discussing research that indicates that the benefits of PGRs go to farmers).

47. Spectar, *supra* note 24, at 234.

48. Helfer, *supra* note 1, at 35.

49. *See Summary*, *supra* note 28, at 9.

50. Helfer, *supra* note 1, at 35.

51. Raustiala & Victor, *supra* note 3, at 281.

commons again.[52] Before examining the historical development of this process, a brief overview of the theory of such shifts in property regimes is useful.

### *A. The Theory*

#### 1. From Commons to Property

Economic theorists, such as Harold Demsetz, view the development of property rights as a function of changing values in external costs.[53] Demsetz explains that "property rights develop to internalize externalities when the gains of internalization become larger than the costs of internalization."[54] While Demsetz proposes that shifts in property rights may occur as a result of external shocks and measured change, critics note that Demsetz fails to address what causes the transition to new property rights and neglects to explain the collective nature of property right creation.[55]

This gap in Demsetz's theory has prompted scholars to reconsider the mechanism by which a transition of property rights may occur, noting particularly that obstacles affect the transition.[56] One such obstacle is the collective action problem.[57] Because a new system may seem to be a public good, individuals most probably would seek its benefits without equally contributing to it, thus creating incentive for the less enthusiastic to free ride.[58] Furthermore, there are administrative costs associated with evaluating individual property rights against the value attributed to individual property rights in the old system.[59] Overcoming these problems without incurring excessive costs can lead to unfair results as administrators take shortcuts to avoid spending disproportionate amounts of time dealing with minor claims.[60] However, it is this negligent valuation of property rights, upsetting what might otherwise be equal distribution, that proves to be a mechanism by which such rights may shift.[61]

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52. *Id.* at 282.
53. Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. (Papers & Proceedings) 347, 350 (1967).
54. *Id.*
55. Stuart Banner, *Transitions Between Property Regimes*, 31 J. LEGAL STUD. S359, S359-60 (2002).
56. *Id.* at S360.
57. *Id.* at S362.
58. *Id.*
59. *Id.* at S364.
60. *Id.* at S368.
61. *Id.* at S369.

2. From Property Back to Commons

After an asset has shifted from commons to individual property, it may be that the ongoing transaction costs are so high that it makes more sense for the property to revert to common ownership.[62] Such a shift may be driven more by interest groups than overall economic efficiency.[63] Regardless of the cause of the shift, the new public uses may not restore a complete commons, and some vestige of private use may remain.[64]

3. Limited Common Property

There is also an intermediate form of property between fully private property and fully open commons, known as *limited common property* (LCP). LCP is defined as "property held as a commons among the members of a group, but exclusively vis-à-vis the outside world."[65] Scholars have begun to correlate this property form with environmentalism,[66] particularly with respect to "market-oriented environmental controls."[67] Richard Stewart has dubbed this "hybrid property," focusing on "allocations of rights to a larger resource whose total use has been consciously limited through regulation" in order "to preserve resources that are large and diffuse but nevertheless finite" through a cap-and-trade system.[68] The underlying rationale is to encourage careful management of scarce resources.[69] Furthermore, forms of property rights can give local and indigenous communities an incentive to conserve wild flora.[70] LCP methods may also have value as a means of structuring ecosystem-based approaches to environmental management.[71]

4. The Anticommons

In addition to private, common, and limited common property, it is possible for property to be subject to so many competing claims, which are impossible to identify and negotiate, that the property is no longer

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62. *See* Douglas W. Allen, *The Rhino's Horn: Incomplete Property Rights and the Optimal Value of an Asset*, 31 J. LEGAL STUD. S339, S345 (2002).

63. Saul Levmore, *Two Stories About the Evolution of Property Rights*, 31 J. LEGAL STUD. S421, S426 (2002).

64. *Id.* at S436.

65. Carol M. Rose, *The Several Futures of Property: Of Cyberspace and Folk Tales, Emission Trades and Ecosystems*, 83 MINN. L. REV. 129, 132 (1998).

66. *See id.*

67. *Id.* at 163.

68. *Id.* at 164-65.

69. *Id.* at 166.

70. *Id.* at 168.

71. *See id.* at 176.

accessible to anyone.[72] This is known as "anticommons property[,] a property regime in which multiple owners hold effective rights of exclusion in a scarce resource."[73] This property form can arise at various levels of use rather than in the property regime as a whole even when only a few owners hold such rights, when it is inefficient, or when the right of exclusion is informal.[74] Because there is no one person with overall decision-making rights, anticommons is closely linked to commons property, but in a commons regime, everyone generally holds a right to be free from exclusion; whereas, in an anticommons regime, everyone holds a right to exclude.[75]

### *B. The Practice*

For a very long time, PGRs were regarded as an open, shared resource in international law.[76] Some states may have tried to impose physical barriers on the appropriation of such PGRs, but this was the exception.[77] Legally, PGRs were free to be taken and used elsewhere.[78]

By the early twentieth century, hybridization of seeds (the cross-breeding of two inbred lines) enabled plant breeders to produce higher yielding seeds.[79] With the development of this hybridization technology came intellectual property rights in agriculture.[80] The rapid development of biotechnology and genetic engineering techniques in the 1970s and 1980s accelerated this process and created a perception that PGRs were valuable and abundant.[81] Developed countries, who had lost much of their biodiversity, sought to exploit the perceived riches of the developing countries, while developing countries wanted to ensure a share of the resulting benefits.[82] These juxtaposed interests of developed and developing countries and the growing concern regarding the preservation

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72. Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 667 (1998).

73. *Id.* at 668.

74. *Id.* at 669.

75. *Id.* at 672.

76. Raustiala & Victor, *supra* note 3, at 284; *see also* Fowler & Hodgkin, *supra* note 2, at 146 ("Few restrictions existed to the collection or to the subsequent transfer of genetic resources.").

77. Raustiala & Victor, *supra* note 3, at 285.

78. *Id.*

79. David S. Tilford, *Saving the Blueprints: The International Legal Regime for Plant Resources* 30 CASE W. RES. J. INT'L L. 373, 386 (1998).

80. *Id.* at 387.

81. Raustiala & Victor, *supra* note 3, at 283.

82. *Id.*

of tropical rain forests led the international community to create property rights in PGRs.[83]

Creating and maintaining property rights in the international community has been a stepped process of treaty and agreement negotiation.[84] The first stage of creating property rights in the international community was the Convention on Biological Diversity (CBD), which made PGRs subject to national sovereignty.[85] Under this agreement, developing countries sought to maintain control over these resources and, through this control, ensure that the developed world would share the benefits of biotechnology equally.[86] This agreement can be seen as a success for the South, although it has not worked as well as the developing countries hoped.[87]

The developed countries were interested in property rights of a different kind. They sought to have property rights over PGRs used for innovation through TRIPs.[88] Although TRIPs was much more to the liking of the North, it may now be leading to a counter-reaction from developing countries.[89]

Because developing countries found that the CBD was creating transaction costs in access to certain core PGRs, the International Treaty on Plant Resources for Food and Agriculture (ITPGR) has emerged, which permits the sharing of a small number of PGRs as a limited commons.[90] This treaty can also be seen as a success for the South.

### *C. The Consequence: A Regime Complex*

According to Kal Raustiala and David G. Victor, creation of IPRs internationally has led to an increasingly complex regime governing PGRs, which they define as

> an array of partially overlapping and nonhierarchical institutions governing a particular issue-area. Regime complexes are marked by the existence of several legal agreements that are created and maintained in distinct fora with participation of different sets of actors. The rules in these elemental

83. *Id.* at 289.

84. *See generally id.* (explaining various treaties and negotiations in the context of emerging property rights in plant genetic resources).

85. *Id.* at 290.

86. *Id.* at 283.

87. *See infra* Part III.D.2.

88. Raustiala & Victor, *supra* note 3, 284.

89. *See infra* Part III.D.3.

90. *See infra* Part III.D.4.

> regimes functionally overlap, yet there is no agreed upon hierarchy for resolving conflicts between rules.[91]

This regime complex has several implications, which will be explored more fully later, such as *path dependence* (existing arrangements limit options for the future), *forum shopping* as parties seek to use the most advantageous forum, and *legal inconsistencies* between agreements for strategic purposes, which are resolved through *implementation and interpretation*.[92]

## III. A REGIME IN CONSTANT FLUX

### *A. Regime Shifting*

In this regime complex, there are a number of fora available for negotiations. States will attempt to "regime shift" in order to generate "counterregime norms," effectively bypassing unfavorable laws.[93] Specialized fora, unlike the CBD, can lead to a quicker shift in regimes, but the negotiating members are not under as much pressure to yield an agreement because "key stakeholders share[] core interests."[94] While broader fora reached agreements more quickly as a result of "credible and public political deadlines," the resulting agreements "tended to yield more conflict," because they glossed over differences in order to yield rapid agreement.[95] Thus, the resulting agreements may pull in incompatible directions.[96]

Developing countries may seek to regime shift in order to open alternate routes to achieve policy success.[97] They may also use regime shifting for the sake of appearances, as a "safety valve."[98] If developing countries are under pressure from either other states or domestic or international NGOs to address issues that they have been reluctant to work on, the country may move the negotiations to an ineffective forum, where they are able to create a façade of action while knowing that no resolution will be forthcoming.[99]

