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Intellectual Property Rights and Biodiversity Management: The Case of India

*Philippe Cullet and Jawahar Raja**

The management of biological resources has been an increasingly contentious subject at the national and international levels. This is linked in large part to the progressive recognition of new economic opportunities arising from the use of biodiversity, primarily the possibilities opened-up by genetic engineering, in particular genetically modified seeds. As a result, international legal frameworks for the management of biological resources—in particular the Convention on Biological Diversity—have had to increasingly take into account not only the needs of biodiversity conservation but also concerns about its potential for economic use and its contribution to the process of economic development.

This has important repercussions from a legal perspective because the new products developed by the biotechnology industry can often easily be copied once they have been put on the market. As a result, the biotechnology industry has strongly argued for the introduction of intellectual property rights over genetically modified organisms, seeds and animals. These calls were heeded at the international level in the context of the negotiations for an Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS agreement) as part of the Uruguay Round of trade negotiations. The resulting TRIPS agreement is an intellectual property rights framework that has directly little to do with environmental management but has significant impacts on the ways in which developing countries such as India can devise legal frameworks to manage their biological resources.

This article seeks to analyze the impacts of the international legal framework for the promotion of intellectual property rights on India's legal regime concerning the control over biological resources and inventions derived from biological resources. It focuses in particular on three acts and legislative amendments adopted in the past couple of years and their organic relationship within the overall domestic legal framework. The article analyses these enactments in the context of the move towards the control of biological resources and derived

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products through property rights. This has impacts not only for control over biological resources and derived products but also more generally on the management of agriculture in India and other developing countries and the realization of food security and the human right to food at the individual level.

We begin by laying-out the international legal framework within which the development of the legal framework for biodiversity management is taking place. The second section analyses the three main acts and amendments adopted in recent years in response to India's ratification of international treaties and the impacts of these acts on biodiversity management at the national and local level. The third section focuses on the issue of control over biological resources and derived products and seeks to provide a broader analysis of the changing international legal framework and its impacts on national law and policy-making concerning the management of biological resources.

International Legal Framework for the Management of Biological Resources

Before turning to the legislative instruments used by India in implementing its international commitments in the field of biological resources, it is necessary to highlight first the main international legal instruments relevant in this field. The biodiversity convention is in theory the main treaty dealing with the conservation and management of biodiversity. Its three main goals are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits derived from the use of genetic resources. The convention reaffirms the principle of state sovereignty, which grants states sovereign rights to exploit their resources pursuant to their own environmental policies together with the responsibility to ensure that activities within their own jurisdiction or control do not cause damage to the environment of other states. It provides a number of general obligations for its member states. These include a commitment to develop national strategies, plans or programs for the conservation and sustainable use of biological diversity. Member states must also integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programs and policies.

The biodiversity convention also provides a general legal framework regulating access to biological resources and the sharing of benefits arising from their use. It attempts to provide a framework that respects donor countries' sovereign rights over their biological and genetic resources while facilitating access to those resources for users. It therefore requires member states to provide access on "mutually agreed terms" and is subject to the "prior informed consent" of the country of origin of those resources.¹ Further, the biodiversity convention provides that donor countries of microorganisms, plants or animals used com-

1. Article 15, Biodiversity Convention 1992.

mercially have the right to obtain a fair share of the benefits derived from such use. Benefit-sharing as conceived under the convention and the related “Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization” can take the form of monetary benefits or non-monetary benefits such as sharing the results of research and development; collaboration, cooperation and contribution in scientific research and development programs, participation in product development; and access to scientific information relevant to the conservation and sustainable use of biological diversity.² With regard, to biodiversity related knowledge, the convention acknowledges the relevance of intellectual property rights but requires member states to ensure that intellectual property rights support the convention’s objectives.³ Overall, the biodiversity convention is particularly significant in the context of this article for two main reasons. Firstly, it recognizes developing countries’ claims to sovereign rights over their biological resources. Secondly, it contributes to the development of a new approach to biological resource management, which puts an increasing emphasis on the potential economic uses of biological resources.

