

Shifting Common Spaces of Plant Genetic Resources in the International Regulation of Property

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The appellative “common heritage of mankind” is often used as a description of the property domain that governed plant genetic resources (PGR) at an international level up until the end of the twentieth century. However, the concept is rarely elaborated on. In this article we explore the origins of common property in PGR and the shifting content and shape of the genetic commons over the past several decades.

Using the theoretical framework of diverse common property regimes developed by Peter Drahos, we chart the way in which the emergence and interaction of various international regulatory regimes related to PGR reshape common property spaces, rights and obligations.

We argue that these international agreements do not regulate a single property domain in isolation, but rather modify the content and boundaries of the complex set of property domains that apply to PGR: private, state, common and public. More than a theoretical conundrum, we show that any realistic appraisal of the implementation of the international regulatory regimes in relation to PGR must acknowledge the conflicting and complex dynamics of these interrelated property domains, as well as the way in which they are being put into place on the ground.

Keywords common property; intellectual property; plant genetic resources; agricultural biodiversity

Traditionally and until the late twentieth century, plant genetic resources belonged to a global commons and were deemed to be the “common heritage of humankind”. This sort of opening remark is common to many scholarly works and international agreements dealing with the regulation of plant genetic resources (PGR) or genetic resources more generally (Brush, 2003; Safrin, 2004; Raustiala; Victor, 2004). But what does “common heritage” mean? What is a global commons? What are the implications of governing a resource in this way? And what happened at the end of the twentieth century such that PGR no longer constitute a “common heritage”?

This article offers answers to these questions within the context of a broader attempt to provide more clarity in discussions of the genetic commons. After a brief introduction to the concept of common property and its application to PGR for

food and agriculture (PGRFA), we draw on Peter Drahos' (2006; 1996) work to outline four different kinds of common property regimes. In the main section of this article, we then use Drahos' theoretical framework to chart the way in which common property in PGR has been reshaped and transformed through various international agreements. Our purpose in doing so is to outline the point at which we find ourselves today—i.e. what PGR is still held in common, and what does this actually mean?—and how it is that we have arrived at this point.

The shifting common spaces of PGR that we chart in this article highlight the way in which different international regulatory regimes re-form property domains even when they do not explicitly regulate them. This analysis, therefore, challenges the simplistic distinction that is sometimes made between conservation regimes on the one hand and intellectual property (IP) regimes on the other. This simplistic position appears to ground the view adopted by several countries that:

the TRIPS Agreement and the CBD have different, non-conflicting objectives and purposes and deal with different subject-matter (Council for the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), 2002; 2006)

On the basis of this distinction, these countries have often dismissed outright the need for more discussion and debate about the way in which these different regulatory instruments interact and reshape a wide range of proprietary spaces, rights and obligations. In this article we are specifically interested in these interactions, in the way in which common spaces are reshaped in a cumulative and entangled manner at the interface between different international regulatory regimes.

PGR as Commons: What Sort of Commons?

A commons is, first and foremost, a type of property regime, a set of rights derived from rules or norms held by persons in relation to a good (Ostrom and Schlager, 1996). In almost all common property regimes, members of a group regulate access and use of a resource and have the right to exclude non-members (Drahos, 2006; Ostrom, 2000). Forests, grazing areas, fisheries and water sources are examples of resources that have been, and still often are, managed as a commons by groups of local users (Agrawal, 2001; Dietz *et al.*, 2003; Ostrom, 2000).

According to international law, the concept of a “common heritage of humankind” adds another layer of complexity to common property. There is some ambiguity in the global regulatory agreements related to PGRs as to whether or not they have ever been a “common heritage”. The *International Undertaking on Plant Genetic Resources* (IU) of 1983 refers to PGR as a “heritage of mankind”. While the 1989 resolutions added to the IU refer to PGR as a “*common* heritage of mankind”, the 1991 resolution again drops the term “common” in favour of “mankind’s heritage”.¹ In this article we have not used the concept of “common heritage”,

however, because in its full international legal sense, the term implies the presence of important elements that have never been part of the international regulation of PGR (Baslar, 1998).² In particular, the governing regime of the PGR as enshrined in the IU lacked a clearly appointed international management authority and an obligation to share the benefits of resource use (Birnie and Boyle, 2002). The use of the concept of “common heritage” in the IU, therefore, does not correspond to the scope of the term in international law (Baslar, 1998). PGR, before the addition of the first Annex to the IU in 1989, can more accurately be thought about as having comprised a “global commons” (Safrin, 2004).

In a *global commons*, unlike most common property regimes, non-members are theoretically non-existent. Everyone shares the resource and the resource is available for the use of all. While this kind of all inclusive commons is exceptionally rare for *tangible* resources, the situation is somewhat different for intangible or intellectual resources for reasons that will be discussed further below (Drahos, 2006).

A stigma has, however, accompanied the seemingly unruly notion of common property since Garrett Hardin made it the subject of a “tragedy” (Hardin, 1968). Using grazing pastures as an example, Hardin argued that a rational user of a commons would seek to maximize their own gain by extracting as much of the resource as possible for their benefit without regard for the costs imposed on other users. Pursuing this behaviour, every individual’s actions would lead to resource overuse and eventual depletion (the “tragedy”). The solution, according to Hardin, lies in the allocation of rights as private or public (state) property (Hardin, 1968). A growing volume of ground-based evidence and scholarly work has, however, shown that users of commons have devised institutional arrangements and governance regimes that are sustainable for long time periods, allocate resources equitably and minimize efficiency losses (Agrawal, 2001; Dietz *et al.*, 2003; Ostrom, 2000). PGR as a global commons is, therefore, not necessarily an unachievable utopia. Additionally, in the specific case of PGR, the prioritization of the “intangible” aspects of these resources over their tangible instantiations means that systems of governance must be structured differently from those of purely tangible resources like timber or water.

PGR as Informational Resources

At a fundamental level, PGRs are *both* tangible and intangible resources. As tangible resources PGRs comprise sexual and vegetative seeds³ of wild plants and any cultivated variety (primitive, obsolete, in use, elite and hybrid lines) that contain “genetic material of actual or potential value”.⁴ As Robert Tripp (1997) points out, however, seeds have been used by farmers as both a renewable physical input and as germplasm (“a collection of genetic information”) for a very long time (p. 19). What this means is that even before the discovery of DNA—even without understanding the sources of heredity, let alone being able to isolate and directly modify genetic material—the germplasm of plants has been a vital resource for farmers and

breeders, the basis of their ability to select for and enhance the transmission of hereditary traits between generations of crops (Herdt, 1999, p. 4). While, as a physical object, seeds are a limited resource and susceptible to erosion and depletion that may result from environmental factors and/or human mismanagement, this situation changes in important ways when one considers seed as germplasm.

