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# Biodiversity: Between Diverse International Arenas

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## Introduction

The large number of international environmental agreements has been negotiated without explicit measures to resolve the frequently overlapping and conflicting goals of economic regimes.<sup>1</sup> The relative strength between environmental and economic regimes, whether in terms of power and interest structure or in terms of normative persuasion, has yet to be put to any ultimate test. This article examines the interrelationship between one environmental and one trade-related regime, dealing with biodiversity and intellectual property rights respectively.

In response to the rapid loss of species and ecosystem decay world-wide, the Convention on Biological Diversity (CBD) was agreed to in Rio in 1992. Two years later the Trade-Related Aspects of Intellectual Property Rights (TRIPs)—a formal agreement under the World Trade Organization (WTO)—was established. How do the functional scopes of these institutions overlap and what are the implications for the implementation of the objectives of the CBD?<sup>2</sup> The following analysis will show that the overlap between the CBD and TRIPs concerns both diverging regulations pertaining to the same issue-area and also that the two regimes build on diverging norms and principles.<sup>3</sup> The CBD as a global environmental treaty is concerned with conservation and equitable sharing of benefits derived from the world's biological resources. The TRIPs, being part of a trade regime, resents policies that obstruct trade liberalization in any sector—including biotechnology, which is based on the utilization of biological resources. These overlaps may have negative implications for implementation of the CBD on account of asymmetrical strength in the relationship between the two institutions.<sup>4</sup> Institutions geared towards issues with significant effects for security or economy are likely to be given precedence—for instance, by being equipped with stronger compliance mechanisms by the negotiating states.

Three aspects of institutional overlap will be discussed: norms, regulations, and relative strength. First, the different normative approaches to property rights to genetic material inherent in the CBD and TRIPs will be examined. This provides a picture of the background for the

institutional overlap. The next section presents the explicit regulations of the two regimes pertaining to the issue-area. The remaining sections deal with the subject of relative strength. The first of these examines the role of norms in the formation of the biodiversity regime. I then discuss the outlook for implementing the objectives of the CBD in light of the institutional overlap. Finally, the international efforts to deal with institutional overlap are presented. This includes a judgement of the strengths of the regulatory and compliance mechanisms of the CBD and TRIPs respectively.

## Institutional Overlap: The Role of Diverging Norms

The issue of biological diversity constitutes one of today's greatest challenges, for two main reasons:

- First, the concern with biodiversity stems largely from our increasing awareness that, viewed against the natural average rate, the current rate of species extinction is extremely high.<sup>5</sup>
- Second, as the new biotechnologies greatly enhance the potential utility areas of the world's genetic resources, economic incentives to conserve biological diversity increase.<sup>6</sup>

These developments have had a profound impact on the understanding of property rights to genetic resources—a question on which the CBD and TRIPs display basic normative differences. TRIPs seeks to bolster and harmonize intellectual property rights (IPR) systems, such as patent legislation, in all technological fields world-wide—including biotechnology. The CBD advocates national sovereignty to, and equitable sharing of benefits from, utilization of genetic resources. The background for these diverging views is described here.

The main objective of the CBD is threefold:

- 'to ensure conservation of biological diversity<sup>7</sup> and
- sustainable use of its components; and

- to promote a fair and equitable sharing of the benefits arising out of utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, and by appropriate funding' (Article 1).

The normative orientation towards equitable sharing, which is a central trait of the CBD, builds on the understanding that costs and benefits of biodiversity have long been asymmetrically distributed—and that this situation needs to be remedied if anyone at all will benefit in the end. The CBD stipulates that those who have the ultimate responsibility of carrying the costs of conservation and sustainable use of the resources must also be given a fair and equitable share in the benefits derived from this use. The major bulk of species diversity is found in the tropical countries of the South. The North possesses the technological strength to exploit the resources commercially and the economic strength to ensure private rights and royalties through patents.