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91. Raustiala & Victor, *supra* note 3, at 279.
92. *Id.* at 279-81.
93. Helfer, *supra* note 1, at 14. Helfer defines a "regime shift" as an "attempt to alter the status quo ante by moving treaty negotiations, lawmaking initiatives, or standard setting activities from one international venue to another." *Id.*
94. *See* Raustiala & Victor, *supra* note 3, at 298.
95. *Id.*
96. *See id.* at 301.
97. Helfer, *supra* note 1, at 55.
98. *Id.* at 56.
99. *Id.*

Alternatively, developing countries may use the new forum to develop new norms which would be impossible to introduce elsewhere.[100] Developed countries allow this shifting to happen either as an acceptable method of pursuing their own interests or because they also see it as an acceptable safety valve.[101]

### *B. The Actors*

#### 1. States

The principal actors in this process are states. These states can be crudely divided on North/South lines, although this classification is somewhat more complicated on closer examination. The North is principally interested in the financial benefits of biotechnology, while the South is more concerned with the basic requirements of food security and economic development.[102] This leads to different interests in IPRs, different applications of biotechnology, and different sources of funding.[103]

Much of the investment and innovation in biotechnology comes from the developed countries, particularly the United States.[104] Much of the biological diversity and traditional knowledge regarding PGRs is found in developing countries.[105] As a consequence, developed countries have historically sought protection of intellectual property (IP), particularly in seed variations, while developing countries have sought open access to the benefits from bio-prospecting (searching for useful traits in existing plants and extracting the relevant genes for use elsewhere).[106]

The application of biotechnology varies between the developed and developing world. In seeking material from seed banks, researchers from developing countries request material that can easily be used in breeding programs, while developed country researchers request material suitable for "basic research."[107] One focus of this "basic research" has been the

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100. *Id.* at 58-59.

101. *Id.* at 62-63.

102. *See generally* Spectar, *supra* note 24 (discussing the variant concerns of the North and the South regarding IPRs).

103. *Id.*

104. Raustiala & Victor, *supra* note 3, at 284.

105. *See* Colin Macilwain, *When Rhetoric Hits Reality in Debate on Bioprospecting*, 392 NATURE 535, 535 (1998).

106. *See* Sullivan, *supra* note 18, at 10.

107. Fowler & Hodgkin, *supra* note 2, at 157-58.

development of transgenic crop biotechnology.[108] Frequently funding comes from private sector investment, which generally does not go toward research on crops for the poor, and public sector research continues to decline.[109] Developing countries, who could benefit most from the application of biotechnology, lack the necessary policies "that can help them become players in the biotechnology revolution" and thus under-invest in it.[110] Some developing countries have begun to lay the foundations for biotechnology research, but they generally have a long way to go to catch up with the developed world.[111]

The developed world is generally interested in higher levels of IPRs.[112] The dominant view there is that "IPRs reward industry, innovation and ingenuity,"[113] favor research, and spread the benefits of biotechnology and biodiversity through commercialization.[114] This is particularly the case for the United States. During the 1980s, a perception developed there that the nation was losing its technological lead as a consequence of piracy elsewhere; as a result, industrial and national interests on IP converged.[115]

The U.S. Trade Representative, which relies heavily on industry for policy guidance, has therefore used sanctions to persuade or force developing countries to raise protection for IPRs.[116] Business interests

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108. Terri Raney & Prabhu Pingali, *Private Research and Public Goods: Implications of Biotechnology for Biodiversity*, *in* AGRICULTURAL BIODIVERSITY AND BIOTECHNOLOGY IN ECONOMIC DEVELOPMENT 39, 47 (Joseph Cooper, Leslie Marie Lipper & David Zilberman eds., 2005).

109. Calestous Juma, *The New Genetic Divide: Biotechnology in a Globalizing World*, Paper Presented at the International Center for Trade and Sustainable Development Workshop on Biotechnology, Biosafety and Trade: Issues for Developing Countries (Bellevue, Switz., July 18-20, 2001) at 6, *available at* http://www.ictsd.org/dlogue/2001-07-19/juma.pdf [hereinafter Juma, *The New Genetic Divide*]; ROYAL SOCIETY OF LONDON ET AL., TRANSGENIC PLANTS AND WORLD AGRICULTURE 23-24 (2000), *available at* http://Newton.nap.edu/html/transgenic; *see also* Calestous Juma, *Biotechnology and International Relations: Forging New Strategic Partnerships*, 4 INT'L J. BIOTECHNOLOGY 115, 119 (2002) ("Enterprises in developed countries have in turn been slow to engage in technological partnerships in developing countries. . . .").

110. Juma, *The New Genetic Divide*, *supra* note 109, at 9.

111. *See* Joel Cohen, John Komen & José Falck Zepeda, *National Agricultural Biotechnology Research Capacity in Developing Countries* 9 (Agriculture & Development Economics Div. of the Food & Agriculture Org. of the United Nations, ESA Working Paper No. 04-14, 2004), ftp://ftp.fao.org/docrep/fao/007/ae069e/ae069e00.pdf.

112. Spectar, *supra* note 24, at 232.

113. *Id.* at 233.

114. *Id.* at 234.

115. UNCTAD-ICTSD PROJECT ON IPRS AND SUSTAINABLE DEVELOPMENT, INTELLECTUAL PROPERTY RIGHTS: IMPLICATIONS FOR DEVELOPMENT 45 (2003), *available at* http://www.ictsd.org/pubs/ictsd_series/iprs/PP.htm.

116. Graham Dutfield, *Trade, Intellectual Property and Biogenetic Resources: A Guide to the International Regulatory Landscape* 10 (Multistakeholder Dialogue on Trade, Intellectual

also formed a transnational Intellectual Property Committee, which encouraged governments in Europe and Japan to cooperate with the United States on this IPR protection project.[117] This alliance led to the TRIPs agreement.[118]

Conversely, developing countries do not all share a common interest on IPRs.[119] There are wide variances in economic, social, and political development between those countries lumped together as developing.[120] As a result, some countries, particularly in Asia, may favor stronger IP regimes while others remain opposed.[121]

To further complicate the varied perspectives on IPR protection among states, there may be wide variance between the interests of different sectors of the economy within a country.[122] Also, different ministries and agencies within the same country may have different priorities.[123] Individual government officials may even be more concerned with personal prestige, career, and travel opportunities than with their national interest.[124] Overall, this makes it difficult for developing countries to band together and take collective action in order to either advance their own agenda or oppose that of the developed world.[125]

2. Nongovernmental Organizations

Nongovernmental organizations (NGOs) also play an important role in the process of IPR protection.[126] Within developing countries, NGOs lobby on behalf of causes such as farmers' rights (India), access to drugs (India and Brazil), and control of biological resources (Africa).[127] There are also international advocacy groups, largely from the developed countries and generally opposed to strong IPRs,[128] as well as corporations and trade organizations that lobby within the developing countries for

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Property and Biological and Genetic Resources in Asia, Background Paper, 2002), http://www.ictsd.org/dlogue/2002-04-19/Dutfield.pdf.

117. *Id.* at 9.
118. *See infra* Part III.D.3.
119. Dutfield, *supra* note 116, at 11.
120. *Id.*
121. *Id.*
122. *Id.*
123. Helfer, *supra* note 1, at 19.
124. *Id.* at 54.
125. *See* Dutfield, *supra* note 116, at 11.
126. *See* Helfer, *supra* note 1, at 53-54.
127. *Id.*
128. *Id.* at 54.

their own various interests.[129] As such, NGOs have had significant impact on the development of the regime governing PGRs, in particular influencing the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR).[130]

### *C. The Fora*

There are three main fora in which PGRs have been discussed: the World Intellectual Property Organization (WIPO), the World Trade Organization (WTO), and the United Nations (UN) Food and Agriculture Organization (FAO). Because different fora are the responsibility of different civil servants, they can have quite varied negotiating dynamics.[131]

#### 1. The World Intellectual Property Organization

WIPO exists to administer various international IP treaties, to assist members in drafting IP legislation, and to promote global IP harmonization.[132] Its roots are in the Paris Convention of 1883 and the Berne Convention of 1886.[133] The *Bureaux Internationaux réunis pour la protection de la propriété intellectuelle* (BIRPI), which administered the aforementioned agreements, became an international IP organization and specialized agency of the United Nations in 1970.[134] Membership is open to members of the Paris or Berne Unions, members of the United Nations or its specialized agencies, members of the International Atomic Energy Agency, any party to the Statute of the International Court of Justice, or any other state by invitation of the WIPO General Assembly.[135] The treaties administered by WIPO deal with substantive international IP standards, single global IP registration, and standards for classification of IP.[136]

WIPO's involvement in the PGR debate stems from two initially unrelated strands of work on genetic resources and biotechnology: the intersection of IP and TK and a long-running collaborative effort with the United Nations Educational, Scientific, and Cultural Organization to

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129. *See* Dutfield, *supra* note 116, at 10.
130. *See infra* Part III.D.4.
131. Raustiala & Victor, *supra* note 3, at 292-93.
132. DUTFIELD, *supra* note 31, at 95.
133. Sisule F. Musungu & Graham Dutfield, *Multilateral Agreements and a TRIPs-plus World: The World Intellectual Property Organization (WIPO)* 4 (Quaker U.N. Office TRIPS Issues Papers No. 3, 2003), http://www.geneva.guna.info/pdf/WIPO(A4)final103004.pdf.
134. *Id.*
135. *Id.*
136. *Id.* at 5.