The term “germplasm” refers to the physical genetic material (the DNA) that contains the information (or “code”) of the inherited traits of an organism. Although physically delimited, germplasm is primarily an informational resource.⁵ In a basic working model the transmission of information contained in the genetic code is as follows: DNA is converted (transcribed) into a strand of a messenger molecule called mRNA, which is then used to build the strings of amino acids that form the proteins, the most essential molecules in the metabolism of an organism, in a process called translation. This apparently straightforward model of informational flow (DNA → mRNA → protein) does not, however, reflect the diverse information patterns of the genetic code. There are many ways to “read” the information contained in DNA during the transcription and translation processes. What is more, other molecules can alter DNA information.⁶

In the global regulation of the ownership of PGR, tangible biological components have now become largely irrelevant. Instead, the regulation of the information that they contain has taken centre stage. As Sabrina Safrin (2004) has put it:

While genes have a tangible component (i.e., a miniscule combination of chemicals), they share more in common with an intangible good like information than they do with a typical tangible resource like oil. What holds value and is really being sought is not so much a particular physical cell as the information, the blueprint, contained in that cell and, in fact, in millions of similar cells (p. 664).

This use and ownership of PGR as informational goods has taken on huge importance in recent decades as these resources have become more and more valuable, both as objects of IP in their own right, and as inputs into future innovation and product development. In line with this legal and economic prioritization, in this article we have limited our discussion to the international regulation of PGR as an informational or an intellectual resource.

In contrast to their physical instantiations, as informational resources PGR are fundamentally “non-rival” and “non-excludable” (Drahos, 2004a). The first of these two characteristics—being non-rivalrous in consumption—means that one person’s use of the good does not interfere with another’s ability simultaneously to make use of it. A second general, and closely related, characteristic of PGR (and any other intangible property) is that they are non-excludable, which means that it is impossible or at least very difficult or costly to allow some people to use them while excluding others.⁷ By virtue of these two characteristics, PGR does not suffer from the tragic overuse that Hardin argued might occur in common property regimes. Hardin’s tragedy and most of the examples provided by commons scholars

relate to tangible resources—irrigation systems, fisheries and pastures. The stock and the units of such resources are identifiable, amenable to quantification and, most importantly, limited. It is this latter feature that makes tangible resources susceptible to depletion through overuse.⁸

PGR as Global Commons

In light of the non-rivalry and non-excludability of PGR, it is clear that these resources are by their nature difficult to contain. PGR are resources that are, in important ways, “open” to public use and sharing. Unlike some tangible resources that are depleted through use, these genetic resources (and informational resources more generally) actually grow through people’s use, in particular, through their combined skill and effort. As Drahos (2006) has put it, “[r]epletion through use rather than depletion is what characterizes the intellectual commons” (p. 3). Furthermore, as Brush (1999; 2005) has argued, agricultural practices and the specific cultural and environmental conditions within which they take place necessitate a fairly high degree of mixing and commingling of genetic resources to continually meet changing local needs. In the case of agricultural genetic resources, diverse and open use has been a very large part of the production of biodiversity on which past, present and future agricultural productivity rest. According to Brush (1998):

The lack of possessive individualism among peasant farmers regarding seeds and genetic resources might be seen as an adaptive cultural trait in the face of the risks in agriculture and the importance of diversity in meeting those risks . . . A result of the value of diversity and the need to acquire new seed is that seeds flow frequently and freely within and among villages . . . The efficacy of peasant seed systems is the fact that particularly good cultivars spread rapidly and over a very wide area (p. 761).

As previously stated, until the late twentieth century, PGR constituted a global genetic commons. This open sharing of genetic diversity was (and in many parts of the world still is) a fundamental part of agricultural productivity.

In characterizing this situation as a global commons we are not intending to present an image of a homogenous space of universal, unrestricted and equal access. As Chander and Sunder (2004) argue, this “romantic” notion of the commons covers over important distributional inequities. In reality, “differing circumstances—including knowledge, wealth, power, and ability—render some better able than others to exploit a commons” (p. 1332). These kinds of inequities were surely present in the global genetic commons that existed before the 1980s. As such, it makes sense to understand this “common space” as a set of interlocking spaces, each with its own system of governance and rights of access and alienation, some more equitable than others.

What combined these disparate spaces into a *global* commons, however, was the overriding consensus that seeds—at least in the quantities necessary for

research, breeding and the distribution of valuable germplasm—should be freely shared, “the only cost associated with their acquisition being the expenses of collection” (Kloppenborg, 2004, p. 152). While it has clearly never been the case that PGR has been shared in a completely universal and free manner, before the twentieth century there existed no international (and few domestic) regulatory systems to restrict its movements, and the overwhelming tendency among both farmers and scientists was to make germplasm of plant varieties freely available to others (Brush, 2003; Zeven, 1999).

This situation, however, brings into focus another important concern in relation to an understanding of PGRs as common property. Namely, the fact that the rhetoric of the commons has often been deployed as part of an effort to invalidate the traditional claims of use and ownership of particular groups of people. Again, Chander and Sunder (2004) make this situation clear when they note that:

for centuries the public domain has been a source for exploiting the labor and bodies of the disempowered—namely, people of color, the poor, women, and people from the global South. Native peoples once stood for the commons. But in the advent of an awareness of the valuable genetic and knowledge resources within native communities and lesser developed nations, the advocates for the public domain—and, in turn, propertization—have flipped. Now, corporations declare the trees and the shaman’s lore to be the public domain, while indigenous peoples demand property rights in these resources (p. 1335).

Our goal in this article is not to further contribute to this undermining of indigenous people’s claims, but rather to introduce some clarity and specificity into discussions of “the genetic commons”. When this is done, it will, for example, become more clear why many groups of people are no longer advocating common property in genetic resources. One of the simplest answers to this question is that the commons has, in recent decades, been transformed from a space in which resources were, by and large, open to all and could not be enclosed by any individual, to a space in which resources are readily available for appropriation by commercial interests in a way that limits and sometimes prohibits the rights of other users. These are markedly different situations—discussed in detail below—both of which, however, are often simply referred to as “the commons”. In the remainder of this article we will explore more fully the series of events that has led to our current situation. Before doing so, however, we first need to consider some of the various *types* of common property regimes.

Defining the Commons

Peter Drahos (1996; 2006) has argued for more clarity in discussions of common property and to this end has distinguished between four basic commons configurations. In this article we have primarily utilized Drahos’ terminology and

classificatory system, supplementing it where it proves helpful with the work of Elinor Ostrom (2000). Drahos' (2006) four common property regimes are based around two key distinctions: that between the positive and the negative, and between inclusiveness and exclusiveness.

The difference between a positive and a negative commons is that in the case of the latter resources are owned by no one, and therefore appropriable by anyone, whereas in a positive commons resources are owned by everyone, and therefore cannot be alienated by any individual without the consent of all others.⁹ The second key distinction in Drahos' classificatory schema is between an inclusive and an exclusive commons. In the case of the former all individuals, regardless of "geography, race or culture" would be included—a situation that Drahos (2006) acknowledges is rare for tangible goods, but less so for intangibles because of their non-rivalry in consumption. An exclusive commons, on the other hand, is one in which only a particular group of people are included. Ostrom (2000) has cast this distinction as one between "open access" (inclusive commons) and genuine "common property" (exclusive commons). Drahos' four general common property regimes emerge from the combination of these two distinctions: Negative Inclusive, Negative Exclusive, Positive Inclusive and Positive Exclusive.