The contrast between the normative approach of the CBD and TRIPs can be traced back to the opposing views on the merits of patents within the field of biological material. A patent is a contract between researcher and society—the researcher making their invention public, rather than keeping it a secret, and society offering royalties for using the invention for a limited period of time. The idea is to provide incentives for innovative research by compensating for the time and costs going into research. The basic principle of the TRIPs agreement on intellectual property rights is to enhance trade liberalization by harmonizing national patent legislation systems.

The economic need for patenting, as seen from the northern biotechnology sector, is based on the high costs of research in biotechnology. The biotechnology sector has been arguing strongly for compensation in terms of royalties, along the lines of other fields of technology.

Along with the developments in biotechnology, there have been legal reinterpretations of national patent laws. There has also been strong pressure to harmonize national patent legislation through TRIPs in the Uruguay Round of the General Agreement on Tariffs and Trade (GATT).<sup>8</sup> Legal reinterpretations were necessary to overcome the technical barriers to patentability. Traditionally, the patent system was limited to technologies dealing with non-organic material. Biological products or processes were originally excluded from patentability on the basis that such inventions could not meet the fundamental patent criteria: *novelty* (not published anywhere before), *inventive step* (the invention must display non-obviousness), *industrial utility* (the invention must have a practical application, to distinguish between basic research and applied technology, which is eligible for patenting), and *re-*

*producibility* (the application must describe the invention in such detail that other experts may repeat the experiment and arrive at the same results). In addition to these criteria, patent legislation commonly excludes from patentability inventions whose utilization would run counter to *public order or morality*.

However, patenting within biotechnology poses several contentious questions. The biological-conservation-equity dimension opposes the patent-legislation dimension on several aspects.

- **Biological aspect:** Is a product patent on naturally occurring organisms fulfilling the criteria of novelty and inventive step? Biological material was traditionally regarded as a natural rather than an industrial product—a discovery rather than an invention.<sup>9</sup> The process of isolating and describing a micro-organism or a gene may, or may not, be defined as 'inventive enough' to meet this criterion.
- **Social contract aspect:** Unlike traditional breeding methods, the new biotechnologies may meet the reproducibility criterion. However, many biotechnology patent applications fail to fulfil the reproducibility criteria—hence the deal with patents as an alternative to secrecy is forfeited and scientific exchange is impeded.
- **Moral aspect:** There are moral concerns regarding exclusive rights to food, medicinals, and living material. This is based on the notion that food and medicinals should be excluded from patentability because of their fundamental importance to basic human needs.
- **Equity aspect:** Patenting is a long and costly business that can be employed only by large companies—hardly by indigenous and local communities.<sup>10</sup> Patenting may thus be incompatible with fair and equitable sharing of the benefits derived from use of genetic resources.
- **Environmental aspect:** A contested question concerns whether intellectual property rights represent a direct threat to genetic diversity in agriculture. Supporters of intellectual property rights argue about the need to introduce high-yielding varieties, and they have linked to this the use of plant breeders' rights and patents, as preconditions for food security. Opponents argue that the precondition for food security lies in the conservation and sustainable use of a variety of (non-systematically bred) farmers' cultivars or land races. They go on to say that the patent and plant breeders' rights criteria of reproducibility and 'uniform, stable and distinct from existing varieties'<sup>11</sup> inevitably lead to monocultures and loss of genetic diversity.

These controversies indicate the fundamental difference between the normative orientations of the two regimes. While social equity and environmental concerns constitute the basis for the norms and principles engendered by the CBD, TRIPs promotes the privatization of genetic resources through individual rights. Regardless of the 'real' rights and wrongs of the debate, the latter three controversies in particular go to the very core of the bioregime. These controversies may thus represent a barrier to the implementation of the objectives of the CBD—conservation, sustainable use, and equitable sharing.

