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PROPERTY RIGHTS OVER BIOLOGICAL RESOURCES INDIA'S PROPOSED LEGISLATIVE FRAMEWORK

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Property Rights over Biological Resources

India's Proposed Legislative Framework

Philippe CULLET*

INTRODUCTION

The allocation of property rights over biological resources and biodiversity-related knowledge has been at the centre of significant debates in the context of the Convention on Biological Diversity (Biodiversity Convention)¹ and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement).² This process of (re)distribution has been extremely sensitive because it has significant socio-economic implications and contributes to changing perceptions of State sovereignty. In this context, it is interesting to examine how the various relevant instruments are being implemented in specific countries. India constitutes a particularly interesting case study. It is richly endowed with biodiversity, has a long tradition of indigenous agricultural and pharmaceutical development and had a patent regime which differed markedly from its Western counterparts. At present, India is in the process of implementing its obligations under the Biodiversity Convention and the TRIPS Agreement and the Indian Parliament is currently considering three related bills to this end. This article briefly outlines the international law framework concerning property rights over biological resources and associated knowledge. The second part analyses the three bills currently being considered by the Indian Parliament with a focus on the intellectual property component, while the last part critically examines the property rights implications of the legal regime proposed for adoption.

I. BIOLOGICAL RESOURCES AND PROPERTY RIGHTS

The distribution of property rights over biological resources has been a long-standing concern in international law. Indeed, one of the cardinal principles of international law since decolonisation has been the permanent sovereignty of States over

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¹ Convention on Biological Diversity, Rio de Janeiro, 5 June 1992, reprinted in 31 Int'l Legal Mat. 818, 1992.

² Agreement on Trade-Related Aspects of Intellectual Property Rights, in *General Agreement on Tariffs and Trade: Multilateral Trade Negotiations Final Act Embodying the Results of the Uruguay Round of Trade Negotiations, Annex 1C, Marrakesh, 15 April 1994*, reprinted in 33 Int'l Legal Mat. 1125, 1994.

their natural resources.³ The question of sovereignty has remained extremely sensitive and constitutes, for instance, one important factor explaining the lack of an international legal framework governing the management of forests until today.⁴ In recent years, debates over the allocation of biological resources have intensified at the international level. This is first due to concerns related to the conservation of biodiversity linked to the ever-increasing exploitation of biological resources on a global level. Second, scientific advances in the field of genetic engineering have opened significant new economic opportunities. In a context of economic globalization, this has made the issues of access, use and control over biological resources a topic of increasing interest in international forums. In recent years, however, the issue of control over the resources themselves has been superseded by questions concerning biodiversity-related knowledge and inventions. Intellectual property rights concerning biodiversity have thus been in the limelight. The introduction of intellectual property rights has been controversial because nature and nature-related knowledge were, for a long time, excluded from the framework of intellectual property law.⁵

The international legal framework concerning property rights over biological resources and related knowledge reflects to a large extent the debates and power struggles over the allocation of property rights. A number of legal instruments are of direct relevance in this field. The Biodiversity Convention is, in theory, the main treaty dealing with the conservation and management of biodiversity. It provides a general framework for the allocation of property rights but the vagueness of some of its provisions implies that substantive discussions are still being held concerning, for instance, the allocation of property rights over traditional knowledge.⁶ Some provisions of the Biodiversity Convention are of special interest in the context of the present article. In general, the Biodiversity Convention reasserts the traditional principle that States have permanent sovereignty over the resources found in their territories.⁷ With regard to biodiversity-related knowledge, the Convention acknowledges the relevance of intellectual property rights but Member States are required to ensure that intellectual property rights support the Convention's objectives.⁸ The Convention also recognizes that, as part of their efforts to promote *in situ* conservation, Member States should respect traditional knowledge and promote its wider application.⁹

³ See, e.g., General Assembly Resolution 1803 (xvii), *Permanent Sovereignty over Natural Resources*, 14 December 1962, reprinted in 2 Int'l Legal Mat. 223, 1963.

⁴ In 1992, the only instrument that could be adopted at the Rio Conference concerning forests was a Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests, Rio de Janeiro, 14 June 1992, reprinted in 31 Int'l Legal Mat. 881, 1992.

⁵ See, e.g., Rebecca S. Eisenberg, *Proprietary Rights and the Norms of Science in Biotechnology Research*, 97 Yale L.J. 177, 1987.

⁶ See, e.g., Dec. V/16, *Article 8(j) and Related Provisions*, Report of the Fifth Meeting of the Conference of the Parties to the Convention on Biological Diversity, Nairobi, 15–26 May 2000, UN Doc. UNEP/CBD/COP/5/23.

⁷ Biodiversity Convention, *supra*, footnote 1, Article 3.

⁸ *Ibid.*, Article 16.

⁹ *Ibid.*, Article 8(j).

With regard to the protection of intellectual property rights, the main international legal instrument is the TRIPS Agreement. It generally extends standards of intellectual property rights recognized in Organisation for Economic Co-operation and Development (OECD) countries to other World Trade Organization Member States. In so far as patents are concerned, the principle is that patents should be available in all fields of technology.¹⁰ Some general exceptions to patentability are permitted, in particular to protect human health or the environment.¹¹ However, where the patenting of life forms is concerned, TRIPS provides that all Member States must, for instance, accept the patentability of micro-organisms. They must also protect plant varieties either through patents or an alternative property rights system (*sui generis*).¹² India has had to apply the TRIPS Agreement from 1 January 2000, the date by which implementing legislations should have been enacted.

The protection of plant varieties is one of the few areas which has seen the development of a specific international legal framework. The International Convention for the Protection of New Varieties of Plants (UPOV) specifically focuses on the establishment of plant breeders' rights (PBRs).¹³ PBRs were developed as a hybrid form of intellectual property rights which would give the seed industry the same kind of incentives as patents but without offering a complete monopoly right to the holder of the right. In their original acceptance, PBRs included both a breeder's and a farmer's exemption which allowed other commercial breeders to carry on research on the protected variety and farmers to use the product of the harvest obtained from a protected variety. Over time, the Convention has been revised several times, in particular in 1978 and 1991.¹⁴ These revisions have tended to strengthen the protection offered to plant breeders and have, at the same time, restricted the scope of the exceptions granted. UPOV has been proposed as one of the *sui generis* systems that developing countries can adopt to fulfil their obligations under TRIPS.¹⁵

While UPOV focuses exclusively on the protection of plant varieties for commercial breeders, the International Undertaking on Plant Genetic Resources (Undertaking) of the Food and Agriculture Organization (FAO) adopts a broader perspective and considers farmers' rights and commercial breeders' rights to be equal and

¹⁰ TRIPS Agreement, *supra*, footnote 2, Article 27.1.