protect folklore.[137] Recognizing that these efforts were related, WIPO established the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC) in 2001.[138] After gathering a great deal of information, the IGC reported to the WIPO General Assembly in autumn 2003 and currently continues to work toward an international treaty.[139]

Although the negotiation of TRIPs[140] might be seen as superseding WIPO, it has simply led to the creation of a new forum.[141] Since the inception of TRIPs, WIPO has sought to reinvent itself by finding new topics and taking on new roles.[142] It has tried to exploit its expertise in IP to develop a niche in the post-TRIPs system, which has suited developed countries.[143] As part of this process, it has launched a Patent Agenda, created a framework for the future development of international patent system, completed work on the Patent Law Treaty, reformed the Patent Cooperation Treaty, and negotiated the Substantive Patent Law Treaty.[144]

Because WIPO has begun to allow the development of soft law norms through resolutions and recommendation, it offers a flexible forum to avoid the delay involved in negotiating treaties.[145] There is a perception that its International Bureau is more sympathetic to certain members and interest groups, such as those who are pushing for higher levels of IP protection.[146] In addition, the International Bureau has taken actions that seem hostile to the developing countries.[147]

However, in 2004, the WIPO General Assembly adopted a Development Agenda, strongly opposed by the United States.[148] This agenda is designed to ensure that IPRs are used to advance

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137. Nancy Kremers, *Speaking with a Forked Tongue in the Global Debate on Traditional Knowledge and Genetic Resources: Is U.S. Intellectual Property Law and Policy Really Aimed at Meaningful Protection for Native American Cultures?*, 15 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1, 48-50 (2004).

138. *Id.* at 50-51.

139. *Id.* at 53-54; *WIPO Development Agenda Status Unclear*, BRIDGES (Int'l Ctr. for Trade & Sustainable Dev., Geneva, Switz.), Sept.-Oct. 2005, at 22, 22, *available at* http://www.ictsd.org/monthly/bridges/BRIDGES9-9.pdf.

140. *See infra* Part III.D.3.

141. Dutfield, *supra* note 116, at 17.

142. *Id.* at 17-18.

143. Correa & Musungu, *supra* note 40, at 3-4.

144. Musungu & Dutfield, *supra* note 133, at 11.

145. *Id.* at 6-7.

146. *Id.* at 13.

147. *See id.*

148. *U.S. Vows to "Fight" the Push for WIPO Reform*, INTELL. PROP. WATCH (Intell. Prop. Watch, Geneva, Switz.), Nov. 2004, at 1, 1-2, *available at* http://www.ip-watch.org/newsletter_1.pdf [hereinafter *Push for WIPO Reform*].

development.[149] It was proposed by a group of developing countries and considered at special meetings.[150] To date, little concrete progress has been made, but a Provisional Committee on Proposals Related to a WIPO Development Agenda has begun to meet,[151] and its mandate was just continued for a further year.[152] The committee faces a number of significant challenges, such as a tight schedule, difficulties in building alliances, the need for informed debate, and opposition from within the WIPO secretariat.[153]

2. The World Trade Organization

The WTO works to liberalize international trade by lowering barriers and settling disputes.[154] Its roots are in the United Nations' efforts to make world trade more efficient after World War II, which led to the General Agreement on Trade and Tariffs (GATT) and the formation of the International Trade Organization (ITO).[155] The former was intended only as an interim measure until the ITO took effect, but due to lack of support from the United States, the latter failed.[156] As the globalization of trade progressed, the need to replace the GATT system led to the negotiation of the WTO Agreement.[157] Unlike GATT, this operates as a single body of law and thus is much stronger.[158] Despite this structural advantage of the WTO, "GATT [has] remained the dominant forum for trade negotiations."[159]

The United States and the European Union moved from WIPO to GATT to further their intellectual property agenda for two reasons: their dissatisfaction with the WIPO and the attraction of the dominant GATT

149. *Id.* at 2.

150. *Id.* at 3.

151. Carolyn Deere, *What Next for the Development Agenda at WIPO? Priorities for 2006*, BRIDGES (Int'l Ctr. for Trade & Sustainable Dev., Geneva, Switz.), Sept.-Oct. 2005, at 24, 24, *available at* http://www.ictsd.org/monthly/bridges/BRIDGES10-1.pdf.

152. Posting of William New, WIPO Assembly Closes on Cooperative But Serious Note, Intell. Prop. Watch, http://www.ip-watch.org/weblog/index.php?p=416 (Oct. 4, 2006, 19:22 CET).

153. Deere, *supra* note 151, at 24.

154. WTO, What Is the WTO? 2 (2005), http://www.wto.org/english/res_e/doload_e/inbr_e.pdf.

155. Richard Skeen, *Will the WTO Turn Green? The Implications of Injecting Environmental Issues into the Multilateral Trading System*, 17 GEO. INT'L ENVTL. L. REV. 161, 164-65 (2004).

156. *Id.* at 165.

157. *Id.* at 165-66.

158. *Id.*

159. *Id.* at 166.

institutions.[160] GATT had four advantages from their perspective.[161] First, it allowed for rapid globalization of standards because the Uruguay round agreements came as a package.[162] Second, there was more opportunity for bargaining on non-IPR issues.[163] Also, GATT was more developed and friendly to developed countries than the United Nations Conference on Trade and Development (UNCTAD), a "UN forum . . . which would have been a far more attractive place for developing countries to negotiate new global IPR norms," because it tended to favor developing countries.[164] Finally, GATT had a well-developed dispute settlement mechanism.[165] This focus on IPRs was driven by domestic industries concerned about piracy in the developing world.[166] The end result was TRIPs, which seeks to establish minimum levels of patents and other types of IP protection across its membership.[167]

The United States has taken a leading role in driving the IPR agenda in the WTO, often at the insistence of commercial interests.[168] However, the continued raising of levels of intellectual property protection has been criticized as harmful to the interests of both developed and developing countries.[169]

3. The U.N. Food and Agriculture Organization

The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations, which works to defeat hunger through negotiations and serves as an information resource on agriculture, forestry and fishing practices.[170] Political strategies, however, have limited the number of occasions the FAO has been called upon since its establishment in 1946.[171] Although some FAO conferences were

160. Helfer, *supra* note 1, at 20.
161. Dutfield, *supra* note 116, at 5-6.
162. *Id.* at 6.
163. *Id.*
164. *Id.*
165. *Id.*
166. GERARD DOWNES, COMHLÁMH ACTION NETWORK, IMPLICATIONS OF TRIPS FOR FOOD SECURITY IN THE MAJORITY WORLD 6 (2003), http://www.comhlamh.org/pdfs/220_Trips%20Research%20Report.pdf.
167. *See infra* Part III.D.3.
168. Dutfield, *supra* note 116, at 7-8.
169. James Boyle, *A Manifesto on WIPO and the Future of Intellectual Property*, 9 DUKE L. & TECH. REV. 1, 3-4 (2004).
170. FAO, About Us, http://www.fao.org/UNFAO/about/index_en.html (last visited Dec. 6, 2006).
171. Gregory Rose, *International Regimes for the Conservation and Control of Plant Genetic Resources*, *in* INTERNATIONAL LAW AND THE CONSERVATION OF BIOLOGICAL DIVERSITY 145, 150 (Michael Bewnaan & Catherine Redgwell eds., 1996).

organized in the 1960s, the FAO did not become active in the area of PGRs until the 1980s.[172] In 1983, the FAO set up a Commission on Plant Genetic Resources.[173] The Commission was designed to be an expert body open to all, undertaking preparatory work for the FAO.[174] The FAO prepares an annual report on *The State of the World's Plant Genetic Resources*.[175] The FAO has also established an Early Warning System (drawing attention to specific hazards) and a Global Plan of Action (GPA) (coordinating worldwide activities).[176] It has recently produced the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR), which may have a substantial impact on PGRs.[177]

### *D. The Agreements*

Over the years, the international community has developed a number of international agreements governing IPRs and PGRs that together do not comprise a coherent whole system reflecting a single set of principles but rather a dynamic regime complex reflecting the different priorities and interests of the various international actors.[178]

#### 1. UPOV

One of the first agreements in the general area of PGRs is the Convention of the International Union for the Protection of New Varieties of Plants (UPOV).[179] This agreement was adopted in order to promote patent protection for new plant varieties, which the international community increasingly desired.[180] It provides minimum standards of *sui generis* intellectual property rights to commercial plant breeders, commonly called plant variety rights or plant breeders' rights (PBRs).[181] These protections from the original 1961 agreement have been extended over time by the revisions in 1972, 1978, and 1991.[182]

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172. *Id.*
173. *Id.* at 151.
174. *Id.*
175. *Id.*
176. *Id.*
177. *See infra* Part III.D.4.
178. Raustiala & Victor, *supra* note 3, at 279.
179. *See id.* at 283.
180. Bosselmann, *supra* note 20, at 123.
181. Helfer, *supra* note 16, at 11.
182. DUTFIELD, *supra* note 31, at 26-29. For a full description of the history and requirements of UPOV, see Helfer, *supra* note 16, at 12-18.