### Institutional Overlap: Diverging Regulations

#### *The TRIPs regulations on property rights to genetic resources*

Questions concerning the widening scope of industrial patents were brought up in the Uruguay Round (1988–94) of the GATT. The final text of the agreements established the World Trade Organization (WTO), including the TRIPs Agreement, and was adopted in April 1994. The TRIPs discussion soon became one of the fiercest arenas for the North–South patent controversy. The USA, Japan, and (less adamantly) the EU advocated the principle that all countries should provide and respect intellectual property protection in all technical fields—including biotechnology. Disregarding this principle would constitute a contravention of GATT regulations, making the offending country liable to economic sanctions.<sup>12</sup>

Governments in the South strongly opposed the GATT TRIPs proposals, arguing that patents benefit those states that are already technologically and economically strong.<sup>13</sup> This point was hard to refute, as the South holds no more than 1 to 3 per cent of all patents world-wide.<sup>14</sup> In the initial rounds, India argued against patenting of plant and animal varieties as well as food and pharmaceutical products, citing concern for basic human needs. Moreover, many developing countries maintained that the application of IPR systems would hinder the transfer of technology to the developing world. They also claimed that this system would disregard the very real contributions of generations of farmers to the world's plant genetic resources, the basis of global food security.

The opposition has had some success in GATT. This was partly a result of the mitigating effect of the European Patent Convention (Art. 53(b)), which at the time allowed plant varieties to be excluded from patentability. The final agreement on TRIPs contains the following decisions:

- it grants parties the right to exclude from patentability (Art. 27.3(a)) diagnostic, therapeutic, and surgical methods for the treatment of humans and animals, and (Art. 27.3(b)) plants and animals other than micro-organisms;<sup>15</sup>
- it obligates parties to introduce some kind of intellectual property rights for *plant varieties*. TRIPs requires members to provide for the protection of *plant varieties*, either by patents or by establishing an effective *sui generis* system (a legal system of its own kind). *Sui generis* could mean joining the Union for the Protection of New Varieties of Plants (UPOV);
- it obligates those WTO member states that choose the *sui generis* laws to establish these by January 2000. The least developed countries have until 2005 to fulfil their TRIPs obligations. Developing countries may hence create systems better suited to their present needs. In 1999 the *sui generis* option within TRIPs will be up for review by the member states.

#### *The CBD Regulations on Property Rights to Genetic Resources*

At the start of the biodiversity negotiations the North's interpretation of the principle of common heritage of mankind did constitute the international regime for exchange of and access to plant genetic resources (seeds). International gene banks were stocked with seeds from the most commonly used food plants. These seeds were collected primarily from the extensive variation found in the South, and the gene banks were based on the North's interpretation of the common heritage principle—*open access, free of charge*.<sup>16</sup>

In response to the developments in GATT among others, developing countries claimed national sovereignty over their genetic heritage, demanding that it be regarded as a national asset along the lines of other natural resources, such as oil and minerals.<sup>17</sup> National sovereignty ended up as the only passageway for reaching consensus about property rights between the North and the South in the CBD text.<sup>18</sup> The CBD states that each country has the sovereign authority to determine access to its genetic resources—through *prior informed consent* and on *mutually agreed terms*. Hence the CBD establishes a new type of property rights regime, where national sovereignty is introduced to counterbalance intellectual property rights. The principle of national sovereignty to natural resources has little material basis. This is because of the 'elusive' character of genetic resources—with actual limited control over these resources in the South. The CBD has no retroactive effect in legal terms; hence the North still has free access to large quantities of genetic resources through the international gene banks.<sup>19</sup>

The CBD equity provisions include:

- provision of new and additional financial assistance to developing countries, over and above Official Development Assistance, to cover 'agreed full incremental costs' of implementing the Convention (Art. 20.2)
- transfer of environmentally safe technology, including biotechnology and technologies covered by intellectual property rights, on 'fair and most favourable terms' (Art. 20)
- obligations for developed and developing countries to share equitably benefits arising from utilization of the knowledge, innovations, and practices of indigenous and local communities with the countries concerned (Art. 8, and 12th preambular)
- obligations to advance priority access to developing-country parties and to share equitably the benefits and the results of research and development arising from the commercial or other utilization of genetic resources, particularly with developing-country parties providing access to genetic resources (Art. 15)
- obligations to advance priority access to developing countries and to share equitably the results and benefits arising from biotechnologies, based on genetic resources, particularly with developing-country parties providing access to genetic resources (Art. 19).