¹¹ *Ibid.*, Article 27.2; see also below Section III.C.

¹² TRIPS Agreement, *supra*, footnote 2, Article 27.3(b).

¹³ International Convention for the Protection of New Varieties of Plants, Paris, 2 December 1961, 815 UN Treaty Series 89.

¹⁴ For the 1991 version, see International Convention for the Protection of New Varieties of Plants, Paris, 2 December 1961, as Revised at Geneva on 10 November 1972, 23 October 1978 and 19 March 1991, UPOV, Geneva, UPOV Doc. 221(E), 1996.

¹⁵ See, e.g., Geoff Tansey, *Trade, Intellectual Property, Food and Biodiversity*, Quaker Peace & Service, London, 1999.

complementary rights.¹⁶ In the revised Undertaking currently under discussion, farmers' rights include the protection of farmers' traditional knowledge, their right to a share of the benefits arising from the utilization of genetic resources tended by them and the right to participate in taking decisions concerning the conservation and use of plant genetic resources in agriculture.¹⁷

The rather intricate nature of the legal regime governing property rights over biodiversity resources and related knowledge is further complicated by the fact that a number of issues are still under discussion in different forums. Thus, a property rights regime for traditional knowledge at the international level is still in its infancy.¹⁸ Apart from discussions at the international level, a number of people and institutions have made proposals concerning property rights systems. To take only the case of India, there have, for instance, been suggestions for registration of existing biological resources and knowledge,¹⁹ and patents on traditional knowledge.²⁰

The current legal regime, which is dominated to a large extent by the TRIPS Agreement, gives States relatively little flexibility to devise domestic property rights systems adapted to their own conditions. Plant variety protection provides a significant exception within the TRIPS context. In this case, countries get a chance to devise a property rights regime for plant varieties which fits within the broader regimes being developed in most countries for access to and control over biological resources and related knowledge. There are, however, significant difficulties in adopting regimes which fulfil all international obligations and at the same time preserve national interests. India's proposed legal framework in the area of plant variety protection and biodiversity perfectly illustrates these tensions and difficulties.

II. PROPOSED LEGISLATIVE FRAMEWORK IN INDIA

India is a party to the TRIPS Agreement and the Biodiversity Convention and is in the process of implementing its obligations concerning these two Agreements. Three bills have been introduced in Parliament to implement some of India's international obligations related to these treaties.²¹ These are the Biodiversity Bill,²² the Patents

¹⁶ See *International Undertaking on Plant Genetic Resources*, Res. 8/83, *Report of the Conference of FAO, 22nd Session*, Rome, 5–23 November 1983, Doc. C83/REP; and *Agreed Interpretation of the International Undertaking*, 1989, Res. 4/89, *Report of the Conference of the FAO, 25th Session*, Rome, 11–29 November 1989, Doc. C89/REP.

¹⁷ See, e.g., *Composite Draft Text of the International Undertaking on Plant Genetic Resources* (Draft International Undertaking), Commission on Genetic Resources for Food and Agriculture, Fifth Inter-Sessional Meeting of the Contact Group, Doc. CGRFA/CG-5/01/2, 2000.

¹⁸ See, e.g., Dec. V/16, *supra*, footnote 6.

¹⁹ See, e.g., G. Utkarsh *et al.*, *Intellectual Property Rights on Biological Resources: Benefiting from Biodiversity and People's Knowledge*, 77 *Current Science* 1418, 1999.

²⁰ See, e.g., Biodiversity (Rights and Protection) Bill, proposed by the Research Foundation for Science, Technology and Ecology & Lawyers Collective, on file with the author, 1998.

²¹ Some of its TRIPS obligations relating, for instance, to copyright or geographical indications have already been passed by Parliament. See The Copyright Act, 1957 (as amended by the Copyright (Amendment) Act, 1999) and The Geographical Indications of Goods (Registration and Protection) Act, 1999 (Act 48 of 1999).

²² Biological Diversity Bill, 2000, Bill No. 93 of 2000.

Amendment Bill,²³ and the Plant Variety Bill.²⁴ While there is no specific deadline for the implementation of the Biodiversity Convention, the two Bills drafted in response to TRIPS obligations should have been in place by 1 January 2000. The Patents Amendment and Plant Variety Bills were indeed introduced in December 1999 but they were not adopted immediately. Instead, they were referred to joint parliamentary committees for further examination in view of their overall significance. The Joint Committee on the Plant Variety Bill submitted its Report and a substantially revised draft legislation in August 2000 while the Joint Committee on the Patents Amendment Bill should submit a report during the course of 2001. There is, at present, a broad consensus among the main political parties concerning the process of economic reforms which should allow the adoption of these two Bills but the changes proposed by the Plant Variety Committee are indicative of the growing unease with some of the WTO-mandated changes and novelties. The Biodiversity Bill introduced in May 2000 was referred to a parliamentary standing committee which is also expected to finalize its Report in 2001.

A. *The Biodiversity Bill*

The Biodiversity Bill is a direct response to India's ratification of the Biodiversity Convention in 1994. The Biodiversity Convention is the direct catalyst for the Bill but it has also been informed by other factors. The Bill illustrates, for instance, the clear reaction of the government to biopiracy or the illegal appropriation of resources and knowledge to which India has been subjected several times.²⁵ The Bill is also partly informed by the TRIPS Agreement and the desire to avoid a direct confrontation with WTO obligations in this field.

The first general characteristic of the Bill is that it does not provide a comprehensive legal regime for the conservation and sustainable use of biological resources.²⁶ This is first visible in the fact that the Bill does not contain an objectives' clause which could have included some of the main principles accepted both at the international and national levels, such as the principles of precaution, prevention, equity and the need for participatory decision-making. Instead, the Bill focuses mainly on the question of access to resources.²⁷ Its response to the current challenges is to rely on the time-tested principle of permanent sovereignty over natural resources. It proposes to

²³ Patents (Second Amendment) Bill, 1999, Bill No. XLIX of 1999.

²⁴ Protection of Plant Varieties and Farmers' Rights Bill, 2000, Bill No. 123 of 1999 (revised version drafted by the Parliamentary Joint Committee, December 1999).

²⁵ See, e.g., U.S. Patent No. 5,401,504, *Use of Turmeric in Wound Healing*, issued 28 March 1995 and European Patent No. EP 0436257, *Method for Controlling Fungi on Plants by the Aid of a Hydrophobic Extracted Neem Oil*.