2. Convention on Biological Diversity

The United Nations Convention on Biological Diversity (the Biodiversity Convention or CBD) was established in May 1992.[183] Under the CBD, genetic resources are a part of national sovereignty, and thus are not common property.[184] The CBD's objectives are the conservation and sustainable use of plant and animal biodiversity and the fair and equitable sharing of the resulting benefits.[185] Moreover, the CBD promotes free trade to finance conservation and the transfer of technology.[186] Although the technology transfer provisions are limited, they have led to efforts promoting the conservation of biodiversity.[187] The CBD does not directly deal with intellectual property,[188] but the Conference of the Parties (COP) adopted the so-called Bonn Guidelines in 2002, dealing with "Access to Genetic Resources and Benefit Sharing" and setting out recommended terms for the transfer of genetic material.[189]

As noted above, the CBD was agreed to by the developing countries in the hope that making genetic resources a matter of national sovereignty would ensure profit from bio-prospecting.[190] However, the CBD has not yielded the expected benefits.[191] This shortcoming is blamed on the operation of the Convention, which seems to have created bureaucratic impediments to commercialization and a reluctance of countries to commit to risky benefit-sharing arrangements.[192] As a result, there is a perception that the CBD has reduced the availability of PGRs from *in situ* sources.[193] The returns from field work can be quite low, as such work requires assistance and access from local communities.[194] In addition, the availability of material and information from seed banks and scientific literature may make field work unnecessary.[195]

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183. Rose, *supra* note 171, at 148.
184. *Id.*
185. *Id.*
186. *Id.*
187. *Id.*
188. John Linarelli, *Treaty Governance, Intellectual Property and Biodiversity*, 6 ENVTL. L. REV. 21, 22 (2004).
189. *Id.* at 28-30.
190. *See supra* Part II.B.
191. Rex Dalton, *Bioprospectors Hunt for Fair Share of Profits*, 427 NATURE 576, 576 (2004).
192. *Id.*
193. Fowler & Hodgkin, *supra* note 2, at 164.
194. Rex Dalton, *Bioprospects Less Than Golden*, 429 NATURE 598, 598 (2004).
195. *See* Dutfield, *supra* note 38, at 2.

There are indications that patents on biotechnology in the United States have led to an anticommons, where "upstream" patents over essential building blocks such as genetic sequences prevent development of "downstream" projects such as medical treatments.[196] The same phenomenon may be occurring in the international regime governing PGRs, as too many acquire the right to exclude.[197] In fact, one of the reasons why bio-prospecting has not worked as well as expected may be that researchers are put off by the difficulties involved in negotiating with all of the groups involved and simply avoid it as an activity.[198] Solving this problem may prove complex, as it is difficult to untangle all of the rights involved in a fair way.[199]

3. TRIPs

TRIPs is a WTO agreement adopted in 1994.[200] Its objective is to establish uniform international standards of IP protection.[201] In the area of PGRs, article 27 provides that "patents shall be available for any inventions, whether products or processes, in all fields of technology" but that "plants and animals other than micro-organisms" may be excluded.[202] However, there is a requirement to "provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof."[203] (The mention of a *sui generis* system was probably a reference to UPOV, and has led to some developing countries signing up to UPOV, which allows members to draft supplementary unilateral treaties within the UPOV framework.[204])

The developing countries most likely accepted TRIPs, despite their misgivings about IPRs, for two reasons.[205] First, TRIPs is part of a packaged whole, and the benefits of the other GATT agreements are

196. Sabrina Safrin, *Hyperownership in a Time of Biotechnological Promise: The International Conflict To Control the Building Blocks of Life*, 98 AM. J. INT'L L. 641, 653 (2004).

197. *See id.* at 653-56.

198. *See id.* at 657-58.

199. *See id.* at 657-59.

200. Helfer, *supra* note 16, at 19.

201. *Id.*

202. Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, 33 I.L.M. 81 (1994), Annex 1C to the Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, 33 I.L.M. 1197 (1994), art. 7, *available at* http://www.wto.org/english/docs_e/legal_e/27-trips.pdf.

203. *Id.* For a detailed consideration of the arguments regarding whether UPOV is the only option, see Helfer, *supra* note 16, at 31-34.

204. UNCTAD-ICTSD PROJECT ON IPRS AND SUSTAINABLE DEVELOPMENT, *supra* note 115, at 52-53.

205. *Id.* at 44.

weighty in comparison.[206] On the other hand, they may have been motivated by the improved access to markets in developed countries, wanting to avoid trade barriers that might result if they stayed out of the new system.[207] "In short, TRIPS was a loss but the WTO package of agreements was a net gain."[208]

Implementation of TRIPs was delayed by increasing transaction costs and a resurfacing of developing nations' initial reservations. Despite the additional time which some states were given to comply, a negative perception of TRIPs still arose in developing countries.[209] This animosity was driven by slow, costly implementation, domestic opposition, and pressure from the United States and the European Union to sign "TRIPs plus" bilateral agreements that contained still higher intellectual property standards.[210] The developed countries' assumption that levels of IPR protection will become progressively higher has produced a hostile reaction from these countries.[211] As the developing countries question the claim that these higher standards encourage the transfer of technology from developed to developing countries, LDCs are reconsidering TRIPs.[212] Some developing countries want to amend TRIPs to lower the level of IP protection currently required.[213] Despite the objections of the United States and other developed countries, some developing countries are pushing for TRIPs Council discussions of the relationship between TRIPS and the CBD.[214] The recent Declaration on the TRIPs Agreement and Public Health, granting developing countries another ten years within which to protect pharmaceutical drugs, may be an indication of efforts to deal with this.[215]

The review of article 27 of TRIPs, which should have taken place in 1999, was incomplete because the developed and developing world could not agree on its scope.[216] Resolving the article 27 issues could require

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206. *Id.*
207. *Id.*
208. Dutfield, *supra* note 116, at 4.
209. Helfer, *supra* note 1, at 24.
210. *Id.*
211. Dutfield, *supra* note 116, at 21.
212. *See id.*
213. UNCTAD-ICTSD PROJECT ON IPRS AND SUSTAINABLE DEVELOPMENT, *supra* note 115, at 51.
214. *TRIPS Council Focuses on Benefit-Sharing for Genetic Resources*, BRIDGES TRADE BIORES (Int'l Ctr. for Trade & Sustainable Dev., Geneva, Switz.), Mar. 18, 2005, at 1, 2, *available at* http://www.ictsd.org/biores/05-03-18/Biores5-5.pdf.
215. *See* Helfer, *supra* note 1, at 4-5; *see also infra* Part IV.B (noting the conflicts between TRIPs and the CBD).
216. *See* Helfer, *supra* note 16, at 23.

patent protection for plants and plant varieties, creating a direct conflict with article 12.3(d) of the ITPGR.[217]

When this modification was discussed during the Doha round of WTO negotiations in 2001, the United States and Japan tried to limit the review to measures already adopted in fulfillment of the requirement to offer some protection for plant varieties.[218] Developing countries (mainly India, Brazil, and African states) wanted a wider debate on whether patents on living organisms should be permitted at all and on harmonizing TRIPs with the CBD and the IU.[219] The European Union sought compromise through harmonization by national legislation rather than through treaty amendments.[220]

The final result of the Doha round negotiations, the Doha Ministerial Declaration, set forth the agenda for the review, largely adopting the developing countries' perspective.[221] Paragraph 19 directs

> the Council for TRIPS, in pursuing its work programme including under the review of Article 27.3(b), . . . to examine, *inter alia*, the relationship between the TRIPS Agreement and the Convention on Biological Diversity, the protection of traditional knowledge and folklore, and other relevant new developments raised by members . . .. In undertaking this work, the TRIPS Council shall be guided by the objectives and principles set out in Articles 7 and 8 of the TRIPS Agreement and shall take fully into account the development dimension.[222]

The reference to articles 7 and 8, which mention "social and economic welfare," "a balance of rights and obligations," "public health and nutrition," and "the public interest," places the review in a broader context and creates an opportunity for more even-handed policy on IPRs.[223] This reflects a greater international understanding of the need to ensure that the use of biotechnology does not adversely impact biodiversity.[224]

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217. *Id.* at 52.
218. *Id.* at 48.
219. *Id.*
220. *Id.*
221. *Id.* at 48-49.
222. World Trade Organization, Ministerial Declaration of 14 November 2001, ¶ 19, WT/MIN(01)/DEC/1, 41 I.L.M. 746 (2002).
223. *See* Helfer, *supra* note 16, at 49.
224. *See* Charles R. McManis, *Intellectual Property, Genetic Resources and Traditional Knowledge Protection: Thinking Globally, Acting Locally*, 11 CARDOZO J. INT'L & COMP. L. 547, 551 (2003).

The TRIPs Council has reviewed the entirety of TRIPs, including article 27.3(b) on the patenting of plant and animal inventions.[225] These reviews are being expanded in consultation with WIPO and the CBD, although some developed countries are seeking to delay this review process pending the conclusion of studies being conducted by WIPO.[226]

4. International Treaty on Plant Genetic Resources

The most recent international agreement governing PGRs is the ITPGR. This treaty grew out of forum-shifting by the developing countries, led by Mexico and aided by NGOs and activists.[227] They selected the FAO as the best place to work on the new international agreement.[228]

Developing countries had two concerns, which they wanted to address during negotiations.[229] First, although they held the majority of the crop collections, they carried out a minority of accessions.[230] Secondly, the developing countries were concerned that developed country plant breeders were securing IPRs for their own varieties, while seeds in traditional use were not being protected.[231] In 1981, a resolution recommending the drafting of a legal convention focusing on these issues was approved.[232] In 1983, this was reduced to a call for a nonbinding undertaking, and the International Undertaking on Plant Genetic Resources (IUPGR) was agreed to by over 100 countries, including many of the developed nations.[233] The Undertaking is part of the FAO Global System for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture.[234] It states that all PGRs are part of the "heritage of mankind and consequently should be available without restriction" for scientific research, plant breeding, and conservation.[235]

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225. Gerard Bodeker, *Traditional Medical Knowledge, Intellectual Property Rights and Benefit Sharing*, 11 CARDOZO J. INT'L & COMP. L. 785, 791 (2003).