Several other international legal instruments address issues broadly related to biodiversity management. The non-binding International Undertaking on Plant Genetic Resources adopted by the FAO in 1983 was significant because it provided that plant genetic resources were a “common heritage” of humankind. As a result, all countries were called upon to share their genetic resources with the rest of the world and in return were granted the possibility to have free access to resources from other parts of the world. The International Undertaking’s rejection of intellectual property rights claims over plant genetic resources and the fast development of genetic engineering led to a progressive shift in perspective. Member states first determined that the principle of common heritage did not preclude the recognition of plant breeders’ rights and farmers’ rights. They subsequently decided after the adoption of the biodiversity convention to renegotiate the International Undertaking. The result of these negotiations is the new International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA Treaty). The PGRFA treaty is concerned with the promotion of sustainable agriculture and food security. Its importance in the context of biological resource management stems not only from the fact that agricultural management is an important component of overall biodiversity management but also because it specifically echoes the goals of the biodiversity convention. Further, it is the only existing treaty to address the question of farmers’ rights even though it does not provide an internationally agreed definition of the concept. In fact, the PGRFA treaty limits itself to recognizing farmers’ contributions to conserving and enhancing plant genetic resources for food and agriculture. It

2. Bonn Guidelines 2002.

3. Article 16, Biodiversity Convention 1992.

provides broad guidelines to states concerning the scope of the rights to be protected, including the protection of traditional knowledge, farmers' entitlement to participation in benefit-sharing arrangements as well as in decision-making regarding the management of plant genetic resources. The responsibility for realizing these rights, however, is devolved upon member states. Further, the PGRFA treaty is silent with regard to the rights of farmers over their landraces. In fact, the "recognition" of farmers' contribution to plant genetic resource conservation and enhancement does not extend to any form of property rights. The only rights that are recognized are the residual rights to save, use, exchange and sell farm-saved seeds. The overall significance of the PGRFA treaty lies in the fact that it is the first treaty providing a legal framework which not only recognizes the need for conservation and sustainable use of plant genetic resources for food and agriculture but also delineates a regime for access and benefit sharing, and in this process provides direct and indirect links to intellectual property rights instruments. While it has not yet directly influenced legislative processes in India, its importance lies in its significance to the field of agro-biodiversity management and in the fact that it has already been ratified by India.

Besides the PGRFA treaty, which addresses the issue of farmers' rights, the International Convention for the Protection of New Varieties of Plants (UPOV convention) is significant because it provides a legal mechanism for the protection of plant varieties developed by commercial plant breeders through the introduction of "plant breeders' rights." Plant breeders' rights are a hybrid form of intellectual property rights, which give the seed industry similar incentives to those offered by patents, without establishing a complete monopoly. As first conceived in the 1960s, plant breeders' rights included a breeder's and a farmer's exemption that allowed other commercial breeders to conduct research on the protected variety and farmers to use the product of the harvest obtained from a protected variety. Over time, the UPOV convention was revised several times. These revisions tended to strengthen the protection offered to plant breeders while simultaneously restricting the scope of the exceptions allowed. From the point of view of biodiversity management, the UPOV convention established a legal protection regime that seeks to influence the management of agricultural biodiversity. It was therefore an important instrument concerning the management of biological resources. The convention, however, does not acknowledge links between the intellectual property rights regime it sets up, and environmental management.

The above-mentioned treaties constitute the necessary background to understand the role played by the TRIPS agreement in shaping domestic policies for biodiversity management. The agreement, concluded as part of the WTO extends standards of intellectual property rights protection of OECD countries to other WTO member states. It covers different fields of intellectual property among which patent rights are the most important from the perspective of the management of biological resources. Patents are statutory rights that provide the inventor of a product or process that is new, that includes an inventive ele-

ment and that is capable of industrial application, near monopoly rights for twenty years.⁴ The TRIPS agreement establishes the principle that patents should be available in all fields of technology. Some general exceptions to patentability are permitted in particular to protect human health or the environment but all member states must, for instance, extend patentability to microorganisms. They must also offer legal protection for plant varieties either through patents or through an alternative property rights system (*sui generis*).⁵ Overall, the TRIPS agreement marks a radical shift from previous intellectual property rights treaties in requiring that member states provide legal protection to inventions based on biological resources.⁶ While the TRIPS agreement has a direct impact on biological resource management, the objectives of the treaty contain no injunction that the introduction of patents in biodiversity related fields must contribute to sustainable development. In this context, the only indirect reference to the necessity to promote sustainability is the reference in the preamble to the instrument establishing the WTO.⁷

The International Legal Regime for Biological Resource Management and its Implementation in India