²⁶ Arguably, one reason for this is that the Environmental Protection Act, 1986 covers the field. However, this argument has been used repeatedly to excuse the failure to adopt domestic legislation in respect of international environmental treaties ratified by India. Cf. Michael Anderson, *International Environmental Law in Indian Courts*, 7 Rev. Eur. Community & Int'l Env't'l L. 21, 1998.

²⁷ The only substantive chapter of the Bill—Chapter II—is entitled *Regulation of Biological Diversity*.

put stringent limits on access to biological resources or related knowledge for all foreigners.

Two elements must be noted in this regard. First, it is striking that all foreigners are treated similarly. The provision was obviously conceived with OECD countries in mind, but the vast majority of developing and least-developed countries are in an even more difficult position than India. It is therefore surprising to find that no exception is made in favour of such countries which might benefit from facilitated access to India's vast biological resources. Second, while the Bill focuses its attention on the regulation of access by foreigners, it does not provide a strong framework for regulating access within the country. On the whole, the government is given very broad powers in this field while current holders of resources or knowledge at local levels do not have strong claims under the Bill.

It is interesting to put the question of the regulation of access in a broader context. The current assertion of a right to limit transactions is in complete contradistinction with the premises that have been at the centre of the work of the Consultative Group for International Agricultural Research (CGIAR) over the past few decades.²⁸ India has, like many other developing and developed countries, substantially benefited from the principle of free sharing of knowledge and resources on which the CGIAR's work was based. Indeed, India is one of the countries where Green Revolution varieties first engineered in CGIAR centres have had significant impacts on food production. The new Bill is likely to result in fewer flows of resources to CGIAR centres from India. While this is certainly regrettable, the Indian position can be seen as a reaction to broader trends.

The CGIAR centres are themselves abandoning the principle of common heritage of humankind in reaction to the general trend towards the appropriation of biological resources.²⁹ Overall, what is most striking about the Biodiversity Bill's insistence on sovereign rights is that it constitutes a reflection of current attempts by all actors around the world to assert property rights over whatever they can control. Whether this strategy will be of benefit even to a large country like India should be pondered in view of the fact that the CGIAR collections, over which India has no independent control, account for about 40 percent of the world-wide accessions for food crops.³⁰ Further, in a context where most countries of the world, including India, are highly dependent on genetic resources from other regions for their main staples,³¹ it is highly unlikely that closing the

²⁸ See, e.g., the agreements between the CGIAR Centres and the FAO placing collections of plant germplasm under the auspices of FAO, signed in 1994.

²⁹ See, e.g., CGIAR, *Progress Reports on IPR Matters and Proposal for Review of Plant Breeding*, Mid-Term Meeting 1999, Doc. MTM/99/20, 1999.

³⁰ See, e.g., Gigi Manicad, *CGIAR and the Private Sector: Public Good versus Proprietary Technology in Agricultural Research*, 37 *Biotechnology & Dev. Monitor* 8, 1999.

³¹ See, e.g., Ximena Flores Palacios/Commission on Genetic Resources for Food and Agriculture, *Contribution to the Estimation of Countries' Interdependence in the Area of Plant Genetic Resources*, Background Study Paper No. 7, Rev. 1, 1997.

avenues for sharing resources and knowledge will contribute to solving the widespread problem of malnutrition.

If the Bill focuses on preserving India's interests *vis-à-vis* other States in rather strong terms, its main impact within the country will be to concentrate power in the hands of the government. Indeed, Indian citizens and Indian legal persons must give prior intimation of their intention to obtain biological resources to the State biodiversity boards to be constituted under the Bill.³² The Bill is even more stringent in terms of intellectual property rights since it requires that all inventors obtain the consent of the National Biodiversity Authority before applying for such rights.³³ This provision is interesting at a conceptual level but will not have significant practical implications. First, patents, which are the most widely used intellectual property right in this field, are excluded from the purview of this clause.³⁴ Second, the Authority has no extraterritorial authority and cannot monitor applications for intellectual property rights outside of India.

With regard to intellectual property rights, the Bill implicitly takes the position that India cannot do more than regulating access by foreigners to its knowledge base. The Bill does, however, attempt to discipline the intellectual property rights system in some respects. As noted, it requires inventors who want to apply for intellectual property rights to seek the Authority's permission. It also authorizes the Authority to allocate a monopoly right to more than one actor. Further, the Authority is also entitled to oppose the grant of intellectual property rights outside India.³⁵ The Bill 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 so far as it provides that the Authority can decide to grant joint ownership of a monopoly intellectual right to the inventor and the Authority or the actual contributors if they can be identified.³⁶

However, the sharing of intellectual property rights is only one of the avenues that the Authority can choose to discharge of its obligation to determine benefit sharing. Further, it is in the Authority's power to allocate rights to itself or a contributor such as a farmer contributor and the latter has no right to demand the allocation of property rights. The other forms of benefit sharing are also progressive in so far as the Bill prioritizes non-financial benefits, such as transfer of technology, which are more long-lasting than financial compensation.³⁷

The Bill's main shortcoming, in terms of property rights, is that it focuses its efforts on sovereign appropriation and monopoly rights such as patents. The implication is that

³² Biological Diversity Bill, *supra*, footnote 22, Section 7.

³³ *Ibid.*, Section 6.

³⁴ Specifically, permission of the National Biodiversity Authority must be obtained before the sealing of the patent but can be obtained after the acceptance of the patent by the patent authority: see *ibid.*, Section 6.1.

³⁵ *Ibid.*, Section 18.4.

³⁶ *Ibid.*, Section 21.2(a).

³⁷ *Ibid.*, Section 21.2.

most of the property rights will be concentrated in the State and private actors. The centralization of property rights in the hands of the State through sovereign appropriation and in the hands of private inventors through monopoly intellectual property rights has the unfortunate consequence that the Bill does not provide a framework for the rights of all other holders of biological resources and related knowledge. The consequence of the proposed system will be that resources and knowledge which are not allocated to private entities through intellectual property rights will be deemed to be freely available.