In addition, Article 16(5), says that intellectual property rights systems should 'not run counter to the objectives in the CBD'. This is the place where the diverging regulations and norms of trade regimes, aimed at the biodiversity issue-area, are most explicitly referred to.

Whereas the TRIPs regulations are moulded mainly by the interests of transnational corporations and developed countries, the CBD text is largely reflecting the position of the South. The next two sections address the questions of why this was so and whether this is a trend that will continue in the implementation phase.

### Norms and Power in the Formation of the CBD

Was the TRIPs a strategic move by the North to counter the objectives in the CBD? One interpretation of the South's breakthrough in the CBD could be that the North stopped worrying about the output in the biodiversity negotiations, being confident that their interests would be secured by the TRIPs regulations in the WTO. In the same vein, it would seem that the issue has been raised to a higher level. It is now subject to potential conflict between international institutions, as well as between states. This interpretation may go some way in explaining the output. On the other hand, it disregards the fact that it was originally the North that started out pushing for the establishment of the CBD. First,

the CBD was initially part of the North's global environmental agenda, and while WTO/TRIPs touches on central aspects of this issue area it is certainly not a tool for conservation of biodiversity. Second, the CBD text explicitly seeks to counter the possible detrimental effects from WTO/TRIPs. It counters intellectual property rights by introducing *national sovereignty*, *prior informed consent*, and *mutually agreed terms* to regulate access to biological resources. Third, this interpretation does not explain why the United States as the sole OECD country still refuses to ratify the CBD: the USA was certainly not satisfied with the output.

What are the respective strengths of the two institutions? On the normative level, the TRIPs principles of liberal trade theory with industrial patents as part of the package have rather wide support. In the face of this agenda, the claim for 'national sovereignty' in the CBD may appear as protectionism—a barrier to effective trade. On the other hand, the principles of shared benefits and equity in the CBD did achieve legitimacy in the international negotiations.

These observations appeal for a further discussion of the particular institutional setting for these negotiation games. Let us first consider the interplay between power and institutions. Industrialized countries generally dominate fora on economy and trade. Trade regimes may obviously have a greater overall impact, as they define the economic and trade-related framework by which a large array of policies in other sectors must abide. The developing world is highly dependent on market access and also vulnerable to economic sanctions. Hence the rules established by the WTO carry much weight. International fora on economy and trade have strong ramifications to principles connected to high salient issue-areas at the national level.

This links up to the interplay between norms and institutions and how this may affect negotiation results. It is easier for the developing countries to win through with their arguments in UN-related fora such as the Food and Agricultural Organization (FAO) and the United Nations Environment Programme (UNEP) compared to international fora on trade and economy—where use of economic sanctions represents a convincing threat.<sup>20</sup> It is likely that the particular arena of the UNEP biodiversity negotiations gave rise to a recognition that these biological resources did indeed belong to the South. While such sentiments would probably have less impact in fora on economy and trade, the goals associated with the biodiversity negotiations in UNEP may have made the parties more receptive to accepting the legitimacy of granting the South their 'rights'. Moreover, the final stages of negotiating the CBD were conducted at the UN Conference on Environment and Development (UNCED). The

norms in the UNCED setting were even more clearly geared towards appeasing the South.<sup>21</sup> The timing may also have played a positive part. As the UNCED Earth Summit approached, and global public attention with it, it became necessary for high level politicians to achieve a credible outcome during this meeting. This underscores the importance of institutions in framing international negotiation outputs.

On the other hand, choosing the UN forum to advocate their environmental agenda may be seen as a strategic move on the part of the North. They could hardly expect acceptance for environmental change in developing countries from regulations originating from any other forum.<sup>22</sup> This means that the manner in which related aspects of the issue has been and is being dealt with in overlapping and partly competing fora may still carry overall structural effects. Dominant actors may still have their way, as they may have a stronger impact on choosing the 'right' forum for advocating their interests. UNCED was clearly the best forum in which to achieve some kind of environmental concessions from the South, whereas the WTO could be used by the North to maintain the economic upper hand.