In addition to these four common property regimes, Drahos identifies the intellectual "public domain" as a residual category of IP law. The public domain contains resources that are not protected at all, as well as materials whose protection term has expired (Litman, 1990). Everyone can make use of these resources because they are completely unmanaged (Benkler, 1999; Boyle, 2003). While the borders between the public domain and common property regimes are often blurry and unclear, we maintain a general distinction between these two domains on the basis that common property regimes are in some sense active social projects that are *managed and built by diverse peoples in diverse places*, where use rights over resources are in some sense overseen. As Drahos (2006) puts it, the public domain:

draws its meaning from the laws of intellectual property, while the [commons] . . . is a political expression of community when it comes to social arrangements for use rights over information (p. 5).

This contrast is most clear when the public domain is compared with an active, positive commons like the one being built by various open-source movements. In this context there is an important distinction between information that is simply released into the public domain—to be made use of and potentially enclosed by another—and information that is licensed under a General Public Licence (or similar), so that it is actively held open for public use (through the establishment of terms and conditions of use set out in the licence) (Boyle, 2003; Drahos, 2006).¹⁰

Commons and public domain are, therefore, overlapping spheres. Commons projects draw on and give back to the public domain, often networking together diverse resources. The borders between these two domains (as well as those with

private properties) are, however, fuzzy and complex, full of leaks, ambiguities, movements back and forth and myriad interdependencies (Samuelson, 2003).

The Shifting Commons in the International Legal Arena

IP in agricultural genetic resources had a very modest beginning. In the 1920s, thriving horticulturalists and seed companies in the United States lobbied their government for the creation of a national regime to protect plant varieties. The US Plant Patent Act 1930 was the result. This act only allowed protection for vegetatively propagated crops (excluding tubers) and was, as such, largely limited to fruit trees, ornamentals and other plants propagated through cuttings. The act does, however, mark a point in history at which plant variety development and production was taking shape as a commercial industry (Le Buanec, 2004). Commercial European breeders shared this emergent trend in agriculture and saw in plant variety protection (PVP) a means for economic growth and development (Joerdens, 2005).

International Convention for the Protection of New Plant Varieties (UPOV)

The first formal agreement to regulate PGR at an *international* level was the International Convention for the Protection of New Plant Varieties (UPOV) in 1961. This Convention was adopted primarily through the action of the then International Association of Plant Breeders for the Protection of New Plant Varieties (ASSINSEL, French acronym) and the French government (Le Buanec, 2004).¹¹ The aim of UPOV is to provide a form of IP, usually called a Plant Breeders' Right (PBR), which allocates ownership to breeders for commercial plant varieties that are deemed to be new, distinguishable, uniform and stable. All UPOV Acts (1961, 1978, and 1991) confer exclusive rights upon breeders to produce commercially, offer to sale and market the protected plant variety.¹² The 1991 Act has extended the breeders' rights to include more than the original protected plant variety conferring protection to "essentially derived varieties",¹³ a concept whose implication is analysed in further sections (see "IP Expansion"). Investment safeguards, commerce and marketing were in 1961, and still are, the primary reasons for the standardization of IP protection for commercial varieties at an international level.

UPOV is a highly significant agreement in the historical evolution of common property in PGR. Before this Convention, there was no practical way in which to remove PGR from the global commons (Figure 1A). IP in genetic resources was not available and so they remained open to the use of all but unable to be alienated/appropriated.¹⁴ With the passing of UPOV and later an equivalent US Act—the Plant Variety Protection Act 1970 (PVPA)—a means of enclosing germplasm and excluding others from its use emerged. These PVP systems, therefore, effectively transformed PGR from positive to negative common resources. In other words, while germplasm remained open to all to use, it could

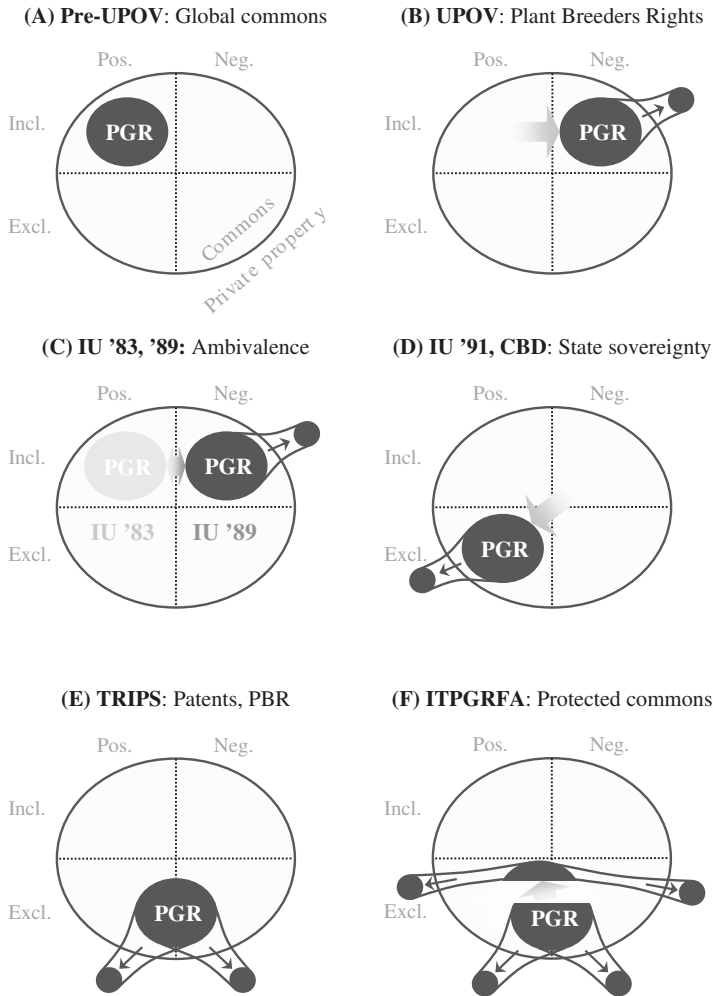


Figure 1: How international treaties have shifted PGR through various common property spaces. Here we depict the way in which the PGR commons has changed in each regulatory instance, creating a gradual progression towards a smaller and more exclusive common domain. The larger space of the commons is divided into four quarters in line with Drahos (2006). The movements of the circle labelled “PGR” accompanied by the thick arrows represent the changing nature of the common space occupied by PGR under each of the regulatory systems. The smaller circles together with the thin arrows—outside the common space—represent the PGR that can now be drawn off and privately owned. The figures are best understood alongside the relevant sections of this article.

now be removed from the common space and made private through IP protections (Figure 1B).