The Bill does not give current rights holders the capacity to defend their rights in the same way that it seeks to equip the Indian State with tools to ward off biopiracy. This problem is reflected in several ways. First, in cases where benefit sharing is allocated in the form of money, the Authority can direct the payment to a Biodiversity Fund.³⁸ The proceeds from this Fund are then either channelled 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 since the decision resides with the Authority. Second, 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 goodwill. This is in contradistinction with applicants for patent rights who need the Authority's approval but cannot be stopped from applying for the right. Third, the Bill is conspicuously shy in its treatment of traditional and local knowledge. It only requires the Central Government to "endeavour to respect and protect" such knowledge.³⁹ The question is of sufficient importance that it should receive an answer in the Act instead of being left to the discretion of the executive.⁴⁰

On the whole, the Bill provides a property rights framework which seeks to be very firm on the question of access from outsiders even though the practical impacts of this stand will be limited because it cannot apply extraterritorially. The Bill condones the introduction of intellectual property rights in the management of biological resources provided for in the TRIPS Agreement but does not directly seek to make sure intellectual property rights are subordinated to the goals of the Biodiversity Convention as directed in Article 16 of the Convention. One of the striking features of the proposed 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.⁴¹

³⁸ Ibid., Section 21.3.

³⁹ Ibid., Section 36.4.

⁴⁰ For a different approach, see, for example, the Biodiversity Law of Costa Rica of 23 April 1998 which includes a specific section on *sui generis* community intellectual rights.

⁴¹ See, e.g., N.S. Jodha, *Common Property Resources and the Environmental Context*, 30 *Economic & Political Weekly* 3278, 1995.

B. *The Plant Variety Bill*

The Protection of Plant Varieties and Farmers' Rights Bill (Plant Variety Bill) was drafted in response to India's obligations under Article 27.3(b) of the TRIPS Agreement.⁴² Unlike the Biodiversity Bill which is a response to a very general treaty, the basis of this Bill is a specific provision requiring the introduction of plant variety protection. According to TRIPS deadlines, it should have been in place by 1 January 2000, but India is not the only country which is still in the process of putting its protection regime in place. Given its significance and the controversy it had generated even before being introduced in Parliament, the Bill 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 2000.⁴³ The Committee also put forward a substantially revised Plant Variety Bill.⁴⁴

In general, the Bill seeks to establish plant breeders' rights and farmers' rights. The proposed regime for plant breeders' rights largely follows the model provided by the UPOV Convention. It introduces rights which are meant to provide incentives for the further development of a commercial seed industry in the country. The criteria for registration are thus the same as those found in UPOV, namely, novelty, distinctiveness, uniformity and stability.⁴⁵ The Bill not only incorporates a number of elements from the 1978 version of UPOV but also includes some elements of the much more stringent 1991 version, like the possibility to register essentially derived varieties.

The section on farmers' rights has been completely changed by the Parliamentary Committee. Indeed, while farmers' rights were dealt with in a single provision in the first version of the Bill, the Committee has added a whole new chapter on farmers' rights. It felt that the Bill as introduced in December 1999 carried inadequate provisions for protecting the interests of the farmers.⁴⁶ The Bill makes an effort to put farmers' rights on a par with breeders' rights. Thus, it provides, for instance, that farmers are entitled, like commercial breeders, to apply to have a variety registered.⁴⁷ Farmers should generally be treated like commercial breeders and should receive the same kind of protection for the varieties they develop. However, it is unsure whether these provisions will have a significant impact in practice since the Bill accepts the registration criteria of the UPOV Convention which cannot easily be used for the registration of farmers' varieties. Apart from giving rights to farmers over new varieties, the Bill recalls the residual minimum rights that cannot be taken away from farmers.⁴⁸ It further seeks

⁴² See Protection of Plant Varieties and Farmers' Rights Bill, 1999, Bill No. 123 of 1999 (original version of December 1999 before revisions proposed by the Parliamentary Joint Committee).

⁴³ Joint Committee on the Protection of Plant Varieties and Farmers' Rights Bills, 1999, *Report of the Joint Committee*, August 2000.

⁴⁴ Plant Variety Bill, *supra*, footnote 24.

⁴⁵ *Ibid.*, Section 15.1.

⁴⁶ See *Report of the Committee*, *supra*, footnote 43.

⁴⁷ Plant Variety Bill, *supra*, footnote 24, Section 16.1(d).

⁴⁸ This provision is substantially similar to the one found in the *Draft International Undertaking*, *supra*, footnote 17.

to foster their partaking in some of the advantages to be obtained from the commercialization of registered plant varieties. Thus, it insists on the need for benefit sharing.

The Bill provides two different channels for claiming compensation. Section 26 and Section 42 both provide opportunities for receiving financial compensation. The main difference between the two is that Section 42 specifically targets village communities and provides less stringent procedural conditions. Thus, it neither provides a time frame nor specifies that claimants should pay a fee. In both cases, it is significant that the Authority has significant discretion in disposing of the benefit-sharing claims. Surprisingly, Section 42 comes closer to recognizing the intellectual contribution of the benefit claimers than Section 26. The former provides that claims can be made concerning the contribution to the evolution of a variety by a group while the latter only mentions the use of genetic material from the claimant variety as a basis for a claim. Further, while Section 26 requires the commercial utility and the demand for the variety in the market to be taken into account in the assessment of the claims, there is no such requirement under Section 42. The last major distinction is that Section 42 only provides for compensation to a community of individuals whereas a single person may benefit under Section 26. Overall, the existence of two partly overlapping, partly different regimes for benefit sharing is likely to be the cause of much confusion on the part of benefit-claimers and is unlikely to foster their claims for compensation. At a conceptual level, two main critiques can be raised against these benefit-sharing regimes. First, they divert attention from the issue of providing property rights. Second, even in the limited sense of financial compensation, the burden of proof is on the claimants who finally remain dependent on the Authority's decisions.

On the whole, the new elaborate section on farmers' rights is progressive but further rethinking of the conceptual framework of the Bill would be required to provide fully effective farmers' rights. This is first due to the fact that farmers' rights were only added as an afterthought to a regime based on the UPOV Convention. The criteria for registration of varieties were not rethought and still exclusively reflect the needs of registration for commercial breeders. Second, benefit sharing as envisaged does not contribute to strengthening the rights of farmers. It only fosters the recognition that actors who cannot apply for property rights should be offered some financial compensation.