Environmental law in India has developed rapidly over the last thirty years, influenced in part by international treaties and standards but driven largely by domestic pressures and concerns. The last ten years have, however, seen increasing international influence in this area. Part of the explanation for this increase lies in the number of treaties that India has ratified. Since the early 1990s, however, India has been significantly influenced by the neo-liberal consensus advocated by the Bretton Woods institutions. This involves the discrediting of the state and state intervention, increasing pressures to open-up the economy, the emphasis on private property and entrepreneurship as the engines of progress and the liberalization of state institutions in order that India may better integrate with a globalized world economy.⁸ This neo-liberal consensus has played a significant role in opening-up state institutions, including the legislature, to international influence. The TRIPS agreement is a part of the multilateral trading regime integral to these changes and its significance is enhanced by reliance on the WTO dispute settlement mechanism to ensure implementation by all member states. The agreement has therefore played an important part in bringing about TRIPS-compliant legislation and more generally contributed to an increasing emphasis on the appropriation of resources and knowledge through property rights.

4. Article 27 (1), TRIPS Agreement 1994.

5. Article 27 (3), TRIPS Agreement 1994. This formulation was chosen because negotiating states could not agree on a more precise formula. This gives member states some latitude in deciding the form of the protection regime they want to implement for plant varieties.

6. Eisenberg 1987.

7. Agreement Establishing the World Trade Organization 1994.

8. Drahos 1996.

A number of specific requirements of the TRIPS agreement have an impact on the regime for the management of biological resources in India. Most significant is the widening of the scope of patentability, which imposes for instance the introduction of patent protection to new areas such as health and agriculture, and the requirement for intellectual property protection for plant varieties. This required amendments to the 1970 Patents Act that had restricted patentability and the rights conferred in the areas of health and agriculture and had explicitly disallowed the patentability of living organisms. This act had been adopted after many years of debate and had drawn a fine balance. It upheld the patent regime inherited from the colonial period while subordinating it to larger social concerns, such as food security and access to affordable drugs. The amendments required by the TRIPS agreement therefore had to be carried out in the face of sustained opposition. The first bill introduced in parliament in 1994 for the amendment of the act was rejected. Following India's failure to comply with the obligations it had to implement in 1995, and subsequent complaints by the United States and the European Union, panels of the Dispute Settlement Body of the WTO declared that India was in violation of TRIPS. Two different TRIPS-compliant amendments were finally enacted in 1999 and 2002. Separate legislation for the protection of plant varieties was introduced in parliament in 1999 to meet the 1 January 2000 deadline set by TRIPS, but finally adopted only in 2001.

Finally, the Biodiversity Act was adopted ostensibly to give effect to India's commitments under the biodiversity convention. However, the processes leading to the enactment of the other two pieces of legislation defined the context in which the biodiversity act came to be adopted. Added to this were instances of assertion of intellectual property claims over knowledge in the public domain in India in foreign jurisdictions ("biopiracy").

The acts read together therefore provide a picture of a state under international pressure institutionally—through states and multilateral institutions—to accord greater protection to claims of private intellectual property. As importantly, the legislation reflects concerns over biopiracy. The government response through these three acts is to recognize private property rights and simultaneously to give itself the power to determine the limits of those rights within the limits of its sovereign jurisdiction.

The Biological Diversity Act

The Biological Diversity Act was adopted following India's ratification of the biodiversity convention. The act has, however, also been informed by developments in other contexts such as the adoption of the TRIPS agreement. In fact, the act does not provide a comprehensive regime for the conservation and sustainable use of biological resources but focuses on the question of access to resources and related issues. Its response to the current challenges is to rely on the time-tested principle of permanent sovereignty over natural resources. It pro-

poses to put stringent limits on access to biological resources or related knowledge for all foreigners. Under the act, all foreigners are treated in the same way, regardless of whether there are from developed countries or from least developed countries. Furthermore, the strong provisions to regulate access by foreigners are not matched at the national level where local knowledge holders are not given strong control over their resources and knowledge.

More specifically, the act's aim is to provide for the "conservation of biological diversity, sustainable use of its components and for the equitable sharing of the benefits arising out of the use of biological resources."⁹ It institutes a National Biodiversity Authority at the federal level and State Biodiversity Authorities at the provincial level, as nodal bodies to oversee the conservation, use and sharing of the benefits from the use of biological resources. It makes prior intimation of the intention to obtain biological resources for commercial utilization or bio-survey or bio-utilization, to these boards mandatory.¹⁰ It further requires that all inventors obtain the consent of the National Biodiversity Authority before applying for intellectual property rights where the invention is based on any biological resource obtained from India, and grants the authority the power to "impose benefit sharing fee or royalty or both or impose conditions including the sharing of financial benefits arising out of the commercial utilization of such rights."¹¹ Given the lack of extraterritorial jurisdiction of the National Biodiversity Authority and its inability to monitor applications overseas though, the efficacy of such a provision will remain in doubt.