226. *Id.*

227. Helfer, *supra* note 1, at 35-39.

228. *See id.* at 16; *see also id.* at 53 (noting developing countries may choose to regime shift); *id.* at 35 (providing an overview of this particular regime shift).

229. UNCTAD-ICTSD PROJECT ON IPRS AND SUSTAINABLE DEVELOPMENT, *supra* note 115, at 55.

230. *Id.*

231. *Id.*

232. Dutfield, *supra* note 116, at 15.

233. *Id.*

234. DUTFIELD, *supra* note 31, at 102.

235. *International Undertaking on Plant Genetic Resources for Food and Agriculture*, Res. 8/83, FAO Conference, 22nd Sess. (Nov. 23, 1983), art. 1, *available at* http://www.fao.org/ag/cgrfa/iu.htm.

This agreement created a conflict with UPOV, which protects PBRs, by creating restrictions on the availability of PBRs.[236] The Undertaking was subsequently revised to state it was "not incompatible" with the principle of common heritage, and to balance these efforts, additional rules regarding farmers' rights,[237] national sovereignty, and a prohibition on IPRs in PGRs held in international seed banks were added to the initiative.[238]

In 1992, the Nairobi Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity adopted a resolution recognizing the need to "harmonise the International Undertaking with the CBD,"[239] particularly regarding access to *ex situ* collections[240] and the question of farmers' rights.[241] In 1993, the Commission on Plant Genetic Resources (CPGR), the FAO commission responsible for governing the IUPGR, recommended that the Undertaking be revised in light of the CBD.[242] Negotiations proceeded slowly and with difficulty[243] but produced more than a revised Undertaking; they resulted in a binding treaty, the ITPGR, implemented in November 2001.[244]

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236. Helfer, *supra* note 1, at 36.

237. "Farmers' rights is a loosely defined concept that seeks to acknowledge the contributions that traditional farmers have made to the preservation and improvement of PGRs. . . . [They] act as a counterweight to plant breeders' rights, compensating the upstream input providers who make downstream innovations possible." *Id.* at 37.

238. *Id.* at 37-39.

239. Rose, *supra* note 5, at 612.

240. These are generally held in botanical gardens and seed banks. *Id.* at 593.

241. *Id.* at 612.

242. The FAO established the intergovernmental Commission on Plant Genetic Resources in 1983. Renamed the Commission on Genetic Resources for Food and Agriculture (CGRFA) in 1995, the Commission currently comprises 160 countries and the European Community. The CGRFA coordinates, oversees, and monitors the development of the Global System for the Conservation and Utilization of PGRFA, which is comprised of the Commission itself, the nonbinding IU, the rolling Global Plan of Action, the International Fund for Plant Genetic Resources, the World Information and Early Warning System, Codes of Conduct and Guidelines for the Collection and Transfer of Germplasm, the International Network of *Ex Situ* Collections under the auspices of the FAO, and the international network of *in situ* conservation areas and crop-related networks. *Negotiations on the International Treaty on Plant Genetic Resources for Food and Agriculture: 30 October-3 November 2001*, EARTH NEGOTIATIONS BULL. (Int'l Inst. for Sustainable Dev., Winnipeg, Can.), Nov. 5, 2001, at 1-2, *available at* http://www.iisd.ca/biodiv/iu-wg/ [hereinafter *Negotiations*].

243. *See id.* at 12 (describing "seven long years of hard-fought and often tedious negotiations").

244. Dutfield, *supra* note 116, at 16. This treaty is available as FAO, *International Treaty on Plant Genetic Resources for Food and Agriculture* (Nov. 3, 2001), http://www.fao.org/ag/cgrfa/itpgr.htm#text. For a survey of the treaty's provisions, see H. David Cooper, *The International Treaty on Plant Genetic Resources for Food and Agriculture*, 11 REV. EUR. COMMUNITY & INT'L ENVTL. L. 1 (2002).

This treaty creates "a special collective property right for a limited number of staple food and feed crops";[245] it is a type of limited common property right within these defined PGRs.[246] This creation is, to a certain extent, a reversal of the process of propertization that brought the CBD into being, caused perhaps by the prohibitive cost of segregating seeds and tracing samples to those working on core crops for the poor, and therefore, the most important PGRs were essentially placed back in the public domain.[247] In fact, most of the movement of germplasm facilitated by genebanks occurs between developing countries, indicating that ease of access is in the interest of these countries.[248]

The main achievement of the ITPGR is the establishment of a Multilateral System of Access and Benefit-Sharing (MS).[249] This section acknowledges states' sovereignty over PGRs, but also allows access to certain material.[250] This access only applies to a carefully negotiated list, set out in Annex I to the ITPGR, of thirty-five crops and thirty-two forages.[251] Access to these PGRs is made available subject to several conditions, which include respecting intellectual property rights, adhering to the standard that "[r]ecipients shall not claim 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,"[252] and accepting a Material Transfer Agreement (MTA), the terms of which are to be adopted by the Governing Body of the ITPGR.[253] The use of a standard MTA is intended to reduce the transaction costs involved in using the Multilateral System.[254]

During the negotiations leading to the ITPGR, some developed countries wanted the MS to include all PGRs,[255] and as the negotiations concluded, the European Union proposed that after the treaty had been in

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245. Raustiala & Victor, *supra* note 3, at 303.

246. Laurence R. Helfer, *Intellectual Property Rights and the International Treaty on Plant Genetic Resources for Food and Agriculture*, 97 AM. SOC'Y INT'L L. PROC. 33, 33-34 (2003).

247. *Id.* at 34.

248. MOORE & HALEWOOD, *supra* note 10, at 2.

249. Cooper, *supra* note 244, at 4.

250. *Id.* at 5.

251. *Id.*

252. FAO, *supra* note 244, art. 12.3(d).

253. Cooper, *supra* note 244, at 7.

254. Stannard et al., *supra* note 35, at 414.

255. *Third Inter-Sessional Contract Group Meeting on the Revision of the International Undertaking on Plant Genetic Resources, in Harmony with the CBD*, EARTH NEGOTIATIONS BULL. (Int'l Inst. for Sustainable Dev., Winnipeg, Can.), Sept. 4, 2000, at 11, *available at* http://www.iisd.ca/biodiv/cgrfa2000a/.

force for five years, the list of PGRs should be expanded.[256] This proposal was resisted by the developing world,[257] but if the MS proves to work well and access creates tangible benefit sharing, they may agree to further open access.[258]

As for the somewhat obscure wording limiting IPRs:

> A brief review of the final stages of the treaty's negotiating history is essential to decipher this cryptic text. Two clauses at the end of the article—"their genetic parts or components" and "in the form"—were included as separate bracketed text going into the final round of negotiations. Developing states that opposed patent protection sought to retain the first clause and delete the second, whereas the United States wanted to delete the first phrase and retain the second. As a compromise, the delegates voted to retain both clauses after defeating a proposal by the United States to delete Article 12.3(d) from the treaty altogether.[259]

While all participating countries agreed that it should not be possible to patent genetic materials in the form received under the MS, disagreement existed among them as to whether and when DNA sequences could be patented.[260] There are two genetic material categories to consider: "parts and components" (patenting of raw DNA sequences simply extracted from PGRs) and "derivatives" (where extracted DNA is combined with other DNA to create a new PGR).[261] The first category is probably excluded by the language of the ITPGR, although some developed countries interpret it as allowing some patents, even though this interpretation would seem to run counter to the spirit of the treaty.[262] The position with the second is more vague, with the European Union taking the position that if parts and components are the subject of innovation, they can be the subject of IPRs.[263] This position on the meaning of the treaty phrase "in the form received" was one of the most contentious issues during the negotiations,[264] and the resulting compromise will likely need further interpretation by the Governing Body.[265]

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256. *Negotiations*, *supra* note 242, at 6-7.
257. *Id.* at 13.
258. Helfer, *supra* note 246, at 35.
259. *Id.* at 34.
260. Cooper, *supra* note 244, at 9.
261. *Id.* at 8.
262. DUTFIELD, *supra* note 31, at 17.
263. Cooper, *supra* note 244, at 9.
264. Rose, *supra* note 5, at 620.
265. *Id.* at 621.

The ITPGR also requires that a share of the profits from commercialization of such derivatives be paid into a fund to be used for the Global Plan of Action.[266] This fund is to be required under the terms of the MTA[267] and must also deal with issues such as the level of IPRs permitted over derivatives, the triggers for payment to the fund, and compliance tracking.[268]

## IV. UNRESOLVED ISSUES

The process of developing a regime complex for PGRs has taken place over an extended period of time. As discussed above, different interest groups have used different fora to advance incompatible agendas, and the agreements that have resulted are not entirely consistent with each other. This Part of the Article addresses a number of those unresolved issues.