C. *The Patents Amendment Bill*

The Patents Act of 1970 is less directly relevant to the allocation of property rights over biodiversity-related knowledge than the two previous Bills. However, it provides the generic framework for patenting in India and plays a pivotal role in this field. In general, the 1970 Act was based on the premiss that India accepted patents as a useful

tool to reward inventiveness but also recognized that the system had to be carefully bound to avoid undesirable social outcomes. The Act thus tried to balance the granting of monopoly rights with provisions to ensure that these rights were not used in a way detrimental to the public at large.⁴⁹ 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. If thus prohibited, for instance, the patentability of all methods of agriculture and horticulture or processes for the medicinal, surgical or other treatment of human beings.⁵⁰ Further, the Act drew a distinction between product and process patents. In the case of inventions claiming substances intended for use, or capable of being used, as food or as medicine or drug, or inventions relating to substances prepared or produced by chemical processes, inventors could only obtain a patent on processes of manufacture.⁵¹ It is noteworthy that the notion of "medicine or drug" covered insecticides, germicides, fungicides, weedicides and all other substances intended to be used for the protection or preservation of plants.⁵² Apart from restrictions on substance, the Act also introduced limitations to the term of the patent. While the normal term of the patent was fourteen years, in the case of process patents for substances intended for use as food, medicine or drug, the term was only seven years.⁵³ Further restrictions were provided on the rights of the patent holder. These included stringent provisions for compulsory licensing and for licences of right.⁵⁴

The ratification of the TRIPS Agreement means that significant changes must be brought to the Patents Act. A modification was already adopted in 1999 to put India in compliance with its obligations under Articles 65 and 70 of TRIPS.⁵⁵ This amendment modified Section 5 of the Act which prohibits product patents on food and drugs to permit the filing of applications for exclusive marketing rights.⁵⁶ All the other modifications necessary to put India in compliance with its WTO obligations have been incorporated in a second Patents Amendment Bill introduced in December 1999.⁵⁷

In general, there are a number of fundamental differences between the 1970 Act and the TRIPS Agreement which are forcing India to substantially modify its patent legislation to be in compliance with its international obligations. Thus, the duration of the patents will have to be brought from seven years in the case of process patents on

⁴⁹ Cf. Rajeev Dhavan and Maya Prabhu, *Patent Monopolies and Free Trade: Basic Contradiction in Dunkel Draft*, 37 J. Indian L. Institute 194, 1995.

⁵⁰ Patents Act, 1970, Section 3.h(i).

⁵¹ *Ibid.*, Section 5.

⁵² *Ibid.*, Section 2.1.1.

⁵³ *Ibid.*, Section 53.

⁵⁴ *Ibid.*, Chapter XVI.

⁵⁵ See Patents (Amendment) Act, 1999, Gazette of India, 26 March 1999. This amendment was finally adopted following cases brought by the United States and the EU to the WTO Dispute Settlement Body. See, e.g., *India—Patent Protection for Pharmaceutical and Agricultural Chemical Products (U.S. Complaint)*, Report of the Panel, 5 September 1997, WTO Doc. WT/DS50/R; and *India—Patent Protection for Pharmaceutical and Agricultural Chemical Products (U.S. Complaint)*, Report of the Appellate Body, 19 December 1997, WTO Doc. WT/DS50/AB/R.

⁵⁶ See Patents (Amendment) Act, *ibid.*

⁵⁷ See Patents (Second Amendment) Bill, *supra*, footnote 23. The Bill should have theoretically been adopted by 1 January 2000 to allow India to be in compliance with its TRIPS obligations. It was referred to a Joint Parliamentary Committee. See, e.g., *Patents Bill for Joint Committee*, The Hindu, 22 December 1999.

food and drugs and fourteen years for others to a uniform twenty-year period. The sections governing the working of the patents will have to be substantially modified. Licences of rights, for instance, will not be available any more while the conditions for compulsory licensing will have to be changed.⁵⁸ Indeed, the provision which seeks to oblige patentees to manufacture their inventions in India will have to be struck out because of the TRIPS requirement that imports should not be treated differently from products locally produced.⁵⁹

The TRIPS Agreement does not give countries much leeway to adapt their patent laws as they see fit. The few openings that are provided, for instance in Article 27.2, are used in the Patents Amendment Bill. In particular, the environmental and health exceptions are drafted into Section 3 which defines what is not an invention under the Act. Thus, the Bill 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 Bill not only retains the exception concerning product patents for food and drugs but now specifies that it also excludes biochemical, biotechnological and microbiological processes.⁶⁰ In reaction to concerns over biopiracy and the unwarranted use of traditional knowledge, the Bill first proposes to impose the disclosure of the source and geographical origin of biological material used in an invention.⁶¹ 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.⁶²

III. THE PROPOSED PROPERTY RIGHTS FRAMEWORK IN PERSPECTIVE

The Indian Parliament is about to adopt a revised property rights regime concerning biological resources. This is mainly linked to the international treaties India has ratified over the past decade. Indeed, in the case of the Patents Act, it is striking that the two Patents Amendment Bills of 1999 constitute the first set of major changes since its adoption in 1970. While the three Bills under consideration do not deal exclusively with property rights, their allocation constitutes one of the most significant elements of the regime being put in place.

A. *The Three Bills in Context*

In general, the three Bills fall within a rapidly changing international policy framework. One of the recent trends has been a shift away from common property rights regimes at the international and domestic levels. Further, emphasis has been put

⁵⁸ Patents (Second Amendment) Bill, *ibid.*, clause 37.

⁵⁹ *Ibid.*, clause 39; TRIPS Agreement, *supra*, footnote 2, Article 27.

⁶⁰ Patents (Second Amendment) Bill, *supra*, footnote 23, clause 5.

⁶¹ *Ibid.*, clause 8.

⁶² *Ibid.*, clauses 17 and 28.

in recent decades on the sovereign rights of States and private property rights. The two trends have not necessarily been considered together and the results may be inconsistent on the whole. These have generally been accompanied by a greater emphasis on the economic valuation of biological resources and the lesser importance of concerns with the fulfilment of basic needs.⁶³ Even though recent trends have been clearly in favour of extending the reach and scope of private rights, in particular intellectual property rights, there are now limited signs that some States and other actors are realising that broader ethical, environmental or social concerns must also be incorporated in property rights regimes. Concerns range from consumer distrust of genetically modified organisms, in particular in European countries, to the fear that genetically modified seeds with the “terminator technology” may drastically affect farmers. One of the responses is the progressive development of biosafety measures as illustrated by the adoption of a Biosafety Protocol to the Biodiversity Convention.⁶⁴ The Plant Variety Bill incorporates some of these concerns by restricting the acquisition of plant breeders’ rights in cases where the variety includes genes that limit its reproduction.⁶⁵

The trend towards broadening the scope of private property rights has a number of consequences in the specific field of biological resources. One of the issues relates to the limits of appropriation currently imposed. While the introduction of property rights has been strongly encouraged concerning the products of research based on biological resources, there has been significant resistance in the research and business communities to the extension of intellectual property rights to the materials used for research in laboratories.⁶⁶ In effect, this implies that biological resources remain a common heritage of humankind that can be freely used and appropriated. However, there are a number of cases where research in laboratories does not start from materials found in nature but from materials tended by human communities, such as farmers or healers. In such cases, while the legal framework does not normally grant the holders of knowledge related to biological resources any intellectual property rights, it is progressively being acknowledged that some form of compensation must be offered in cases where this knowledge is used by outsiders.