### Implementing the CBD: The Impact of Institutional Overlap

The relationship between intellectual property rights (IPR) systems and the CBD objectives represents a basic challenge for future implementation activities. The focus here is on the relationship between IPR and the principle of equitable sharing as a precondition for conservation and sustainable use of biodiversity in the South.

From a legalistic perspective one of the most relevant formulations in the CBD is the *prior informed consent*. This implies in legal terms that the country providing genetic resources (the owner country) must provide national legislation regulating the appropriation of genetic material.<sup>23</sup> A weak point in this regulation is that, in order to turn down a request for genetic material, the providing country may have to refer to such legal provisions. In the absence of such provisions, there is still a substantial risk that the gene flow must continue free of charge.<sup>24</sup> This may represent an impediment to governments, especially in low income countries, which lack administrative capacity both to enact and to enforce a legal framework.<sup>25</sup>

The practical operation of the prior informed consent principle depends on compatible legislation in user countries. User countries may improve the effectiveness of the prior informed consent rule by enacting national legislation on the import side. Along the lines of the rules governing international trade in endangered species of flora and fauna,<sup>26</sup> national legislation could be tailored to pro-

hibit illegal importation of genetic resources (such as collections conflicting with prior informed consent export rules in the providing country). Likewise, companies and other importers could be obliged to keep records of imported genetic material in order to facilitate monitoring by government authorities. Another suggestion is to require patent applications to give information about how genetic material was obtained.<sup>27</sup>

Among user countries, few efforts can be found. What might have been a striking example of implementation activities moving in the right direction relates to the EU directive on biotechnology patents. Nine years after its initiation by the EU Commission, the directive was subject to yet another amendment by the European Parliament. The Parliament voted to demand safeguards against 'genetic piracy' in developing countries, and wanted explicit commitments to honour the EU's obligations under the CBD. The amendments included demands that the EU's international biodiversity commitments be balanced against obligations to legislate on patents in accordance with GATT and TRIPs. The amendments would require that, when inventions involve biological material of animal or plant origin, patent applications would have to specify their geographical origin and evidence that the material was used in accordance with the legal access and export provisions in force in the place of origin.<sup>28</sup> In the end, the Parliament's amendments were greatly watered down by being moved to the preamble.<sup>29</sup>

The CBD mentions explicitly that the contracting parties shall respect, preserve, and maintain knowledge and practices of *indigenous and local communities*, and encourage the equitable sharing of the benefits arising from utilization of such knowledge and practices. The process of enforcement is less clear, as this brings up the tricky question of interference in domestic affairs, as well as how to identify who should be rewarded.<sup>30</sup> One approach to ensuring the interests of local and indigenous people may be to include and elaborate some kind of community rights. This may either be part of national law as a *sui generis* system or within a protocol under the CBD. Community rights apply to collectives and not individuals—and hence are regarded as incompatible to intellectual property rights systems. The revision of TRIPs in 1999 may show whether community rights can be accepted as a *sui generis* system.

There are some examples of the concept of equitable sharing gaining legitimacy among collecting agencies (private sector users). The UK Royal Botanic Gardens at Kew now states that any net profits derived from collaboration will be shared equally between itself and the supplier. Shaman Pharmaceuticals develops new pharmaceuticals from higher plants and is committed to returning a portion of the profits from its products to all communities and countries in which it works. There is also the case of Biotics, a

private British for-profit company that acts as a broker between companies and in-country collectors, granting the latter 50 per cent of Biotics' royalties.<sup>31</sup> The International Co-operation Biodiversity Group (ICBG) is a network of bioprospecting projects sponsored by the US National Science Foundation and the National Institutes of Health (NIH). The 34 projects provide financial rewards to local people, investments in research, and strengthened local institutions in developing countries.<sup>32</sup>

A number of adverse activities can, however, easily be found. Two Australian government agencies have recently been patenting chickpea seeds collected from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India.<sup>33</sup> This is a clear violation of the deal between the FAO and the Consultative Group on International Agricultural Research (CGIAR) making germplasm in international agricultural research centres part of the FAO international network of gene banks. The deal operates on the principle of free access combined with the principle that users will not patent the material. In practice, a number of violations are occurring, with 40 infringements by Australian organizations and corporations alone.<sup>34</sup>