The act condones the introduction of intellectual property rights in the management of biological resources provided for in the TRIPS agreement but does not directly address the subordination of intellectual property rights to the goals of the biodiversity convention as mandated by article 16 of that convention. It attempts to impose checks on the intellectual property rights system in some other respects by authorizing the authority to allocate a monopoly right to more than one actor and in giving to the authority the power to oppose the grant of intellectual property rights outside India.¹² It also seeks to address the question of the rights of holders of local knowledge by setting up a system of benefit-sharing. The benefit-sharing scheme is innovative in that it provides that the authority can decide to grant joint ownership of a monopoly intellectual property right to the inventor and the authority or the actual contributors if they can be identified. The act also provides other forms of benefit sharing which are progressive insofar as they prioritize non-financial benefits such as transfer of technology, which are more long-lasting than financial compensation.¹³

The act does not, however, give current rights-holders the capacity to defend their rights in the same way that it seeks to equip the Indian state with

9. Preamble, Biological Diversity Act, 2002.

10. Section 7, Biological Diversity Act, 2002.

11. Section 6, Biological Diversity Act, 2002.

12. Section 18(4), Biological Diversity Act, 2002.

13. Section 21, Biological Diversity Act, 2002.

tools to ward-off biopiracy or even with rights equivalent to that provided patent holders or applicants. In cases where benefit-sharing is allocated in the form of money, the authority can direct the payment to a Biodiversity Fund, and the proceeds from this fund can then either be channeled to the benefit claimers or used generally for biodiversity management activities. The potential claimants do not have automatic access to a share of the benefits. Even where property rights are allocated instead of money, local innovators do not have a right to the allocation but are dependent on the authority's decision in contradistinction with applicants for patent rights who need the authority's approval but cannot be stopped from applying for the right. Further, the act is conspicuously shy in its treatment of traditional and local knowledge, merely requiring the central government to "endeavor to respect and protect" such knowledge,¹⁴ whereas the question, especially in the Indian context is important enough to not be left to the discretion of the executive and to require a definitive statement of law.

Overall, one of the striking features of the regime is that it completely obliterates common property arrangements whose importance and extent in the context of the management of biological resources is still immense.¹⁵ The act centralizes property rights either in the hands of the state through sovereign appropriation or in the hands of private inventors through monopoly intellectual property rights. It does not, however, provide a framework for the rights of all other holders of biological resources and related knowledge. The consequence is that resources and knowledge that are not allocated to private entities through intellectual property rights or arrogated by the state to itself, will be deemed freely available.

The Plant Variety Act

The Protection of Plant Varieties and Farmers' Rights Act, 2001 (Plant Variety Act) was drafted in response to a specific provision requiring the introduction of plant variety protection, article 27 (3)(b) of the TRIPS agreement. Given its significance and the controversies it had generated even before being introduced in parliament, the act was referred to a parliamentary committee after its introduction in December 1999. This committee conducted hearings over the first months of 2000 and finalized its report in August 2000 along with a substantially revised Plant Variety Bill, which was passed by parliament in August 2001.¹⁶

The act sets out "to recognize and protect the rights of the farmers in respect of their contribution made at any time in conserving, improving and making available plant genetic resources for the development of new plant varieties" as well as "to protect plant breeders' rights to stimulate investment for research and development, both in the public and private sector, for the development of

14. Section 36(5), Biological Diversity Act, 2002.

15. Jodha 1995.

16. Report of the Joint Committee 2000 and Plant Variety Act, 2001.

new plant varieties.”¹⁷ It largely follows the model provided by the UPOV convention incorporating elements from the 1978 version of UPOV. It also includes some elements of the more stringent 1991 version.

The section on farmers’ rights was substantially reworked by the parliamentary committee adding a whole new chapter to what was a single provision, in making an effort to put farmers’ rights on a par with breeders’ rights. The act provides, for instance, that farmers are entitled, like commercial breeders, to apply to have a variety registered and that farmers should generally be treated like commercial breeders and should receive the same kind of protection for the varieties they develop.¹⁸ However, given the fact that the act adopts the registration criteria of the UPOV convention namely novelty, distinctiveness, uniformity and stability, which cannot be easily applied for the registration of farmers’ varieties, it is unclear how effective the protection provided to farmers’ contribution will be.