The concept of benefit sharing formalizes this conception of compensation. Benefit sharing is often associated with a form of financial compensation, as exemplified by the Plant Variety Bill.⁶⁷ The setting up of a fund to which the proceeds from benefit sharing are to be channelled constitutes the main instrument through which the mechanism will

⁶³ Cf. A. Vaidyanathan, *India's Agricultural Development Policy*, 35 *Economic & Political Weekly* 1735, 2000.

⁶⁴ Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Montreal, 20 January 2000, reprinted in 39 *Int'l Legal Mat.* 1027, 2000.

⁶⁵ Plant Variety Bill, *supra*, footnote 24, Section 18.1(c).

⁶⁶ See, e.g., John H. Barton, *The Biodiversity Convention and the Flow of Scientific Information*, in K. Elaine Hoagland and Amy Y. Rossman (eds.), *Global Genetic Resources: Access, Ownership and Intellectual Property Rights*, 51, Association of Systematics Collections, Washington, D.C., 1997.

⁶⁷ For an alternative plant variety bill which recognizes benefit sharing as a sharing of rights and does not include a fund, see *Protection of Plant Varieties Bill*, proposed by the Public Interest Legal Support and Research Centre, on file with the author, 2000.

be put into practice. While benefit sharing is an interesting concept, its application through financial compensation implies that money is offered in place of property rights.⁶⁸ Indeed, the most important element of new property rights regimes focusing on biological resources should be to recognize the need for a system which takes into account the variety of actors which contribute to the development of knowledge in this field and recognizes that monopoly rights do not provide an appropriate answer in this field. Apart from the diversity of actors, policy-makers should also consider the fact that monopoly rights in this field tend to promote commercialization in areas fundamentally linked to the fulfilment of basic needs, such as food and health. Further, the introduction of monopoly rights is also likely to lead to more monocultures which are themselves detrimental to the conservation of biodiversity. In the case of plant variety protection, for instance, one of the possible answers is to set up a property rights regime where farmers and commercial breeders are on a par in principle and in practice.

Another issue of importance concerns the treatment reserved to biological resources. These resources, like all other natural resources, are covered by the principle of sovereignty over natural resources. The principle includes, among other elements, the right of States to freely exploit their natural resources. Over time, even though the principle has been frequently reiterated, exceptions have developed. Thus, the conservation and management of biodiversity are now a "common concern of humankind" which implies at least a loose right of regard into States' policies in this context.⁶⁹ Historically, the call for the establishment of the principle of permanent sovereignty came from newly decolonised countries.⁷⁰ Interestingly, debates over the status of plant genetic resources have seen developing countries arguing in favour of sharing with the rest of humanity and some developed countries steadfastly opposed to this.⁷¹ One of the reasons why there was agreement—though no consensus—at the FAO to recognize plant genetic resources as a common heritage of humankind was the realisation that States can do very little to keep control over them. At present, the options open to individual countries are scant in so far as their control over biological resources is not fully effective. Further, countries need to address the dichotomy between the reiteration of sovereign rights over natural resources and the willingness to provide monopoly intellectual property rights. This contradiction must be tackled if the proposed legal regimes are not to insist on national sovereignty in theory while mainly providing rights that benefit private enterprises, often from other countries.

The question of biopiracy also warrants further consideration as it is addressed in all three Bills. There are two main kinds of biopiracy. The first concerns the patenting of knowledge which is in the public domain. This is typically what happened in the case

⁶⁸ As noted, the benefit-sharing provisions of the Biodiversity Bill go much further, to include the sharing of property rights and technology transfer.

⁶⁹ See Biodiversity Convention, *supra*, footnote 1.

⁷⁰ See generally Nico Schrijver, *Sovereignty over Natural Resources—Balancing Rights and Duties*, Cambridge University Press, Cambridge, 1997.

⁷¹ See International Undertaking, *supra*, footnote 16.

of the turmeric patent, successfully contested by the Indian government.⁷² This type of biopiracy can be eliminated by improving the availability of written sources concerning local knowledge, by making sure that all patent offices around the world have access and make the effort to access all relevant knowledge, and by forcing applications to obtain prior informed consent from the countries from which they have used knowledge or resources.⁷³ Steps are currently being taken to improve the accessibility of such information, for instance, by improving Web-based data sources,⁷⁴ and within India by registering in written form as much local knowledge as possible. It is also at this level that the Patent Amendment Bill seeks to intervene.⁷⁵

The second type of biopiracy is linked to the different levels of protection provided in different countries. Thus at present, while no method of agriculture can be patented in India, the same may be patentable in the United States.⁷⁶ The significant discrepancies that exist between the legal regime in India and in OECD countries will be substantially reduced because of the TRIPS Agreement. Indeed, the central effect of TRIPS is to force all countries to adopt minimum standards of protection which are not far from the levels of protection which were already afforded in OECD countries before 1995. If all countries had the same standards of intellectual property protection, there would not be much scope for biopiracy. However, TRIPS does not aim to provide similar levels of protection throughout the world. In fact, it specifically allows countries to go beyond what is required under TRIPS.⁷⁷ In areas where OECD countries decide to strengthen the protection offered, there will always be scope for the patenting of inventions which are not patentable in India, even under the regime adopted in compliance of the TRIPS Agreement. It is now generally agreed that the Indian government cannot go on fighting individual patents in foreign jurisdictions. Indeed, the costs of filing a challenge to a single patent on basmati in the United States and the time involved are such that it is absolutely unrealistic to expect any Biodiversity Authority to have the time and resources to fight all the patents that may have to be contested around the world.⁷⁸ A solution does not lie in trying to ever-strengthen intellectual property rights protection to match levels afforded in developed countries. On the contrary, developing countries will only be able to solve the problems they are facing by obtaining limitations on the scope of patentability to be applied world-wide.

⁷² See *Use of Turmeric in Wound Healing*, *supra*, footnote 25.