### Dealing with Institutional Overlap

The Conference of the Parties (COP) to the CBD has put much emphasis on examining the relationship between the CBD objectives and the strengthened IPR systems. In Buenos Aires 1996, COP3 asked the Executive Secretary to 'liaise with the Secretariat of the World Trade Organization to inform it of the goals and the ongoing work of the CBD and to invite the Secretariat of the WTO to assist in the preparation of a paper for the COP that identifies the synergies and relationship between the objectives of the CBD and the TRIPs Agreement.' Moreover, COP3 issued a *declaration on intellectual property rights*, encouraging governments and organizations to submit case-studies to the Convention's Executive Secretary on the impact of intellectual property rights in regard to the Convention's three main objectives. As the Committee on Trade and the Environment of the WTO began discussion of the relationship between environmental protection and TRIPs in June 1995, it centred on the relationship between that and the CBD. The relationship between TRIPs and CBD will also be a central topic to the review of the TRIPs in 1999.

A crucial question is whether these are actually efforts to come to grips with the diverging regulatory rules of the two regimes. Mere co-ordination of the functional scopes of the CBD and the TRIPs is hardly sufficient to deal with the problems emerging from their opposing norms and regulations:

There are some indications that the potential conflict is taken seriously. A document from COP3 points out three

areas of possible complementarity as well as areas for conflict.<sup>35</sup>

- First, *mutually agreed-upon terms* for access to genetic resources could allocate intellectual property rights (IPR) as part of the benefits to be shared among parties to an agreement on genetic resources. Such IPR could be defined under TRIPs-compatible IPR systems.
- Second, the CBD and TRIPs could develop procedures for exchanging relevant information. Countries implementing measures that implicate both agreements, such as rules requiring patent applications to disclose the country of origin of biological material, might report them to the TRIPs Council, while at the same time disclosing the same information to the clearing house mechanism for scientific and technical co-operation established under Article 18(3) of the CBD.
- Third, there is a proposal to require or encourage disclosure in patent applications of the country and community of origin for genetic resources and informal knowledge used to develop the invention. As regards the potential conflict area, national measures to promote technology transfer under CBD Article 16 might raise *most favoured nation* issues if Convention parties and non-parties were treated differently. It might also raise TRIPs issues if owners of proprietary technology were compelled to license technologies on grounds other than those prescribed in the TRIPs Agreement.<sup>36</sup>

Several factors indicate the stronger regulatory force of the TRIPs:

- Intellectual property rights and patenting in the biotechnology sector is a contested, but relatively small, part of a larger issue-area concerning patenting and international trade. The driving forces in this much wider issue-area are powerful and gaining in strength as the opposition is declining with the economic developments in newly industrialized countries (NIC).
- NICs are increasingly accepting patenting as beneficial to their own economies, thus splitting up what used to be a strong and concerted opposition from the South. This development is not likely to be significantly restrained by the CBD objectives. Still, the CBD may have had a mitigating effect in providing pressure for a period of grace for the developing countries (that is, WTO members) in accepting patent systems.
- If WTO members refuse to sign up to TRIPs, they become liable to economic *sanctions*.<sup>37</sup> This makes the WTO a more powerful instrument than the CBD, which does not carry any sanction mechanisms.

- The WTO is also a stronger institution in terms of its compliance mechanism, incorporating different sets of *timetables* for countries to harmonize their patent legislation. The CBD does not provide timetables for parties to comply with its objectives.

The WTO/TRIPs is stronger both in terms of institutional mechanisms and in being controlled by the more powerful states. On the other hand, the legitimacy of the CBD principles is increasing, and there is ample evidence that the issue has been accepted as an important one in the WTO and the CBD alike. The issue has been institutionalized by providing for continued discussions between the two, as well as by institutionalizing representation in the respective fora. The final result of these deliberations is still far from certain, and it is likely to remain a contested international issue for a long time.