Apart from giving rights to farmers over new varieties, the act recalls the residual minimum rights that cannot be taken away from farmers. Further, through the mechanism of “benefit-sharing,” the act seeks to foster the participation of farmers in some of the potential profits from the commercialization of registered plant varieties. The act provides two different channels for claiming compensation, sections 26 and 41. In both cases, it is significant that the Protection of Plant Varieties and Farmers’ Rights Authority instituted under the act is vested with significant discretion in disposing of the benefit-sharing claims. At a conceptual level, the benefit sharing regimes envisaged by the act are an admission of the inability to provide property rights to protect the contributions of farmers in the same manner that property rights operate in the interests of plant breeders. Furthermore, even where the act envisages financial compensation, by placing the burden of proof on the claimants they are left finally significantly dependent on the authority’s discretion.

While overall, the section on farmers’ rights is relatively progressive, a further rethink of the conceptual framework of the act would be required to provide farmers’ rights with more meaning. This is first because farmers’ rights were only added as an afterthought to a regime based on the UPOV convention that is specifically addressed to the interests of plant breeders and not farmers. Second, benefit-sharing as envisaged under the current act does not contribute to strengthening the rights of farmers but merely offers financial compensation for actors not in a position to apply for property rights.

The Patents (Amendment) Act of 2002

The ratification of the TRIPS agreement meant that significant changes had to be brought to India’s Patents Act of 1970. The TRIPS agreement does not give coun-

17. Preamble, Plant Variety Act, 2001.

18. Section 16 (1) d, Plant Variety Act, 2001.

tries much leeway in adapting their patent laws. The few openings that are provided, for instance, in article 27(2) have been used in the Patents Amendment Act. In particular, the environmental and health exceptions are drafted into section 3, which defines what is not considered an invention under the act. Thus, the act now specifically rules out the patentability of living things or non-living substances occurring in nature and further rejects the patentability of plants and animals. Further, the act not only retains the exception concerning product patents for food and drugs but also now specifies that it excludes biochemical, biotechnological and microbiological processes.¹⁹ In reaction to concerns over biopiracy and the unwarranted use of traditional knowledge, the act first proposes to impose the disclosure of the source and geographical origin of biological material used in an invention. Further, it makes the non-disclosure of the geographical origin of biological material used in the invention or the anticipation of the invention in local or indigenous knowledge a ground for opposing or revoking the patent.²⁰

Property Rights and Biological Resources in India in the TRIPS Era

The impact of the domestic legal regime on property rights must be understood in the context of the rapid changes observed at the international level over the past decades. At the international law level, the distribution of property rights over biological resources has been a long-standing concern. One of the cardinal principles of international law since decolonization has been the permanent sovereignty of states over their natural resources.²¹ Over time, even though the principle has been frequently reiterated, exceptions have developed. Thus, the conservation and management of biological and genetic resources are now a “common concern of humankind” which implies at least a loose “right of regard” by the international community into states’ policies in this regard (see also Sand, this issue).²²

Recent developments in India are interesting because India is one of the few countries with significant biological resources, the potential to develop an own biotechnology industry and strong local knowledge bases concerning the use of its biological resources. India is also one of the few countries that, while not rejecting the western patent model, decided as an independent country to tailor the system to make sure that it would fulfill a number of socioeconomic goals in keeping with the overwhelming need to put the tackling of poverty before legal mechanisms providing protection to individual inventors.

The legal status of plant genetic resources constitutes an interesting case study. In general, the call for the establishment of the principle of permanent sovereignty over natural resources first came from newly decolonized coun-

19. Section 5, Patents Act, 1970 (as amended 2002).

20. Section 25, Patents Act, 1970 (as amended 2002).

21. United Nations General Assembly Resolution 1803.

22. Preamble, Biodiversity Convention 1992, and Preamble, PGRA Treaty 2001.

tries.²³ However, with regard to plant genetic resources developing countries argued in favor of the concept of "common heritage of humankind" which implies that no sovereign rights can be imposed. This was opposed by some developed countries but the international community adopted the International Undertaking, which recognized plant genetic resources as a common heritage of humankind. The rationale was that states should collaborate in the management of plant genetic resources because improved flows of germ-plasm and related knowledge between countries would contribute to the broader goal of enhancing food security in developing countries.