The PGR protected through PVP regimes has, however, maintained a degree of openness to public use through the existence of exemptions that have allowed

farmers to save seed for use on their own property and allowed breeders and researchers limited usage rights (UPOV, 1961: 5; 1978: 5; 1991: 15; PVPA: 113–4) (Brush, 2003).

Fundamentally, these PVP regimes rest on a distinction between “raw” and “worked” PGR in which only the latter are eligible for protection (because they meet the UPOV and PVPA criteria of being distinct, uniform, stable (DUS) and novel (UPOV: 5.1, PVPA: 42)). During the 1970s, however, this distinction became a point of tension in international discussions (Rubenstein and Smale, 2004). Developing countries were increasingly finding that germplasm that had been developed and cultivated by farmers within their borders was freely travelling overseas as a common resource, only to be utilized in commercial plant breeding and then sold back to them as a protected variety (Kloppenborg Jr, 2004; Rubenstein and Smale, 2004; Whatmore, 2002).

International Undertaking on Plant Genetic Resources (IU)

It was the perceived inequity of this situation that gave rise to the IU in 1983. The UN Food and Agriculture Organization (FAO) convened the IU in an effort to forestall the contraction of the global commons in PGRFA.¹⁵ The Undertaking’s aim was to provide unfettered access for all to any type of PGRFA,¹⁶ including those that UPOV and any PVP regime had made private (IU: 2.5). Within the context of the terminology used here, the Undertaking attempted to effect a move back to an inclusive positive commons, in which germplasm could not be made private.

The IU never became a legally binding agreement. Despite this fact, many countries (113) as well as the international agricultural research centres of the Consultative Group on International Agricultural Research (CGIAR) and many national seed collections adhered to its key principle of free and unencumbered availability of PGRFA for conservation, research and development (R&D) and breeding.¹⁷ This principle embodied the *modus operandi* of those involved in public breeding for food and agriculture.

Ultimately, however, the undertaking’s attempt to move PGR into an inclusive-positive commons was largely unsuccessful. Subsequently, three annexes were added to it, reshaping the common genetic space that it had attempted to define. In 1989, the first of these annexes (Resolution 4/89, article 1) provided an “agreed interpretation” of the agreement that quite clearly states that UPOV-style PVP is not incompatible with the Undertaking. The Undertaking’s attempt to remove the enclosure around “special genetic stocks” failed. With this annex the negative character of the PGR commons was forcefully reaffirmed (Figure 1C).

Amidst the losses, however, there were some gains for the global commons. The second annex, also added in 1989 (Resolution 5/89), spelled out the concept of Farmers’ Rights, which were an attempt to address some of the imbalance created by PVP systems (Brush, 2005; Correa, 2005). But the gain was a small one. Today, almost two decades later, Farmers’ Rights are still largely a rhetorical concept

(Brush, 2005)—much like the benefit-sharing systems of the 1990s (Brush, 2005; Carrizosa *et al.*, 2004)—while the private property regimes that they were established alongside continue to be broadened and “ratcheted up” (further discussed below). Ultimately, the 1989 resolutions annexed to the IU helped to cement a divide between “raw” materials that were deemed to be part of the global commons and “worked” materials that could be legitimately enclosed through PVP regimes.¹⁸

The third annex added to the Undertaking, however, had an arguably even more significant impact on the shape of the genetic commons than any of these previous agreements. Resolution 3/91 begins with the somewhat contradictory statement that:

the concept of mankind’s heritage, as applied in the International Undertaking on Plant Genetic Resources, is subject to the sovereignty of the states over their plant genetic resources.

In this single sentence, the Undertaking ushered in a new era of PGR ownership and management, which, the following year, was to be expanded in the Convention on Biological Diversity (CBD) to take in all non-human genetic resources, not just those of plants.

Convention on Biological Diversity (CBD)

The CBD was signed at the Earth Summit in 1992 and is a legally binding international agreement on the conservation and sustainable and equitable use of genetic resources (CBD: 1). Although it is often heralded as a major international agreement on *conservation* (McGraw, 2002)—to “sustain life on earth” and “promote nature and human well-being” (CBD website, 2007)—the chief objective and underlying concern of most developing countries involved in negotiating the CBD was to control access to biological resources in order to better regulate their genetic components and so be able to capture benefits from the use of these resources (Glowka, 1998).

The CBD is broader in scope than either UPOV or the IU. While it includes PGRFA, its scope extends to the genetic resources of all biological organisms (CBD: 4).¹⁹ The effect of this broad scope was immediately felt in the IU. The CBD acknowledged the special character of PGRFA and called for understanding and mutual support between the Convention and FAO’s Global System for the Conservation and Sustainable Use of PGRFA, whose Commission on PGRFA (later renamed Commission on Genetic Resources for Food and Agriculture) administered the IU.²⁰ In the end, the IU was amended to give credit to the Convention.

The most significant aspect of the CBD for the international regulation of PGRFA is the way in which it repositioned biological and genetic resources as the property of sovereign nation states and gave these states the authority to determine access to “their” resources (CBD: 3, 15.1) Although this movement had been made (for PGRFA) in the Third Annex to the IU one year previously (1991), because of

its broader biological/genetic scope and its legally binding nature, this aspect of the CBD is very significant. In the CBD, therefore, nation states established a new property domain in genetic resources at an international level: a domain limited and ruled by state sovereignty. Post-CBD, people wishing to gain access to genetic resources must negotiate with the source country/community of the genetic resource to ensure an equitable return of benefits arising from use of the resource. This situation has, quite understandably, created numerous problems in determining what an adequate “return” might be, what form it should take, and precisely whom it should go to.²¹

In light of these changes, some scholars have understood the CBD to have created a protected sphere of common property, a biodiversity commons to counterbalance the private IP domain (Linarelli, 2004; Straus, 2000). This reading is overly simplistic. The common spaces that the CBD has created are, in reality, nation-state sized islands of genetic common property. Within the context of Drahos’ classificatory schema, they are “exclusive positive commons”. They are *exclusive* spaces because the CBD allocates sovereign rights to these resources to a specific “group”—namely, the nation state. Additionally, they are *positive* spaces because the CBD undermines practices of free appropriation, and requires that users obtain the consent of the common-owners. This reconfiguration has not altered existing IP regimes that allow these resources to be privately enclosed, but made private resource enclosure subject to prior informed consent and mutually agreed terms. Consequently, it has become more difficult—at least for those who respect these requirements—to remove PGR from the now exclusive common spaces that they occupy. The role played by nation states through the exercise of sovereignty has, therefore, heightened the exclusive character of the islands of common property created by the CBD (Figure 1D). Post-1992, in practical terms many nation states have become “gatekeepers” of PGR in a way that undermines the common character of these resources by implementing very strict sovereignty-based regimes for access. This situation is discussed in more detail below.

Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)

While UPOV, the IU, the CBD and their agencies were carving out their own niche, the TRIPS was preparing for its international debut. TRIPS is a multilateral agreement that in 1994 introduced three radical developments in IP. First, it established minimum standards for most IPR (except PVP rights) for all nation members of the World Trade Organization (WTO) (Correa, 1998). Second, TRIPS connected IP standards to trade and the tools of trade enforcement (for example, using WTO dispute settlement mechanism) (Drahos, 2004b). Third, TRIPS globalized and in many ways normalized the investment and traders’ credo that knowledge can be a legitimate private good (Drahos and Braithwaite, 2002).