### *A. The ITPGR and the CBD*

The ITPGR places certain PGRs in the public domain.[269] This placement may conflict with the CBD, which provides that PGRs are part of national sovereignty.[270] The preamble and article 10 of the ITPGR, however, reaffirm that rights over PGRs are sovereign and make reference in the preamble to the IUPGR's "heritage of mankind," which has become a "common concern of all countries."[271] This modification may suffice to solve the problem for now.

### *B. Article 27.3(b) of TRIPs and the CBD*

As noted above, article 27.3(b) of TRIPs provides that biological organisms are subject to intellectual property protection, through either patents or a *sui generis* regime.[272] This requirement may conflict with the CBD, which provides that PGRs are sovereign property of a State.[273] It is also claimed that these TRIPs provisions may lead to unsustainable use

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266. Cooper, *supra* note 244, at 9-11.

267. FAO, *supra* note 244, art. 13.2(d)(ii).

268. Helfer, *supra* note 246, at 35.

269. FAO, *supra* note 244, art. 11.2.

270. Laurence R. Helfer, *Using Intellectual Property Rights to Preserve the Global Genetic Commons: The International Treaty on Plant Genetic Resources for Food and Agriculture*, *in* INTERNATIONAL PUBLIC GOODS AND TRANSFER OF TECHNOLOGY UNDER A GLOBALIZED INTELLECTUAL PROPERTY REGIME 217, 270 (Keith Maskus & Jerome H. Reichman eds., 2005).

271. FAO, LAW AND SUSTAINABLE DEVELOPMENT SINCE RIO: LEGAL TRENDS IN AGRICULTURE AND NATURAL RESOURCE MANAGEMENT 131 (2002).

272. *See supra* Part III.D.3.

273. *See supra* Part III.D.2.

and biopiracy of IPRs, while some experts argue that a *sui generis* option is the best way to reconcile these two agreements.[274]

The CBD requires prior informed consent of the providers of genetic resources, as well as benefit sharing.[275] TRIPs does not, which means that developed countries do not generally consider issues such as the origin of genetic material, consent of indigenous communities, or the existence of benefit sharing arrangements when granting patents.[276] In addition, IPRs may inhibit "appropriate access" to genetic resources, creating a further conflict between TRIPs and the CBD.[277]

### *C. Developing the FAO Global Plan of Action*

The FAO Global Plan of Action, a worldwide strategy for the conservation of PGRs, requires development, and article 15 of the ITPGR requires that agreements be conducted between the Governing Body of the ITPGR and the Consultative Group on International Agricultural Research International Agricultural Research Centers (CGIAR IARCs)[278] and requires that agreements cover access to PGRs and the relationship between both actors.[279]

Finally, signatories to the IU neglected their obligation to report annually to the FAO on measures taken with regard to PGRs, and the ITPGR does not impose reporting obligations.[280] This lack of data will make it difficult to progress the GPA; however, article 17, covering the Global Information System, does require cooperation with the CBD Clearing House Mechanism in order to develop a global information system on PGRs.[281]

### *D. Article 13.2(d)(iii) of the ITPGR and Article 27.1 of TRIPs*

As noted above, article 13.2(d)(iii) of the ITPGR requires those who exploit PGRs commercially to pay "an equitable share of the benefits"

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274. DUTFIELD, *supra* note 31, ch. 6.

275. U.N. Envtl. Programme, Convention on Biodiversity, art. 15.5 (Dec. 29, 1993), *available at* http://www.biodiv.org/doc/legal/cbd_en.pdf.

276. UNCTAD-ICTSD PROJECT ON IPRS AND SUSTAINABLE DEVELOPMENT, *supra* note 115, at 54.

277. *Id.*

278. IARCs "have been established to provide research results for poor farmers in poor countries." eGFAR, *IARCs*, http://www.egfar.org/action/stakeholders/rubric-5.shtml (last visited Sept. 18, 2006).

279. Helfer, *supra* note 16, at 50.

280. *See id.* at 57.

281. FAO, *supra* note 244, art. 17.

into a trust account.[282] This requirement may violate TRIPs by placing an obligation on holders of IPRs in PGRs over and above what is required of other patent holders, which is not permitted under article 27.1 of TRIPs.[283]

There is precedent which may resolve this application issue. A WTO panel has ruled that a statute which seemed facially neutral, but in fact applied additional obligations on pharmaceuticals, was not in violation of article 27.1.[284] However, the panel refused to decide whether measures limited to a particular area of technology were necessarily discriminatory.[285] Therefore, the issue is not entirely resolved.

### *E. Traditional Knowledge and Farmer's Rights*

The issue that is receiving most attention at present is traditional knowledge. TK is difficult to define, as it embraces many aspects of folklore, including art, stories, and practical information.[286] Its relevance to PGRs is that TK may include information on plant usage[287] and suitable growing conditions,[288] and it is a source of crops for domestication.[289]

There have been controversial incidents in which patents have been issued in the developed world based on such traditional knowledge, sometimes without considering prior art, prior informed consent, or benefit sharing, including, for example, the use of turmeric for healing, need for storage stability, ayahuasca as a medicine, and hoodia cactus as an appetite suppressant.[290] This use of TK has been condemned by NGOs as biopiracy.[291]

Farmers have contributed to PGRs by conserving "landraces," primitive crop varieties, for local conditions.[292] This TK has gone

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282. *See supra* Part III.D.4.

283. Helfer, *supra* note 1, at 41.

284. *See* Panel Report, *Canada-Patent Protection of Pharmaceutical Products* 105-06, WT/DS114/R (Mar. 17, 2000).

285. *Id.*

286. Kremers, *supra* note 137, at 12.

287. *See id.*

288. Michael Blakeney, *Genes and Plant Breeding in an IPR-Led World*, Paper Presented at the 4th International Crop Science Congress (Brisbane, Australia, Sept. 26–Oct. 1, 2004), *in* NEW DIRECTIONS FOR A DIVERSE PLANET: PROCEEDINGS FOR THE 4TH INTERNATIONAL CROP SCIENCE CONGRESS (Tony Fischer et al. eds., 2004), http://www.cropscience.org.au/icsc2004/symposia/3/3/1847_blakeney.htm.

289. *Id.*

290. Dutfield, *supra* note 116, at 29-31.

291. Graham Dutfield, *TRIPs-Related Aspects of Traditional Knowledge*, 33 CASE W. RES. J. INT'L L. 233, 237 (2001).

292. Blakeney, *supra* note 288, § 5.

unrewarded,[293] and as a result, farmers' rights were a topic of substantial discussion during the negotiations of the ITPGR. Negotiations were split more-or-less on North-South lines,[294] and the final provisions adopted were less than what was originally proposed.[295] The following three rights are provided for:

(a). protection of traditional knowledge;
(b). the right to equitably participate in sharing benefits arising from the utilization of PGRs; and
(c). the right to participate in making decisions, at the national level.[296]

It is questionable whether these rights have any real value. They do not include human or property rights for farmers, nor is it clear to whom these rights directly pertain.[297] Without a holder, these rights may be without effect.[298] They are ambiguous with regard to the rights conferred (as the value of PGRs is difficult to calculate and collect), the subject matter of those rights (both landraces and TK are hard to define clearly), and the duration of any right afforded through these provisions (the extent of which is unlike traditional intellectual property).[299] Moreover, notably absent is the anticommons right of exclusion.[300]

The compromise wording agreed to earlier in the ITPGR negotiations, which gave farmers the right to save, use, exchange, and market seeds, was watered down in the final agreement, much to the disappointment of civil society.[301] Instead, a neutral provision was implemented stipulating that nothing in the article should be interpreted as limiting farmers' rights to the above, "as appropriate, and subject to its national legislation."[302] The use of this phrase in the ITPGR[303] limits the requirements placed on states and renders the talk of farmers' rights "ultimately symbolic,"[304] with some activists claiming that any hope of achieving useful rights was merely illusory.[305] Nonetheless, the scope of

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293. *Id.*
294. *See* Rose, *supra* note 5, at 624.
295. Cooper, *supra* note 244, at 3.
296. FAO, *supra* note 244, art. 9.
297. Rose, *supra* note 5, at 622-23.
298. *Id.*
299. Stephen B. Brush, *Protecting Traditional Agricultural Knowledge*, 17 WASH. U. J.L. & POL'Y 59, 87-90 (2005).
300. *Id.* at 91.
301. Cooper, *supra* note 244, at 4.
302. *Id.*
303. FAO, *supra* note 244, art. 9.2.
304. Rose, *supra* note 5, at 624.
305. ETC Group, *The Law of the Seed!*, 3 TRANSLATOR 1, 6 (2001), *available at* http://www.etcgroup.org/documents/trans_treaty_dec2001.pdf.

the ITPGR extends further than that of Article 8(j) of the CBD on traditional knowledge by acknowledging a right to participate in the decision making process.[306] The ITPGR is the first global treaty to formally endorse such rights.[307]

Further, some national laws have been enacted as a result of the ITPGR.[308] India was first to pass legislation in the TK area, with the Protection of Plant Varieties and Farmers' Rights Act No. 53 of 31 August 2001.[309] The Organization of African Unity (OAU) has drafted a model law on biological resources.[310] The Syrian Arab Republic is preparing legislation with the help of the FAO, dealing with facilitated access, benefit sharing, and farmers' rights by following the general outline in the ITPGR.[311]

In light of this weak outcome, it seems that the efforts of developing countries on behalf of TK rights may simply be a bargaining chip that will be discarded in exchange for concessions on other issues.[312] Developing country governments are generally not very active in addressing TK issues domestically.[313] This action also indicates that developing countries are using TK rights internationally as a negotiation tool and thus keeping both domestic indigenous groups and NGOs happy.[314]

## V. THE FUTURE OF THE PGR REGIME COMPLEX

### *A. The Constraints of the Past*

Drawing together the various strands of theory and practice discussed above and looking towards the future, it is clear that the international regime governing PGRs is complex and constantly changing. There are a great deal of interests, concerns, and variables at work in this domain, and the dynamic nature of the system makes predictions suspect. Nonetheless, theory from property law and international relations can be drawn upon to understand the process.