In fact, the International Undertaking reflected the existing international system for agricultural management. India had, like many other developing countries, substantially benefited from the principle of free sharing of knowledge and resources. Green Revolution varieties, which contributed to significant yield improvements in some regions of India for a number of years, were the product of international collaborative research and the result of the exchange of crop varieties across countries and regions of the world. This international collaborative system was formalized in the early 1970 with the setting up of the Consultative Group for International Agricultural Research (CGIAR), a coordinating institutional structure for a series of international agricultural research centers spread around the world.

Since the adoption of the International Undertaking in 1983, significant changes have occurred in the field of plant genetic resource management. This can be clearly identified in the case of the PGRFA treaty, which has been adopted to replace the International Undertaking. The treaty, instead of relying on the notion of common heritage of humankind, affirms states' sovereign rights over their PGRFA. This presupposes a complete change of perspective on the management of plant genetic resources. Instead of a system based on the free exchange of biological and genetic resources and improved products, such as high-yielding crop varieties, the PGRFA treaty provides a framework wherein states are meant to assert control over resources. The most significant complementary feature is that the new regime also recognizes and promotes appropriation of genetic resources and related knowledge through intellectual property rights. The PGRFA treaty does not specifically focus on existing intellectual property rights such as patents and plant breeders' rights, but provides a framework for the recognition of farmers' rights. The treaty gives broad guidelines to states concerning the scope of the rights to be protected and devolves the responsibility for realizing farmers' rights to member states. This includes the protection of traditional knowledge, farmers' entitlement to a part of benefit-sharing arrangements and the right to participate in decision-making regarding the management of plant genetic resources. While the treaty neither defines farmers' rights at the international level nor recognizes farmers' rights as equivalent rights to plant breeders' rights, it generally promotes appropriation of

23. Schrijver 1997.

genetic resources and related knowledge through sovereign and private appropriation.

The position taken by the PGRFA treaty is already reflected in the practice of the CGIAR centers. While the centers still attempt to uphold the principle of free flows of knowledge and resources on which their work has been based since the inception of the CGIAR,²⁴ they have been under increasing pressure to accept the appropriation of knowledge through intellectual property rights.²⁵

In India, the three legislative instruments make up as a whole the new legal regime for the use of biological resources and related knowledge. By collectively increasing the attractiveness of the economic exploitation of biological resources and related knowledge, they have resulted in two main consequences. One is their significant influence on conservation policies in India. This is important because while the Biodiversity Act adopts the twin goals of conservation and sustainable use, neither the Patents Act nor the Plant Variety Act are concerned with biodiversity conservation. This makes the striking of a balance between economic use and conservation difficult to achieve without specific coordination between the acts at the implementation level. The second main consequence of the approach adopted by the three instruments is in the field of property rights. The combined impact of the three enactments is an implicit (re)distribution of property rights. This has been controversial because of the socioeconomic implications and the need to find new ways to articulate private property rights and sovereign rights in the field of biological resources.

The Biodiversity Act clearly reflects the trends of the international level. It seeks at the same time to promote sovereign and private appropriation of biological resources and related knowledge. Among the consequences that this will have from the perspective of international collaboration on agricultural research is that India as a country will be less willing to share its resources freely with the CGIAR Centers. Since most countries are likely to adopt the same attitude, this will result in diminishing supplies of germplasm to international seed banks. This will be damaging to countries like India that have in the past significantly benefited from the international collaborative system. In fact, this is likely to go against the interests of most developing countries since most of them, including India, are highly dependent on genetic resources from other regions for their main staples.²⁶ In turn, the Biodiversity Act seeks to promote private appropriation through intellectual property rights. This has the potential to be beneficial to all entities or individuals around the world who make any new biodiversity-based product that fulfils the criteria for protection through intellectual property rights. However, there is no guarantee that this arrangement will be of most benefit to Indian individuals or entities despite the potential for the development of a domestic agro-biotechnology industry.

24. This is for instance illustrated by the agreements signed by the centers with the FAO concerning their germplasm collections. See, for example, Agreement between the IPGRI/INIBAP.