The major influence of TRIPS on PGR is through patents and *sui generis* form(s) of protection. TRIPS provides for the patent protection of any invention—products or processes—in any field of technology (TRIPS: 27.1). These forms of

property have now been routinely extended to genetic resource-based inventions in one form or another in most countries (CIPR, 2002; Koo *et al.*, 2004). The chief concern of TRIPS is the presence of a uniform legal and policy infrastructure for IPR in each WTO country. Its overarching structure and its links to trade, however, mean that actions under, and possible amendments to, other international agreements on PGR—like the CBD and the International Treaty on Plant Genetic Resource for Food and Agriculture (discussed below)—are highly influenced by TRIPS.²² It is, however, important to note that the influence among international regimes goes in more than one direction. Serious debates over proposals for the introduction of changes to TRIPS have had their origin in the CBD.²³

Ultimately, the TRIPS Agreement fails to acknowledge the *positive* character of the exclusive commons defined by the CBD. It fails adequately to take into account prior informed consent and mutually agreed terms when it comes to accessing biodiversity-related resources for use in patentable products and processes. In short, TRIPS treats genetic resources *negatively*, as resources open to appropriation by anyone. In effect, therefore, there are now two somewhat distinct ways privately to appropriate PGR, two pathways out of the genetic commons. The first treats PGR as a positive resource and moves through the sovereign gatekeepers established by the CBD. The other ignores these requirements and privately appropriates PGR without any consent from the relevant internationally recognized “common” property owners (Figure 1E).

Through these two pathways, the expanding private IP domain has been able to draw resources from the commons to the extent that the latter is now significantly shrinking in size and content. Contradictorily, the growth of IP relies in great part on the existence of these open access and common spaces. If the current trend continues, we may be witnessing the depletion of informational resources, but not because of overuse. Rather *underutilization* of PGR as a result of restrictive access and use regimes may cause a reduction in PGR-associated innovation and product development. This situation has been called a “tragedy of the anticommons” (Buchanan and Yoon, 2000; Heller and Eisenberg, 1998; Hope, 2004).

International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

By the late 1990s, access and use of PGRFA had been limited by both sovereignty and IP claims. The ITPGRFA entered into force in 2004²⁴ with the goal of implementing an international multilateral system of access and benefit sharing for the germplasm of selected important crops, related knowledge and technologies.²⁵

Members of the ITPGRFA have a commitment towards fellow members to facilitate access to a select group of PGRFA²⁶—in *in situ* and *ex situ* conditions—provided that the resources in question are “under the management and control of the Contracting parties and in the public domain.”²⁷ That is, the Treaty breaks off a small subset of common (state regulated) PGR resources, and attempts to

transform the way in which they are managed. In particular, it has attempted to build channels between the sovereign islands of PGR resources established by the CBD. In place of these exclusive sovereignty regimes, the Treaty has established a more inclusive space in which a larger group of users (institutions located in member nations to the Treaty and IARCs) have facilitated access to specific PGR. For institutions located in non-member states, however, either the CBD's rules or other national access and use rules may apply for the same PGRFA. These rules also apply for all other non-selected PGRFA for both members of the ITPGRFA and non-members. The Treaty, therefore, creates a *more inclusive* commons for a select group of genetic resources, but a commons that is ultimately still exclusive.

On the surface, this exclusive commons appears to be thoroughly positive in character. That is, it appears to be a protected space from which resources cannot be removed (either without the consent of all commoners, or at all). A closer look at the Treaty, however, reveals that the created commons is still a negative one. The ITPGRFA needed to accommodate and recognize other property spaces: state sovereignty-based and exclusive property rights (IP and otherwise). The Treaty scored a success where countries in exercise of their sovereign rights decided to place selected PGRFA under the multilateral system.²⁸ Consequently, the sphere of a protected commons increased once again to the benefit—hopefully—of farmers and public crop R&D. The compromise reached in terms of IP, however, is not entirely satisfactory. IP claims and restrictions are prohibited for all PGRFA “in the form received” through the multilateral system (ITPGRFA:12.3d). The implications are that PGRFA held in this system but deemed to be out of the received form (such as isolated and modified genetic resources) may well be appropriable through IP systems (Fowler *et al.*, 2003; Helfer, 2005). Thus, the resources covered by the ITPGRFA have the same potential as all other PGR to be interpreted negatively and therefore privately appropriated without the consent of other commoners (Figure 1F).²⁹

The ITPGRFA is a step towards restoring the channels and networks of access and use of PGRFA. The different types of enclosures erected by UPOV, the CBD and TRIPS have effectively reduced the size and form of the global PGR commons. Learning from the experience with the IU, the ITPGRFA advocates a protected commons monitored and coordinated by an intergovernmental governing body and a secretariat.³⁰ This commons of a reduced number of PGRFA will, however, require active regulatory surveillance to avoid the dents that exclusionary regimes might inflict on it. Despite its shortcomings, the ITPGRFA represents a first step in the renewal of the ruptured conduits in national and international public R&D on PGRFA.

Shifting Property Spaces on the Ground

Analysis of the relevant international agreements does not provide us with an entirely accurate picture of the shifting common spaces of agricultural PGR.

Differing processes of implementation and broader legal and political trends have impacted on the form that common property in PGR is now taking on the ground. The implementation of international regulatory regimes in agricultural PGR in any specific locality is a matter of empirical analysis. Local context and tradition is everything when it comes to understanding how international rules for PGR actually operate. In this section we offer some general observations about areas in which the “on the ground” reality of the configuration of common, state and private property is not quite, or at all, what the international regimes imply.

Sovereign Islands

By law the CBD proclaims a commons regulated by the state, a space where genetic resources “belong to the public and are open to the public by operation of law” (Rose, 2003, p. 96). However, under the CBD, in practice, what constitutes “the public” has shrunk to the point that access and use of genetic resources is denied to some PGR stakeholder groups (e.g. scientists who engage in R&D of genetic resources). In reality, the hundreds of sovereign islands of genetic resources created by the CBD often host isolated islanders—in the form of scientists who are unable to use the resources in full and have had their network channels shattered.

Ironically, the greatest loser in all this is the national public R&D system for biological and genetic resources. Evidence of this phenomenon comes from Brazil, India and the Andean countries.³¹ In all these countries, the state has promptly moved to adopt CBD-based national legislation on access and benefit sharing (Dávalos *et al.*, 2003).³² However, overregulation by rules appears to be a common factor in the legislative and policy schemes of these nations. Restrictive control and burdensome and uniform access rules apply regardless of the user (e.g. students and companies), the type of resource (e.g. food crop resources and pharmaceutical resources) and the intended use (basic studies and commercial research (applied biotechnology)). At the same time, access and benefit-sharing agreements tend to overemphasize monetary benefits, which are not always commensurate with the type of resource accessed and the use given to it, and tend to be decided upon by state authorities regardless of the terms mutually agreed between the direct provider and user of the resource (Bawa, 2006; Carrizosa *et al.*, 2004; Prathapan *et al.*, 2006; Ruiz Muller, 2003; Zerda Sarmiento, 2005). Outcomes from these developments are relatively consistent in these countries: low instances of access through official access regimes;³³ reduction of biocollections (even for educational purposes);³⁴ and the absence of sought-after monetary benefits.