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306. Cooper, *supra* note 244, at 3.

307. FAO, *supra* note 271, at 132.

308. *See id.* at 137-38; *see also* Brush, *supra* note 299, at 93-99 (concluding that the national laws are "a moral but largely rhetorical recognition of the contribution of farmers to the world's stock of genetic resources").

309. FAO, *supra* note 271, at 137.

310. *Id.* at 138.

311. *Id.* at 140-43.

312. *See* Dutfield, *supra* note 291, at 274; *see also* ETC Group, *supra* note 305, at 6 (discussing how some developing countries were not in favor of such rights).

313. Dutfield, *supra* note 291, at 239.

314. Helfer, *supra* note 1, at 56-57.

When common property becomes valuable, it may become subject to individual rights.[315] This propertization may, in turn, create transaction costs which justify reverting to a commons, although the reversion may not be complete.[316] These changes are difficult with administrative costs, collective action issues, and free-riding problems.[317]

This Article has demonstrated how access to PGRs is important for food security and that IPRs over PGRs can impact biodiversity and development. As biotechnology waxed, so did the value of PGRs, leading to a shift from a global commons system to a property regime.[318] The transaction costs from this shift have caused the emergence of limited common property.[319] As the emergence of limited common property has occurred over time in various fora, the international agreements governing PGRs have come to constitute an intricate regime complex, with both inconsistencies and unresolved issues.[320] Raustiala and Victor identified four basic characteristics that can be assumed to result from a regime complex.[321] These are "path dependence," "forum shopping," "legal inconsistencies," and "implementation and interpretation difficulties."[322] Before examining possible future outcomes, an overview of these characteristics of the regime complex is necessary.

*Path dependence* means that although the international community would probably adopt different rules to deal with this area if it were starting from a clean slate, this approach is not possible.[323] TRIPs and the CBD provided the backdrop against which the ITPGR was negotiated.[324] The developed and the developing countries, respectively, want to build on their successes with these international agreements.[325]

In the past, the United States has successfully put forward an agenda of higher levels of IPR protection worldwide.[326] Now, the developing countries are becoming more organized in opposing this agenda and striking bargains on their own terms.[327] When national sovereignty over PGRs proved problematic for research, propertization in

315. Demsetz, *supra* note 53, at 350.
316. Banner, *supra* note 55, at S364-65.
317. *See generally id.* (critiquing propertization theory and rating its consequences).
318. Raustiala & Victor, *supra* note 3, at 289.
319. *See* Rose, *supra* note 65, at 132.
320. Raustiala & Victor, *supra* note 3, at 278.
321. *Id.* at 279-80.
322. *Id.*
323. *Id.* at 271.
324. *See supra* Part III.D.
325. *See supra* Part III.D.
326. *See* Raustiala & Victor, *supra* note 3, at 282-83.
327. *Id.* at 288.

the ITPGR was rescinded only slightly without giving much ground to the developed world, who wanted to return to the former open access commons.[328]

*Forum shopping* means that as the different interest groups seek to further their own advantage, they choose the negotiating arena which seems most likely to produce benefits for them.[329] Therefore, the developed countries have focused their efforts in GATT/WTO fora,[330] while the developing countries have focused their efforts in the FAO.[331]

*Legal inconsistencies* result from negotiations taking place in these different fora.[332] Where the various agreements governing PGRs interact, there are possible conflicts. Avoiding such inconsistencies limits freedom to negotiate, but it also creates opportunities for developing new norms which can be exploited to serve a particular agenda.[333]

*Implementation and interpretation* is the means by which these inconsistencies are resolved.[334] States may use ongoing negotiating processes to develop new soft law norms to provide solutions to these divergences, in the hope that they will be accepted or adopted by the international community.[335] Thus, where a particular interest group is at a disadvantage, it may seek more time for implementation to see if it can import norms from another forum to its benefit.[336]

Thus, the developed countries are making the negotiation of the MTA under the ITPGR a priority,[337] while other countries seem to be attempting to stall this process.[338] Countries who seem to be stalling may be seeking more time to gather support for their agenda,[339] as the text of the MTA will reopen the unresolved issue of IPRs on PGRs acquired under the MS, and they may want to limit the scope of these rights.[340]

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328. *Id.*
329. *Id.* at 280.
330. *Id.*
331. *Id.*
332. *Id.*
333. *See supra* Part IV.
334. Raustiala & Victor, *supra* note 3, at 280.
335. *See supra* Part III.A.
336. Raustiala & Victor, *supra* note 3, at 299-300.
337. *Summary of the Second Session of the Commission on Genetic Resources for Food and Agriculture Acting as Interim for the International Treaty on Plant Genetic Resources for Food and Agriculture: 15-19 November 2004*, EARTH NEGOTIATIONS BULL. (Int'l Inst. for Sustainable Dev., Winnipeg, Can.), Nov. 22, 2004, at 7, *available at* http://www.iisd.ca/biodiv/itpgr2/ [hereinafter *Summary Second Session*].
338. *ITPGR Interim Committee Highlights: Tuesday, 16 November 2004*, EARTH NEGOTIATIONS BULL. (Int'l Inst. for Sustainable Dev., Winnipeg, Can.), Nov. 17, 2004, at 1-2, *available at* http://www.iisd.ca/biodiv/itpgr2/.
339. *See id.*
340. *See supra* Part III.D.4.

The issue of patents on derivatives based on genetic material is also important for the ABS regime under the CBD.[341] Here, the initial recommendations from preliminary negotiations in advance of the next round of negotiations are towards a regime with greater rights for indigenous communities but also for more certainty for commercial interests.[342]

As "the first contractual agreement for facilitated access and benefit-sharing with global application," the ITPGR MTA will in turn influence arrangements under the CBD.[343] While access to genetic resources remains largely free,[344] the user countries (the developed world) want to take the time to study the interaction between the various regimes, whereas the provider countries (the developing world) want to push on with negotiations to ensure benefit-sharing takes place.[345]

Similarly, because some developed countries would prefer that it does not progress, they have pushed for discussion of disclosure of the origins of genetic material or TK in patent applications, a concern of developing countries, to be moved from the WTO to WIPO, where it is likely to progress more slowly.[346]

### *B. Future Strategies*

The examination of the approaches being taken by the various interest groups reveals how they are seeking to make progress now and

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341. *ASB-3 Highlights: Thursday, 17 February 2005*, EARTH NEGOTIATIONS BULL. (Int'l Inst. for Sustainable Dev., Winnipeg, Can.), Feb. 18, 2005, at 1-2, *available at* http://www.iisd.ca/biodiv/abs-wg3/.

342. Posting by Tove Iren S. Gerhardsen, UN Meeting Adopts Draft Global Regime on Use of Genetic Resources, para. 2, Intell. Prop. Watch, http://www.ip-watch.org/weblog/wp-trackback.php?p=213 (Feb. 3, 2006, 21:13 CET).

343. *Summary Second Session*, *supra* note 337, at 8.

344. *Summary of the Third Meeting of the Ad Hoc Open-Ended Working Group on Access and Benefit Sharing: 14-18 February 2005*, EARTH NEGOTIATIONS BULL. (Int'l Inst. for Sustainable Dev., Winnipeg, Can.), Feb. 21, 2005, at 10, *available at* http://www.iisd.ca/biodiv/abs-wg3/.

345. *Id.* at 11; *see also Summary*, *supra* note 28, at 9 ("[T]he negotiation of the international ABS regime resembles a race between 'tortoises' and 'hares.' The hares, represented by the members of the Likeminded Megadiverse Countries (LMMC), the Latin American and Caribbean Group (GRULAC) and the African Group, came to the meeting ready and willing to start negotiating. With a common vision of a strong regime, they were quick to accept the text presented by Chair Clemente as a way forward and pushed for this text to serve as the basis for negotiations, even though they regarded it as largely 'Eurocentric.' The tortoises, as represented by the EU, Switzerland and Norway, were taken aback by the unexpected presentation of the Chair's text and, even if it may have reflected many of their positions, were not prepared to run with it. Yet other tortoises, like Australia, Japan, New Zealand and Canada, simply did not think this was the right time to start the race.").

346. Posting of William New, Officials Make Incremental Progress in TRIPS Talks, Intell. Prop. Watch, http://www.ip-watch.org/weblog/index.php?p=29 (Mar. 15, 2005, 19:22 CET).

gives some indication of how progress can be made in the future. Developed countries seem to be shifting to WIPO, as a safer, slower forum.[347] WIPO has a history of association with those seeking to raise IP protection.[348] The alternatives are not as receptive to their agenda, because the developing countries have gained more influence at the WTO, and as the Doha Declaration indicates,[349] they currently dominate the FAO.