25. Consultative Group on International Agricultural Research 1999.

26. Palacios 1997.

The rapid adoption of diverse systems of property rights to foster appropriation of biological resources and related knowledge has significant consequences for individuals or entities that cannot benefit from the new system in place. Two main examples illustrate this trend. Firstly, one of the characteristics of patents is to provide near monopoly rights that allocate all the benefits of a given invention to one entity or individual. In the case of agro-biotechnology, it is often the case that the final product, which can be protected by a patent such as a transgenic seed, is the product of diverse types of research and knowledge by different people in different places and at different times. One of the most frequent examples is the case where the local knowledge of a farmer or local community is used as a basis by researchers in the formal sector to develop a new transgenic product. Since the local variety cannot be protected through intellectual property rights because it does not fulfill the necessary requirements, no protection is offered by the legal system, which does not offer any alternative forms of protection at present.²⁷ In the current scenario, the only thing that is offered to individuals or groups who have contributed to the development of a product protected by intellectual property rights, is "benefit-sharing." Benefit-sharing as proposed in the acts analyzed above constitutes a form of compensation for the absence of property rights. In other words, a local farmer can, for instance, be granted a sum of money as compensation for his/her contribution to a patented invention but s/he cannot claim property rights over knowledge. In a historical perspective what has happened over the past two decades is that agricultural management has rapidly moved from a system where no one could claim any intellectual property rights in agriculture to a system where some can claim very effective rights (a commercial seed company for instance) and some do not get any property rights (traditional knowledge holders for instance).

Secondly, problems related to the development of the new property rights system also take the form of biopiracy across countries. This is partly linked to the different systems through which countries judge "novelty" in the patents system and partly linked to the different levels of intellectual property rights protection in different countries. In the case of the former, the kinds of problems that can surface are well illustrated by a patent taken in the United States on some supposedly new healing properties of turmeric.²⁸ The patent was granted for properties that were well known in India but the US patent system does not specifically force patent examiners to take into account knowledge from other countries.²⁹ As a result, the Indian government had to contest the patent in the United States to have it revoked. The latter case is illustrated by a number of patents taken in the United States or in Europe on agricultural

27. Efforts are however being made to propose the development of a legal framework for the protection of traditional knowledge. See, e.g., Biological Resources and Traditional Knowledge (Protection and Regulation) Bill 2003 (on file with the authors).

28. US Patent No. 5,401,504,

29. Title 35 United States Code, Section 102.

processes that were not patentable in India.³⁰ Biopiracy is problematic for a number of reasons. While the worst cases—such as the turmeric patent where the patent should not be granted in any jurisdiction because the conditions for patentability are not fulfilled—can be eliminated by improving access to traditional knowledge, developing countries will find it difficult to stop the appropriation of their knowledge in other countries as a whole. This is because the TRIPS agreement only imposes minimum levels of intellectual property rights protection. Member states can go further than the minimum levels. As a result, inventions that may not be patentable in India may be patentable in the United States or Europe. Since patents are territorial rights, the only thing that a country like India can do is to restrict patentability to the extent possible under TRIPS in its own jurisdiction. This still makes it possible for knowledge to be patentable in other jurisdictions.

The appropriation of biological resources and related knowledge in India must also be seen in the context of the historical debate that led to the adoption of the Patents Act, 1970 and the socioeconomic concerns that were introduced at that point. The Patents Act specifically sought to accept patents as a useful tool to reward inventiveness while recognizing that the system had to be carefully bounded to avoid undesirable social outcomes. This led to the adoption of provisions to ensure that patents rights would not be used in a manner detrimental to the public at large.³¹ The act imposed, for instance, restrictions meant to avoid the over-commercialization of sectors that were of vital importance for meeting basic needs, such as food and health. It prohibited the patentability of all methods of agriculture and horticulture or processes for the medicinal, surgical or other treatment of human beings.³² The act also limited the term of process patents for substances intended for use as food, medicine or drug, the term was seven years while the normal term of the patent was fourteen years. Further restrictions were imposed on the rights of the patent holder including stringent provisions for compulsory licensing and for licenses of right.³³

The new regime adopted is surprising not only because it dismantles the restrictions put in place for socioeconomic reasons but also because it does not seem to provide an integrated response to existing challenges. The most significant element is probably the fact that the question of the relationship between the patent system and sustainable biodiversity management has been addressed neither in the Biodiversity Act nor in the Patents Amendment Act. This includes, for instance, issues concerning the possibility offered to the National Biodiversity Authority to impose the sharing of intellectual property rights as a form of benefit sharing, something which is not provided for in the Patents Act.³⁴ This is only partly surprising since the same problem exists at the interna-

30. For instance, US Patent No. 5,827,521 and US Patent No. 5,695,763.

31. Dhavan and Prabhu 1995.

32. Section 3 h, Patents Act, 1970.

33. Chapter XVI, Patents Act, 1970.

34. Section 6, Biological Diversity Act, 2002.

tional level between the biodiversity convention and the TRIPS agreement³⁵ and since the act and the Amendments were drafted separately in two different ministries.