⁷³ This has, in fact, been proposed by India; see WTO, *Protection of Biodiversity and Traditional Knowledge—The Indian Experience*, WTO Doc. WT/CTE/W/156—IP/C/W/198, 14 July 2000.

⁷⁴ The Global Biodiversity Information Facility, available at: <<http://www.gbif.org>>, constitutes one effort at the international level to provide a network of databases providing information on biodiversity.

⁷⁵ See above, Section II.C.

⁷⁶ See, e.g., 35 United States Code 161.

⁷⁷ TRIPS Agreement, *supra*, footnote 2, Article 1.

⁷⁸ See, e.g., R. Ramachandran, *Challenging the Basmati Patent*, 17/10 Frontline 79, 2000, showing the extent of work involved in mounting a challenge on the basmati patent.

B. *Links between the Proposed Laws*

The three Bills introduced in Parliament deal with the issue of property rights over biodiversity and related knowledge. Given the proximity of the subject-matter, it is surprising that these three Bills are not more closely co-ordinated. At present, the proposed framework is marked by significant overlaps and inconsistencies and a lack of overall structure.⁷⁹ The regime for benefit sharing in the Plant Variety and Biodiversity Bills clearly illustrates these kinds of problems. As noted, the Biodiversity Bill offers a broad definition of benefit sharing which encompasses various alternatives, from monetary compensation to transfer of technology and the grant of joint ownership of intellectual property rights. In contrast, in the Plant Variety Bill benefit sharing is conceived only as a form of monetary compensation. However, it is striking that the procedure for determining the benefit-sharing claims is much more clearly outlined in the Plant Variety Bill. In principle, one would expect a generic benefit-sharing mechanism to be outlined in the Biodiversity Bill and to find only elements that differ from the common regime in the Plant Variety Bill. Further reasons militate in favour of an integrated approach. Thus, while the Biodiversity Bill provides that joint ownership can be granted as a form of benefit sharing, it is apparent that under the Plant Variety Bill, the definition of the rights of communities precludes joint ownership and the provision clearly refers exclusively to monetary compensation.⁸⁰

In general, the three Bills do not relate to each other in a clear way. Thus the Biodiversity Bill, introduced in Parliament after the other two, only mentions that the provisions of the specific section calling for pre-approval of the Biodiversity Authority in the case of applications for intellectual property rights does not apply in the case of plant varieties.⁸¹ There is no general statement concerning the relationship between these two Bills and no mention of the existence of these Bills in the Patents Amendment Bill. To come back to the previous example, benefit sharing is a consequence of the different status in law of different bodies of knowledge. Knowledge which does not qualify for protection under monopoly rights is rewarded in different ways under benefit-sharing schemes. Benefit sharing is thus a consequence of the existence of monopoly rights such as patents, and this clear link between the Patent and Biodiversity Bills needs to be highlighted. This is not only a question of principle since some of the provisions dealing with intellectual property rights in the Biodiversity Bill may remain inoperative otherwise. Indeed, the Patents Amendment Bill does not provide for any joint ownership of the kind proposed in the benefit-sharing provision of the Biodiversity Bill and it is to be feared that if the two Bills are not integrated in this regard, the Biodiversity Bill provision will simply not apply.

The drafting of three Bills reflects the status of the international legal regime and

⁷⁹ Cf. Dwijen Rangnekar, *To Balance Regulation and Compliance*, 17/25 Frontline 95, 2000.

⁸⁰ Plant Variety Bill, *supra*, footnote 24, Section 42.

⁸¹ Biological Diversity Bill, *supra*, footnote 22, Section 6.

India's commitments in this regard. While the necessity to provide a form of protection for plant varieties stems from an Agreement which hardly shares anything with the Biodiversity Convention, the implementation of the two treaties relates to a single reality and a single subject-matter. Plant varieties are but a subset of biological resources and should be treated as such. Indeed, the Biodiversity Bill clearly defines biological resources as including plant varieties, and in fact also regulates plant varieties.⁸² If it is not possible to adopt a single law, some of the most serious overlaps should at least be tackled. This includes, for instance, the establishment of two National Authorities to deal with biodiversity and plant varieties.⁸³ Other inconsistencies include the twin mechanisms for allocating rights and benefits in the case of benefit sharing. Such discrepancies are unnecessary unless they relate to an area where the plant variety regime should be different either by virtue of its specificities or by virtue of the requirements of the TRIPS Agreement.

The relationship between the Biodiversity and Patents Amendment Bills also warrants mention.⁸⁴ The unsolved problem of the relationship between the TRIPS Agreement and environmental agreements surfaces here. To mention but one example, the section of the Biodiversity Bill providing that the Authority can impose benefit sharing on the applicant for a patent may prove controversial.⁸⁵ Indeed, a similar provision negotiated in the context of the revision of the Undertaking was challenged by some countries as being potentially incompatible with the TRIPS Agreement.⁸⁶ A clear statement on the relationship between the two Bills may thus be necessary in the same way that some countries have been arguing for a clarification of the relationship between the TRIPS and environmental treaties.⁸⁷ In this context, the Biodiversity Bill proposed by the Law Commission should be borne in mind. It proposed that no provision of the TRIPS Agreement "in so far as it is inconsistent with any of the provision of this Act, shall have effect."⁸⁸ While such a provision would not allow India to remain in compliance of its TRIPS obligations, it signals that there are definite tensions between the two regimes that must be addressed if the environmental regime is not to become automatically subsidiary to the intellectual property rights regime.

⁸² *Ibid.*, Section 2.

⁸³ Currently, Section 8 of the Biological Diversity Bill, *ibid.*, establishes a National Biodiversity Authority and Section 3 of the Plant Variety Bill, *supra*, footnote 24 establishes a Plant Varieties and Farmers' Rights Protection Authority.

⁸⁴ Note that the relationship between the Plant Variety Bill and the Patents Amendment Bill is explicitly considered in so far as the latter specifically mentions that plant varieties are not patentable. See clause 4 of the Patents (Second Amendment) Bill, *supra*, footnote 23.

⁸⁵ Biological Diversity Bill, *supra*, footnote 22, Section 6.

⁸⁶ See Commission on Genetic Resources for Food and Agriculture, *Texts Established by the Contact Group during its Fourth Inter-Sessional Meeting*, Fourth Inter-Sessional Meeting of the Contact Group, Doc. CGRFA/CG-4/00/TXT, 2000, at Article 14.2.d.(iv) and accompanying notes.