### Future Prospects and Barriers

Implementation of the CBD objectives will depend partly on the capacity of developing country governments to enact and enforce appropriate domestic legislation. A crucial question for the implementation of the CBD is, however, whether northern governments will comply with the new regime regulating access to and exchange of genetic resources and technology. Whether compensation for use of genetic resources will become a viable concept depends on whether the new dual property rights regime of the CBD will take hold. Perhaps paradoxically, it is the private sector that has taken the largest steps in this direction. The private seeds collection agencies may be more open to seeing the potential competitive advantage of building a fair and above-board image in germplasm transactions. This trend is far from all-inclusive, but it is nevertheless ironic that the public sector seems to be intimidated by what they perceive as a demand from the same private sector actors to provide the biotechnology industry with strong patent systems.

As to whether the TRIPs regulations on patenting will have harmful effects, for instance, for farmers in developing countries, the answer is probably no, in the short-term perspective. One of the underlying threats in the expanding patent legislation—that farmers must pay royalties for reusing seeds – is still a long way from being enforceable. A far more harmful long-term effect of the TRIPs patent regulations is that they reinforce a North–South conflict line in an issue-area where common solutions and co-operation are of paramount importance.

Concern for competitiveness in the biotechnology sector may increasingly take precedence over concerns for improved conservation and equitable sharing of benefits in the biodiversity issue-area. If the TRIPs principles pre-

vail this would essentially imply that those who have the ultimate responsibility for carrying the costs of conservation and sustainable use of the resources will not be given a fair and equitable share in the benefits derived from this use. According to the inherent logic of the CBD, this would undermine efforts to reach the objectives of conservation and sustainable use of biological diversity.

### Notes and References

I would like to thank Helge Ole Bergesen, Bruce Davis, Regine Andersen, and Steinar Andresen for very helpful comments on this article.

1. For a more general examination of the relationship between trade and environmental regimes, see the article in this edition of the *Yearbook* by Beatrice Chaytor and James Cameron, 'The Treatment of Environmental Considerations in the World Trade Organization'. See also Konrad van Molkte (1997), 'The Structure of Regimes for Trade and the Environment', in Oran Young (ed.), *Global Governance: Drawing Insights from the Environmental Experience* (Cambridge, MA: MIT Press).
2. This is resting on the assumption that principles, norms, rules, and procedures may have an independent role in moulding behaviour and enhancing domestic implementation among the negotiating parties. The term *implementation* is used to indicate a deliberate effort by national authorities to follow up their international commitments in domestic policies within the specific issue-area.
3. *Regimes* are defined as 'implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given issue-area': S. Krasner (1982), 'Structural Causes and Regime Consequences: Regimes as Intervening Variables', *International Organization*, 36/2, 185–205. *Institutions* are more broadly defined as 'recognized patterns of behaviour or practice around which expectations converge': Oran R. Young (1982), 'Regime Dynamics: The Rise and Fall of International Regimes', *International Organization*, 36/2, 277. 'Regime' and 'institution' are frequently applied interchangeably, as will also be the case here.
4. For a theoretical elaboration of the concept of overlapping institutions, see Oran R. Young (ed.) (1997), *Global Governance*.
5. For example, the average species lifetime of mammals in fossil records is in the order of 1 million years, which would mean roughly 0.5 extinctions per 100 years for the present mammalian fauna of nearly 5000 species. In fact, however, the current rate of extinction of mammals is roughly 100 times higher than this background rate. In other taxa the discrepancy may be even greater (V. H. Heywood (ed.) (1995), *Global Biodiversity Assessment* (Cambridge: Cambridge University Press), 232). Estimates of the number of existing species in the world vary from about 5 million to 100 million, of which only some 1.7 million have been described scientifically (see: E. O. Wilson (ed.) (1988), *Biodiversity* (Washington, DC: National Academy Press) and E. O. Wilson (1992), *The Diversity of Life* (Cambridge, MA: Harvard University Press)).
6. While the 'old' biotechnology includes such traditional activities as brewing beer and baking bread, the concept of 'new biotechnologies' refers to activities such as tissue culture and recombinant-DNA (r-DNA) techniques. By the year 2000, farm-level sales of products of agricultural biotechnology are expected to have reached some \$US 100 billion. As of 1986 the value of global trade in plant-based pharmaceuticals was