Recent developments tend to indicate that a number of problems should be addressed at both the national and international levels. The nature of the current property rights regime that on the surface puts power in the hands of state by reaffirming sovereign rights over biological resources but in effect removes more power from their control by insisting on the increasing scope of private property rights must be addressed concurrently at the national and international levels. While for developed countries, the solution may lie in ever-stronger patent rights, this cannot constitute a solution for countries like India, which need to take into account basic needs such as food while devising policies on biodiversity management. In fact, one of the most important tasks facing developing countries in years to come will be to “diversify” the property rights regime in the field of biological resource management. This implies that they should take steps to ensure that the rights of holders of knowledge, which are not easily protected under the existing legal regime such as traditional knowledge, are provided specific protection under national law. This constitutes one of the few avenues opened to India in the current environment to strengthen the legal framework in this area in favor of the majority of its citizens.

It will also be necessary to address issues concerning the relationship between property rights and human rights, including the questions of restrictions on the patentability of life forms that should be imposed, as well as more specific concerns about the impacts of the introduction of patents in biological resource management on the realization of the human right to food, right to health and the right to a clean environment.

Conclusion

The influence of the TRIPS agreement over recent legislative activity is a fact that assumes more significance because its impacts go beyond the strict field of intellectual property. This is visible insofar as some of the changes imposed by TRIPS directly impact on environmental management and environmental laws while at the same time fostering a property rights regime that has the potential to have negative impacts on the management of biological resources. Importantly, this has largely been a one-way route. Environmental law and environmental concerns, domestic or international, in spite of their considerable stake in the shape of intellectual property rights regimes have had little impact on the development of the intellectual property rights regime.

India’s reaction to TRIPS must be understood in this larger context. The government’s initial resistance to the inclusion of intellectual property in the

35. World Trade Organization 2000.

context of trade negotiations during the Uruguay Round gradually dissipated until it finally changed its mind. Though the first set of changes required by TRIPS was rejected in parliament, there has been a progressive softening of the opposition at a political level. Importantly, the current government headed by the Bharatiya Janata Party (BJP) has been consistently in favor of WTO since coming to power. This U-turn from an earlier position where the party defined itself in terms of its opposition to external influences is substantially qualified by its continuing claims to represent indigenous interests as evidenced in its claims in favor of locally based indigenous development. The tension between these two irreconcilable objectives can partially account for the responses offered to the global intellectual property rights regime. In effect, the new legislative framework attempts to not upset the global legal order while simultaneously refusing to surrender the domestically significant currency of national interest. At the level of the legal regime, this has translated into a greater concentration of powers in the hands of the government at the national level accompanied by a surrendering of certain avenues to private sector interests.

Finally, it is significant that the shape of the legal framework reflects the extent of people's participation in the legislative process. The TRIPS agreement was widely criticized even before its adoption but widespread consultations within the country were never held before ratification. This missing participation was first reflected in parliament's rejection of the first proposed amendment to the Patents Act only half a year after the government had ratified the TRIPS agreement and committed the country to its implementation. Since then, some of the lessons of the lack of participation have been learnt, though in a yet unsatisfactory fashion. The Plant Variety Bill introduced in 1999 in parliament did not benefit from widespread participation by relevant actors but was significantly modified after a parliamentary committee conducted its own survey and decided the draft was not appropriate. In the context of the Biodiversity Act, a major consultative process has been taking place in the context of the development of a National Biodiversity Strategy and Action Plan but it has not had a direct impact on the act, which was drafted and adopted much before the completion of the strategy and action plan.

The interactions between intellectual property rights regimes and biodiversity management remain an evolving and unsettled issue at the international level. This notwithstanding individual countries like India must put in place legal frameworks for the management of biodiversity that make a coherent whole. While the existing national regime is insufficiently concerned with the overall coherence of the system put in place, it can be hoped that these shortcomings will be addressed at the level of implementation.

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