⁸⁷ See, e.g., WTO, *The Relationship between the Provisions of the Multilateral Trading System and Multilateral Environmental Agreements (MEAs)*, WTO Doc. WT/CTE/W/139, 2000; and *Clarification of the Relationship between the WTO and Multilateral Environmental Agreements*, WTO Doc. WT/CTE/W/168, 2000.

⁸⁸ Law Commission of India, Biodiversity Bill (One Hundred Seventy-First Report on Biodiversity Bill, January 2000), at Section 3.

C. *Considering other Dimensions: The Case of Human Rights*

Property rights over biological resources and related knowledge cannot be considered only an environmental point of view. Indeed, their allocation has significant socio-economic or human rights implications. The links between human rights and intellectual property rights have been considered in the context of human rights instruments for a long time. Indeed, intellectual property rights have been enshrined in human rights instruments. The Covenant on Economic, Social and Cultural Rights thus recognizes, for instance, the rights of authors to the protection of the moral and material interests resulting from their scientific, literary or artistic production.⁸⁹ At the same time, the Covenant acknowledges that everyone has the right to enjoy the benefits of scientific progress and its applications.⁹⁰ The tension between the two provisions can only be reconciled if the rights granted to the author are not absolute. Indeed, intellectual property law recognizes this tension and solves it by, for instance, demanding from the person being granted patent rights that they disclose the invention and by limiting the duration of the right. The TRIPS Agreement specifically requires that there should be a balance of rights and obligations.⁹¹

Broader human rights-related considerations should also be contemplated. Indeed, the question is not only to balance the right of an author to his/her production with the interests of society at large. One of the central questions that is brought by the human rights dimension of intellectual property is the scope of the subject-matter that can be protected. There should, for instance, be restrictions on the patentability of inventions that are incompatible with the protection of human rights.⁹² This constitutes one of the starting points of the debate concerning the patentability of life forms even though the link with human rights is often not made explicitly. In the context of the Bills currently under consideration, the issue of the scope of intellectual property rights is of central importance.

Even though the TRIPS Agreement provides a rather strict framework from which derogations are difficult, it also encompasses a recognition that health and nutrition are essential sectors and that States can adopt measures to promote the public interest in sectors of vital importance to their socio-economic development.⁹³ It is noteworthy that the Law Commission, in its draft biodiversity bill, attempted to use these provisions by providing that no intellectual property right should be granted on species used for alimentary or medicinal purposes.⁹⁴ This constitutes an attempt to integrate the right to food with the exceptions allowed in the TRIPS Agreement. However, since TRIPS

⁸⁹ Article 15.1(c) of the International Covenant on Economic, Social and Cultural Rights (International Covenant), New York, 16 December 1966, reprinted in 6 Int'l Legal Mat. 360, 1967.

⁹⁰ *Ibid.*, Article 15.1(b).

⁹¹ TRIPS Agreement, *supra*, footnote 2, Article 7.

⁹² Cf. Audrey R. Chapman, *Approaching Intellectual Property as a Human Right: Obligations Related to Article 15(1)(c)*, UN Doc. E/C.12/2000/12, 2000.

⁹³ TRIPS Agreement, *supra*, footnote 2, Article 8.

⁹⁴ See Law Commission of India, *supra*, footnote 88, Section 9.i.(c).

exceptions are subject to the qualification that they should be consistent with the provisions of the Agreement, it is unlikely that such a provision would be acceptable under Article 27.2 which only allows exceptions where the commercial exploitation of the invention is likely to have detrimental human rights impacts but does not permit the blanket exclusion of such inventions in law. Even if the kind of exclusion provided by the Law Commission goes too far for TRIPS compliance, there is no doubt that intellectual property rights are bound by human rights considerations. Indeed, while the Covenant recognizes authors' moral and material interests to their inventions, it recognizes just as clearly everyone's right to food and health.⁹⁵ The extension of the scope of intellectual property rights to sectors directly linked to food and health must thus be provided within a framework which fosters the realisation of these rights too.

CONCLUSION

India is, like many other developing countries, at a crossroads with regard to the development of a new legal regime concerning the management of biological resources and related knowledge. First, according to its obligations under the TRIPS Agreement, it must introduce a new intellectual property rights regime which not only mandates plant variety protection but also a number of other significant changes. Second, it must adopt a biodiversity management regulatory regime which complies with its other international obligations such as those under the Biodiversity Convention. Third, it must address a host of other issues linked to the broader process of globalization. It must, for instance, adapt to an environment where the free sharing of knowledge which constituted the basis for the development of all Green Revolution varieties is becoming increasingly outdated. While the demands of the international legal framework for the sustainable management of biological resources are much less constraining in practice than the demands stemming from WTO-related Agreements, sustainable management of biodiversity will first of all benefit the country itself. Further, given the central importance of the agricultural sector in social, economic and environmental terms, the definition of a new property rights regime in this area which does not take into account the social, human and environmental dimensions is unlikely to be generally beneficial to the country.

The responses that India is trying to give reflect the variety of factors that it must deal with. Thus, the focus of the Biodiversity Bill on regulating access by foreigners constitutes a twin acknowledgement that countries cannot work on the basis of free sharing in the current environment which privileges appropriation, and that the only thing they can do is to attempt to regulate the flows of resources and knowledge as far as they control them. The current international regime is clearly very strict in some regards but the strictness of the patents regime under TRIPS is, for instance, tempered by the *sui generis* option for plant variety protection and there remain a number of areas

⁹⁵ See International Covenant, *supra*, footnote 89, Articles 11 and 12.

where the law is not settled. India and other developing countries thus get different chances to influence the shape of things to come. At the domestic level, they can, for instance, take full advantage of the possibility to devise *sui generis* property rights systems in such areas as plant variety or traditional knowledge. At the international level, different negotiations are currently addressing some of the issues relevant to the appropriation of biological resources and related knowledge, such as the yet to be completed review of Article 27.3(b) of TRIPS and the draft revised FAO International Undertaking.

The three Bills currently before Parliament perfectly reflect the difficulties that a country like India has in trying to comply with all its international obligations. The significant inconsistencies between the different relevant treaties do not help. However, even if India must today adapt to a new environment which does not favour the sharing of knowledge and resources, it seems essential that interests, such as the fulfilment of basic needs of the majority of the population, or in other words basic human rights, should not be sidelined. In this respect, the proposed framework is less than ideal.

The growing controversies within India over some aspects of the WTO regime and the growing awareness concerning the allocation of real and intellectual property rights over biological resources have already led the Joint Committee on the Plant Variety Bill to substantially modify this Bill. It is not impossible that other significant changes will be made to this and the other two Bills before they are eventually adopted by Parliament.