Unlike scientists, farmers do not appear to have had restrictions imposed by the CBD-derived national regimes on their customary use of biological resources and related knowledge. However, discord has emerged with respect to benefit sharing and ownership of resources and land tenure. As states exert sovereign ownership over genetic resources, those who hold/own/conservate biological resources are confined to a mere provider role with symbolic participation in access and benefit-sharing agreements. The potential primary beneficiary is the resource owner—the state

(Dávalos *et al.*, 2003). Inequity concerns are likely to arise when the state does not have the best interests and needs of local communities at heart (Bragdon *et al.*, 2002).

A Commons for Selected Crop Resources

As we have seen, at least for a subgroup of resources, the Multilateral System of access and benefit sharing of the ITPGRFA is aimed at building channels between these islands of users through a protected commons. The positive side of this situation is that a reduction in complexity in accessing resources makes this commons more inclusive and thus open for both public and private breeding.³⁵ The ITPGRFA, like its predecessor the IU, attempts to be responsive in its regulatory structure to the interconnectedness of stakeholders and the use of PGRFA of multiple types and origins in the R&D of crops. The potential negative side of this equation, despite the ITPGRFA's attempts to maintain a select group of PGR as a positive commons, is that this reduction in complexity (and sovereign gatekeepers) might, through its easing of the movement of PGR, facilitate the flow of these resources out into the private domain.

The Standard Material Transfer Agreement (SMTA) is the main regulatory tool of the protected commons of the ITPGRFA. The recently agreed upon SMTA³⁶ creates a system of facilitated access for the selected PGRFA in a multilateral agreement that includes the UN FAO as a third party.³⁷ Controversy still surrounds the SMTA with regard to two main issues, namely: the voluntary and compulsory schemes proposed for monetary benefits to be paid to the Multilateral System,³⁸ and the possibility of recipients making IP claims over materials derived from those acquired from the Multilateral System.³⁹ As noted previously, with respect to the latter it is possible that materials provided through the Multilateral System might find their way into patents in countries that allow the patenting of isolated and unmodified genetic sequences (Fowler *et al.*, 2003; Helfer, 2005). This kind of patenting might effectively reduce the freely useable contents of the PGRFA commons created through the Multilateral System of the ITPGRFA.

Within the context of the sovereign islands of PGR created by the CBD, neither the desired benefits in exchange for access, nor increases in research and development, have yet been realized to any substantial degree. It is still too soon to say whether the “protected” commons of the ITPGRFA will deliver on these grounds. In addition to these considerable problems in access, it is clear that IP private domains are *further* fragmenting the active spaces of common exchange of PGR. The way in which IP private domains have been superimposed on the sovereign islands created by the CBD has further undermined the flow of PGR and ultimately affected research and development in this area. The “on the ground” situation with regard to IP in PGR, however, is even more restrictive than the international context may make it appear.

IP Expansion

Increasingly, there is a trend in both the international and most national contexts towards more and more expansive IP regimes. This situation has occurred in large

part through the introduction of the TRIPS, which, as discussed previously, globalized and normalized a minimum standard for most IP rights and a trade-based enforcement regime. In recent years, however, the regulation of IP at an international level has increasingly moved outside of the WTO/TRIPS arena. In the face of increased resistance in the Council for TRIPS, bilateral Free Trade Agreements have become a central part of the US government's attempts to strengthen and harmonize global IP systems (Drahos, 2004b). The US government's desired level of protection abroad, however, is in line with its own domestic IP law, which is both broad in terms of its interpretation of patentable subject matter and highly monopolistic in terms of the protection that it provides (Drahos, 2004b).

This new emphasis on bilateralism has been an important part of the "ratcheting up" of minimum IP standards all over the world (Drahos, 2004b; GRAIN, 2005; Maskus, 2004; Musungu and Dutfield, 2003). Patents on modified genes and genetically modified plants are now allowable in most countries, even in developing countries. Furthermore, patent protection on genetic products often extends to all material, except the human body, in which the product is incorporated (Agris, 1999; CIPR, 2002; Koo *et al.*, 2004; Le Buanec, 2004).

Although there may appear to be a great deal of flexibility in the international IP regimes in agricultural PGR, on the ground, this is far from being the case. For example, article 27.3(b) of the TRIPS allows for the exclusion of plants and animals from the sphere of patentability, but requires that countries choosing to do so must provide a *sui generis* system for the protection of plant varieties. In countries that have opted to exclude plants and animals from patentability, however, there is good reason to suspect that this may not actually amount to exclusion in practice. This is, for example, the case in Canada where higher life forms are technically not patentable subject matter following a 2002 ruling in *Harvard College v Canada* (Commissioner of Patents), 2002 SCC 76. In 2004, however, the Supreme Court of Canada's controversial ruling in *Monsanto Canada Inc. v Schmeiser* 2004 SCC 34 interpreted a patent on a gene and a cell so broadly that any use of the higher organism (plant or animal) containing them became an infringement of the patent. At least in Canada, therefore, the ability to exclude plants and animals from patentability is virtually meaningless while genes and cells are still patentable (DeBeer, 2005).

As regards the possibility of utilizing a *sui generis* system in place of patent protection (for plant varieties at least), work by the Spanish NGO GRAIN has shown that this possibility is consistently being reduced to the adoption of UPOV (or UPOV-style) protections (GRAIN, 2004).⁴⁰ This lack of diversity in the adoption of *sui generis* systems is particularly important in light of the fact that the protection granted to PVP owners under the UPOV system is becoming increasingly similar to that of a patent regime. In the 1991 version of UPOV, the above-noted farmers' and breeders' exemptions have been either removed or greatly weakened. The farmer's exemption is no longer a requirement but is placed at the discretion of each UPOV member. Similarly, UPOV 91 introduced

the concept of an “essentially derived variety” and excluded these varieties from those that breeders are able to produce and market on the basis of protected varieties (Salazar *et al.*, 2006; Tansey, 1999). In recent years, the seed industry has sought to further limit the breeder’s exemption by the introduction of delayed periods of access to newly developed varieties, alleging lack of incentives to innovate and invest in breeding activities (Donnenwirth *et al.*, 2004; Le Buanec, 2004)

The overall IP landscape is, therefore, becoming increasingly restrictive. The internal strengthening of the protection offered by PVP regimes is an important part of this movement. In the past, PVP regimes have arguably offered a more balanced approach to IP in agricultural genetic resources—in large part precisely because of these exemptions. In addition to their internal strengthening, however, PVP regimes are now often being abandoned by IP owners in favour of utility patents. Mark D. Janis and Stephen Smith (2006) have argued that in light of advances in genetics and changes in IP law, PVP regimes in general are becoming obsolete.