The shift to the WIPO may, in fact, suit developing countries also, as they can draw on the expertise of WIPO, use the time to resolve their internal differences, make progress without the need for a treaty, and capitalize on WIPO's status.[350] Developing countries will be further bolstered by the recent adoption of a Development Agenda by the WIPO General Assembly.[351] Raustiala and Victor predict that this regime shift to the WIPO may lead to a new element in the PGR regime complex, as those who seek protection for TK will try to create strategically inconsistent rules requiring resolution.[352] It would be tempting to conclude from these benefits to developing countries that the balance of power is swinging from the developed countries to the developing, but international relations are not this simple, particularly with regard to IPRs.

The developed countries have considerable influence through trade and a relatively coherent and broadly agreed-upon approach.[353] The developing countries do not have these advantages.[354] Developing countries face serious challenges if they hope to put forward a successful agenda in WIPO. To put forth a successful agenda, they will need to organize effectively, avoid the use of regional "divide-and-conquer" tactics to neutralize them, and reconcile their internal differences.[355] The developing countries will also need to ensure that they have permanent and coordinated representation, form an effective coalition, and streamline national and international IP policy.[356] Throughout these processes, developing countries must channel their efforts around existing legal and institutional arrangements.

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347. *See id.*
348. *Id.* at 79.
349. Helfer, *supra* note 16, at 48.
350. Helfer, *supra* note 1, at 79-81.
351. *See Push for WIPO Reform*, *supra* note 148, at 1-3.
352. Raustiala & Victor, *supra* note 3, at 305.
353. *See supra* Part III.B.
354. *See supra* Part III.B.
355. *See* Musungu & Dutfield, *supra* note 133, at 20-22.
356. *See id.* at 22.

If the developing countries do succeed in forming a coherent group, it would seem that their best strategy is to slow negotiations on the ITPGR MTA.[357] They can use this time to create norms which are strongly favorable to benefit-sharing and technology transfer in the CBD system, where they have the advantage. Ideally these can, in turn, be imported into the ITPGR process. Simultaneously, they can focus on WIPO and use TK as a bargaining tool there to gain concessions which will make development a more prominent factor in international IP negotiations.[358] This can be used to influence negotiations on the review of article 27 of TRIPs, building on the Doha Ministerial Declaration.[359]

### *C. The Risks*

Although developing countries have directed their efforts to build on their advantages in the CBD and use the WIPO dynamics to their benefit, there is no certainty that this is in fact their plan or that the plan will work.[360] The outcomes of regime shifting are not easy to predict,[361] and the developed countries may be able to restrict the scope of discussions in these various fora to preserve the advantages they have gained in the past.[362] There are, therefore, a number of directions in which the regime complex for PGRs could develop in the future.

Reversion to a full commons is very unlikely.[363] As negotiations over the ITPGR show, the developing countries are very much opposed to undoing the CBD, despite pressure from the developed countries.[364] Full propertization is also unlikely, because the transaction costs this creates are undesirable to all.[365]

The response to these costs was the ITPGR, which creates a limited common property over a short list of crops.[366] If this works well, the most likely future model for PGRs will be "hybrid property," a system of free access for research for agricultural purposes but with a requirement of financial benefit sharing for any commercial uses. Whether this will emerge from the FAO, WIPO, or the WTO is impossible to predict at this point, although an expansion of the ITPGR MS seems most likely.

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357. *See Summary Second Session*, *supra* note 337, at 2.
358. Dutfield, *supra* note 291, at 274; *see supra* Part IV.E.
359. *See supra* Part III.D.3.
360. Helfer, *supra* note 1, at 82.
361. *Id.*
362. *Id.* at 82-83.
363. *See supra* Part III.B.
364. *See supra* Part III.D.4.
365. *See supra* Part II.A.
366. *See supra* Part III.D.4.

However, the ITPGR ABS system may not work well enough because the seed sector is not very profitable, benefit sharing only applies in limited circumstances, and there will be a delay between the transfer of PGRs and the payment of funds in return.[367] If the resulting financial benefits are inadequate, there is a risk that the small shift back towards a commons will not continue.

Instead, the difficulties which the CBD has created for biotechnology research will continue or even worsen. The regime complex governing PGRs will become an anticommons where governments, local communities, and NGOs are able to exclude researchers even where this exclusion is inefficient or even counter-productive.[368] This risk is the core challenge for global governance as negotiations continue.

### *D. A Sustainable Future*

Thus, of paramount importance is that developed world states and corporations participate in the new scheme and share the resulting benefits with the developing world. The development of an anticommons is undesirable to all actors, whether part of the developed or developing world.[369] As discussed above in this Article, the current unsettled state of the regime is also detrimental to both sets of interests, as it prevents the developed world from profiting from new IPRs and denies the developing world a share of those profits. Given the importance of PGRs, it is necessary that all states involved with them align the rules congruently. Predictability and stability have value for all. To ensure this, both sides must feel that they have achieved a good outcome so that the temptation to continue to seek advantages in other fora and new agreements is removed. Otherwise the international community will continue to go through long, exhausting negotiations, as demonstrated above.

There is a need to find a mutually satisfactory equilibrium between developed and developing countries on the level of IPRs permitted, equitable benefit-sharing, and technology transfer. This equilibrium must permit innovation, protect biodiversity, respect traditional knowledge, and support development, while avoiding the creation of an anticommons. Such a system will involve pragmatic compromises on both sides to ensure that it is durable. There are indications that this

367. Cooper, *supra* note 244, at 11.
368. *See supra* Part II.A.4.
369. *See supra* Part II.A.4.

balancing may already be taking place. The negotiation of the ITPGR and the Doha Ministerial Declaration on the review of article 27.3(b) are good examples of such compromises.[370]

In order to meet this need, the developed world needs to accept that it can no longer simply take genetic material (and the know-how needed to use them) from the developing world and exploit it without sharing the proceeds with the community and state of origin. It must also share technological developments with the developing world. In turn, the developing world must accept that it is not in its long-term interest to claim complete sovereignty over its biodiversity. The difficulties this position creates for research and development cuts off potential streams of income and sources of new technology to the developing world. Both groups should focus their efforts on building a strong ABS system, founded on an enforceable MTA, to ensure that all have an interest in maintaining the new regime.

Although predicting the details of such an agreement (or exactly when and how it will emerge) is not feasible, it is possible to sketch some of the requirements which would satisfy all actors enough to create stability for some time to come.[371] In order to satisfy the developing world, there must be contractual terms guaranteeing that those who exploit PGRs provide a share of the resulting profits to the source provider community. Rights to these profits must be enforceable as a matter of contract law by representatives of that community so that the money does not simply go to the central government. Clearly identifying the members of individual communities and the appropriate representatives is difficult, and each state will need to define its own rules for this identification process.

There must also be acknowledgment by the developed world of the contributions of farmers to the preservation of PGRs. As a consequence, the farmers' rights provisions in the ITPGR need to be strengthened. There must also be an acknowledgement of the value of traditional knowledge. This should extend as far as recognizing that access to TK is a valuable element in gaining benefits from PGRs and must be rewarded with a share of the profits from the products that result.

Furthermore, the developing world should be given the option of exercising a compulsory license on reasonable terms for the production of essential medicines and drugs, even if they are subject to IPRs.[372] In order to ensure that this privilege is not abused, its exercise should

370. *See supra* Part III.D.3.
371. *See supra* Part III.B.
372. *See supra* Part IV.

require the permission of an independent expert body. The developed world must also gain from the bargain, of course. This gain can be achieved by requiring open access to PGRs, provided the ABS regime is complied with. To prevent the development of an anticommons, states and communities should be denied a veto right over access by researchers. Building on the concept of facilitated access, which is the foundation of the ITPGR, access will be based on explicit consent to the terms of an agreed MTA and thus preserve national sovereignty over PGRs. This guaranteed access and a stable regime are a fair bargain for the concessions demanded by the developing world. The recently adopted ITPGR MTA, which is contractually binding and contains financial disincentives against restrictive IPRs,[373] is a first step in this direction.

## VI. CONCLUSION

With the rise of biotechnology, controlling access to PGRs has become an important issue in international environmental and intellectual property law. The perception that these resources were valuable led to the negotiation of the Convention on Biological Diversity. When this convention created too many difficulties for researchers and the anticipated financial rewards from the CBD did not materialize, the developing countries opened access to some PGRs on a limited basis. Throughout this process, different interest groups have moved from forum to forum, exploiting the advantages which the fora offered for their particular agenda, and have created a regime complex of divergent agreements that contain a number of unresolved issues.

There is a risk that these strategies could produce a mutually damaging anticommons in PGRs which inhibits research, whether the research is carried out for the benefit of the developed or developing world. To avoid this and to create a stable and predictable regime, the developed world must concede the need for contractually binding benefit-sharing MTAs, stronger protection for farmers' rights and TK, and reasonable compulsory licenses for essential drugs. In return, the developing world must guarantee the developed world facilitated access to PGRs without national or local vetoes. Through these mutually beneficial sacrifices, the international community can arrive at an

373. *Summary of the First Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture: 12-16 June 2006*, EARTH NEGOTIATIONS BULL. (Int'l Inst. for Sustainable Dev., Winnipeg, Can.), June 19, 2006, at 6, *available at* http://www.iisd.ca/biodiv/itpgrgb1/.

equilibrium that will help to maintain global food security and technological advances in a balanced manner for years to come.