In short, minimum IP standards are being generally “ratcheted up” through increases in their scope and duration and the removal or weakening of any exemptions. Ultimately, both common and sovereign PGR spaces are contracting in the face of an expansive private domain.

Conclusions

The international legal instruments related to PGR do not regulate a single property domain in isolation. The interplay between various spaces of private and common property means that in addition to restructuring property domains in the foreground, each of these regimes also redraws the boundaries and content of the domains remaining in the background. Through the control of a domain ruled by sovereign ownership, the CBD reshapes and transforms the global genetic commons (the backgrounded domain). Likewise, UPOV and TRIPS regulate the private IP domain directly, but in so doing reshape and modify the public and commons domains.

IP and sovereignty-based spaces are expanding at the expense of positive and inclusive common and open spaces. Both the sovereign and the private-IP domains are exclusionary in character, often fencing off resources for the use of a privileged few. The possibility of obtaining and accruing benefits from the use of PGR appears to be the driver of both sovereignty- and IP-based property regimes. Either the lure of benefits or a contestation of power—or, alternatively, a mixture of both—is fuelling an escalating ownership trend characterized by increasingly restrictive access in these two types of property spaces. While, on paper, these private and sovereign property regimes appear to be very different—in terms, for example, of potential beneficiaries and the freedom of movement of resources—on the ground, these differences are often far less clear.

The dynamics unleashed by IP and sovereign regimes are transforming the varied common spaces, with their multiple modalities of access, use and alienation

of resources, into a *de facto* homogeneous commons space where the negative and exclusive characteristics are predominant. This is a highly undesirable outcome if our true goal is the conservation and sustainable use of PGR for the well-being of society at large.

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Notes

- 1 First paragraph of Agreed Interpretation of the International Undertaking, resolution 4/89 Twenty-Fifth Session of the FAO Conference, Rome, 29 November 1989; first para (a) of Resolution on Farmers' Rights, resolution 5/89 Twenty-Fifth Session of the FAO Conference, Rome, 29 November 1989; and first para (a), resolution 3/91 Twenty-Sixth Session of the FAO Conference, Rome, 25 November 1991.
- 2 The earlier international agreements using the concept of common heritage of mankind are the Agreement Governing the Activities of the States on the Moon and Other Celestial Bodies (1979) and the United Nations Convention on the Law of the Sea (1982) (see Baslar, 1998).
- 3 Seed is a generic term for a plant part used for propagation. Sexual seeds, also referred to as true seeds, are the result of ovule fertilization. In contrast, vegetative seeds are vegetative parts of a plant used for propagation. They are the product of cuttings, grafting and tissue culture. Vegetative seeds are also specialized plant structures such as tubers, roots, corms and bulbs that can be used to propagate a new complete plant (see Kozłowski, 1972; Roberts and O'Neill, 2002).
- 4 This definition of plant genetic resources is an aggregate of definitions provided in three international agreements dealing with PGR and genetic resources: the International Undertaking on Plant Genetic Resources 1983 (article 2), the Convention on Biological Diversity 1992 (article 2) and the International Treaty on Plant Genetic Resource for

- Food and Agriculture 2001 (article 2). See further sections for a detailed discussion of these and other relevant international instruments.
- 5 While this “informational” use of seed as germplasm—as a vehicle for the introduction or transmission of traits between generations—has existed since the beginning of agriculture, in the current context the informational rendering of these resources has been heavily reinforced by scientific advances, which have increasingly allowed genetic material to be disaggregated from organisms and represented and used as a “code”. Additionally, the application of IP regimes to genetic resources and the increased role of an information economy in many parts of the world have both played significant roles in the “informational” way in which germplasm is today understood, used, valued and conserved (see Kay, 1995; Parry, 2004; Wright, 1986).
 - 6 Different phenomena contribute to the non-linearity of information in the genetic code. For example, non-coding regions interspersed in coding regions splice in alternative ways, resulting in rearrangements of coding regions. There is also more than one starting point to read the information in the DNA template. In addition, proteins can be assembled from different mRNA molecules transcribed from non-contiguous genes. All the former events generate many more and different molecules than the ones predicted by simply following the DNA sequence. Finally, recent discoveries have shown DNA of plants and mice rewritten based on RNA messages of past generations (see Pearson, 2006a; 2006b).
 - 7 As Drahos (2004a) points out, both the “non-excludability” and the “non-rivalry” are *relative* attributes of objects of property, which can be influenced by specific circumstances or conditions. One of the central problems with these kinds of goods, however, is that while they are often of great benefit to society, the market is unlikely to provide adequately for them. Being unable sufficiently to exclude free riders from their use, consumers are unlikely to choose to pay for the good when they could get it for free. IP provides just such a means of exclusion for intangible goods, and thus creates a new possibility for profit making—and thus private investment in—the development and production of information intensive goods.
 - 8 It should also be noted that in most respects Hardin was simply wrong. He assumed that common spaces are “open access” regimes and thus missed the complex social systems and prohibitions that structure access and use of common spaces in real communities (see Ostrom, 1990).
 - 9 This situation is actually somewhat more complex than this simple characterization implies. As Ostrom has argued, common property rights (like their private cousins) are actually bundles of rights. The five main rights that Ostrom has identified in common property regimes are access, withdrawal, management, exclusion and alienation (Ostrom, 2000). In the case of PGR, as with other intangible objects of property, basic use rights (access and withdrawal) are less significant than they are in some tangible resources because these intangible resources are not depleted through use. In this context, therefore, it is the higher order rights—like management, and in particular exclusion and alienation—that are of greatest significance. In a positive genetic commons, therefore, commoners need not get the consent of all to use a genetic resource, but would most likely need to in order to alienate it or exclude others from its use.
 - 10 The General Public Licence (GPL) accompanies the release of some open-source and free software. The GPL specifies that anyone may copy the software, provided the

- licence remains attached and the source code for the software always remains available. Users may modify the code, add to it, may build on it and incorporate it into their own work, but if they do so, then the new program created is also covered by the GPL. The work is open in the sense that all those who commit to the communal project benefit from the original software and from any innovations done to and with it (see Free Software Foundation, 2007).
- 11 The UPOV adopted the International Convention for the Protection of New Plant Varieties by the UPOV Act 1961, on 2 December 1961.
 - 12 Article 5 of the UPOV Act 1961 and 1978, and article 14 of the 1991 Act define the scope of rights conferred upon the breeder.
 - 13 Article 14(5) of the UPOV Act 1991.
 - 14 Note 9 provides a brief note on the difference between “use” and “alienation”, as described by Ostrom (2000).
 - 15 The International Undertaking on Plant Genetic Resources was adopted at the end of the Twenty-Second Session of the Food and Agriculture Organization (FAO) Conference (resolution 8/83) held in Rome, 5–23 November 1983. The title of the Undertaking was amended to International Undertaking on Plant Genetic Resources for Food and Agriculture to reflect the true scope of the agreement.
 - 16 Types of PGRFA covered by the IU (article 2) refer to the types of plant materials used as resources in crop breeding. These are cultivated varieties (cultivars) in current use and newly developed varieties, obsolete cultivars, primitive cultivars (land races), wild and weed species, near relatives of cultivated varieties and special genetic stocks (including elite and current breeders’ line and mutants).
 - 17 Free and unencumbered availability of resources samples was “on the basis of mutual exchange or mutually agreed terms” (article 5, IU of 1983).
 - 18 Apart from UPOV and the US Plant Patent Act 1930, there were national developments in the United States in the IP area that opened up the possibility of obtaining patent-type protection for biological resources. They contributed to the unrelenting expansion of private IP on PGR and other biodiversity components and to a broadening of the gap between what are considered “raw” and “worked” materials. In 1980, the US Supreme Court in *Diamond v Chakrabarty*, 447, US 303, decided that a genetically engineered microorganism was patentable subject matter. In 1986, the US Patent and Trademark Office (USPTO) granted the first utility patent for a plant after the USPTO Board of Appeals and Interferences in *Ex parte Hibberd*, 227, USPQ 443 (Bd. Pat. App. & Inter. 1985) held that plant materials were patentable subject matter under section 101 of the Patent Act 35 USC. The case concerned a genetically modified high tryptophan corn (see USPTO, 2001).
 - 19 It is not entirely clear from the text of the CBD whether its provisions should apply to human genetic materials (Hayden, forthcoming). The *Bonn Guidelines*, which were agreed upon at the Sixth Council of the Parties to the CBD in 2002, however, explicitly *exclude* human genetic material from their purview (CBD Decision VI/24:9).
 - 20 The Interrelationship between the CBD and the Promotion of Sustainable Agriculture, resolution 3 of the Nairobi Final Act, 22 May 1992.
 - 21 Cori Hayden has discussed and documented many of these problems in her work on bioprospecting and benefit sharing post-CBD (2003; 2007).

- 22 A concern that TRIPS placed private rights above public concerns for health, food security, development and the environment was expressed in the WTO's Doha Ministerial Declaration of 2001. Trade Ministers at this meeting called for a rebalancing of the TRIPS agreement and mandated reviews on the relationship between the CBD and TRIPS and the protection of traditional knowledge. See para 19 of WTO Ministerial Declaration, Fourth Session, Doha, 9–14 November 2001 (Document WT/MIN(01)/DEC/1/) adopted on 14 November 2001. Available online at (http://www.wto.org/English/thewto_e/minist_e/min01_e/mindecl_e.pdf) [Accessed November 2007].
- 23 In early 2006, at the Council for TRIPS, a group of countries led by India and Brazil tabled a proposal for the mandatory inclusion of disclosure of origin of biological/genetic resources and associated knowledge as a requisite for patent applications relating to inventions based on such resources. Disclosure of origin was initially called for in the Bonn Guidelines adopted at the Sixth Meeting of the Conference of the Parties to the CBD in 2002. Thus, disclosure of origin has taken place in the CBD and is influencing TRIPS. The submitted proposal for disclosure of origin is still under debate (Intellectual Property Watch, 2006). For an analysis of the politics of disclosure of origin and the likely implications of the insertion of such disclosure in TRIPS and national IPR regimes (see Chatham House, 2006; Sarnoff and Correa, 2006).
- 24 Currently, 110 countries are members to the ITPGRFA in addition to eleven international agricultural research centres that place their in-trust seed collections under the Multilateral System provided for by the Treaty. See ITPGRFA—Signatures and Ratifications [online]. Available at (<http://www.fao.org/Legal/TREATIES/033s-e.htm>), 6. [Accessed July 2008]. Also see Statement of the Centres of the Consultative Group for International Agricultural Research Regarding Implementation of the Agreements Between the Centres and the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture, 16 October 2006 [online]. Available at (<http://ipgri-pa.grinfo.net/media/1/CGIAR%20Alliance%20statement.doc>) [Accessed November 2007].
- 25 Part IV—The Multilateral System of Access and Benefit Sharing (ITPGRFA: 10–13).
- 26 Annex I, List of Crops Covered Under the Multilateral System, ITPGRFA. The crops correspond to 35 food crops and 29 forage crops.
- 27 Articles 12.1 and 12.2 of the ITPGRFA.
- 28 Preamble, para 11 and article 10 of the ITPGRFA.
- 29 To compensate for the forgone positive inclusive commons, the ITPGRFA requests access to and transfer of technology, as well as, sharing monetary and other benefits from commercialization of IP protected products derived from PGRFA acquired through the Multilateral System (articles 13.2(b) and (d)). Demands of monetary benefits are, however, waived if the IP holder agrees to share the PGRFA-based product for further research and breeding (article 13.2(d)(ii)).
- 30 A governing body and secretariat are provided for in articles 19 and 20 of the ITPGRFA.
- 31 Andean countries here relate to the members of the Andean Pact: Bolivia, Colombia, Ecuador and Peru. Venezuela, a former member of the Pact, announced its withdrawal in April 2006.
- 32 For a discussion of the Biodiversity Act 2002 in India, see Safrin (2004).

- 33 For data on access contracts in the Andean pact countries, see Consorcio GTZ/FUNDECO/IE (2001).
- 34 For the situation of basic research and biocollections in India, see Bawa (2006); for Brazil, see for example Ramalho (2007).
- 35 At the Second Meeting of the Governing Body of the ITPGRFA, the Secretariat reported that around 100,000 transfers by the CGIAR centres have taken place within the first nine months of adoption of the SMTA. See “Implementation of the Multilateral System” (IT/GB-2/07/Draft Report), Second Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture, 29 October–2 November 2007, Rome, Italy.
- 36 Resolution 2/2006 Adoption of the Standard Material Transfer Agreement (contained in Appendix G), 16 June 2006, First Session of the Governing Body of the ITPGRFA, IT/GB-1/06/Report [online]. Available at <ftp://ftp.fao.org/ag/cgrfa/gb1/gb1repe.pdf> [Accessed November 2007]. The SMTA is governed by the UNIDROIT Principles of International Commercial Contracts of 2004.
- 37 The Governing Body of the Treaty formed by all contracting parties (ITPGRFA:19.1) elected FAO as the third party beneficiary in its First Session. See resolution 2/2006 Adoption of the SMTA, numeral 8.
- 38 Article 6.7 and annex 2 of the SMTA.
- 39 Article 6.2 of the SMTA.
- 40 According to GRAIN UPOV-type PVP is “aggressively becoming a blanket reality in the South . . . Half of the developing countries which have adopted PVP laws—and the vast majority only did so in the last few years, because of TRIPS—have also joined UPOV. An additional 26 are currently in the process of joining. And yet another 30 are allegedly seeking UPOV’s advice on the conformity of their draft PVP bills with the UPOV provisions” (GRAIN, 2004).

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