- estimated to be \$US 20 billion (Report of Panel II, UNEP/Bio.Div/Panels/Inf.2, Nairobi, 28 April 1993). Three years later, in 1989, the market value in the North of medicinal plants from the South was estimated to be \$US 43 billion. See: P. P. Principe (1989), 'Valuing the Biodiversity of Medicinal Plants', in O. Akerele, V. Heywood, and H. Syngé (eds.), *The Conservation of Medicinal Plants* (Cambridge: Cambridge University Press).
7. 'Biological diversity' is a broad concept which has been used to embody the variability among all living organisms, including diversity within species, among species, and among ecosystems.
  8. For a more extended exposé of the developments in patent legislation, see G. Kristin Rosendal (1995), 'The Politics of Patent Legislation in Biotechnology: An International View', in M. R. El-Gewely (ed.), *Biotechnology Annual Review* (Amsterdam: Elsevier), 453–76.
  9. More about this in R. S. Crespi (1988), *Patents: A Basic Guide to Patenting in Biotechnology* (Cambridge: Cambridge University Press).
  10. The trend is for transnational corporations (TNCs) to register patents in developing countries, not in order to operate their technology there, but to prevent others (especially locals) from copying or using their technology. Thus they may protect these markets for the sale of their products produced in northern countries. (Third World Network (1990), *The Uruguay Round and Third World Sovereignty* (Penang: Third World Network), 30).
  11. Union for the Protection of New Varieties of Plants, 1978, para. 2.
  12. TRIPs also incorporates the GATT's 'national treatment' and 'most favoured nation' principles. These principles prevent countries from giving priority to domestic industries or treating one importing country better than another. See article by Chaytor and Cameron.
  13. See GATT (1989), *Communication from India: Standards and Principles Concerning the Availability, Scope and Use of Trade-Related Intellectual Property Rights*, GATT Secretariat, MTN GNG/NG11/W/37, July.
  14. World Commission for Environment and Development (1987), *Our Common Future* (Oxford: Oxford University Press).
  15. Multilateral Trade Negotiations, the Uruguay Round, the Negotiations Committee, MTN.TNC/W/124, 13 December 1993, MNT/FA II–Annex 1C. Section 5, article 27 in the agreement on Trade-Related Aspects of Intellectual Property Rights.
  16. 'Technically', the collection of seed samples was considered by all as a non-rival and non-exclusive activity. Moreover, no one questioned this practice on moral grounds, as the seeds of our most utilized food plants were seen to be of basic significance to all mankind.
  17. Genetic resources differ, however, from oil and minerals in being non-rival and largely non-exclusive goods. Nor is species distribution necessarily confined to national borders. These characteristics will obviously hamper state control over genetic resources.
  18. For the first time in the operative text of a treaty the CBD incorporates the Stockholm Declaration Principle 21, which provides that 'States have . . . the sovereign right to exploit their own resources pursuant to their own environmental policies . . .'. Decided in Stockholm at the United Nations Conference on Human Environment (UNCHE), 1972.
  19. This involves the seeds collected before the CBD entered into force, 31 December 1993.
  20. For an extended analysis of the debate leading up to the arrangements in FAO, see G. K. Rosendal (1989), *A Sustainable Development for Plant Genetic Resources: The Output of the Debate in FAO; a Sisyphean Victory for an Environmental Organization?*, R: 010-1989 (Lysaker: Fridtjof Nansen Institute). For a corresponding analysis of the UNEP debate, see G. K. Rosendal (1991), *International Conservation of Biological Diversity: The Quest for Effective Solutions*, R: 012-1991 (Lysaker: Fridtjof Nansen Institute).
  21. Even though a recurring criticism from the South was that UNCED was concerned with 'the environmental agenda of the North', developmental issues were nevertheless more overt in this forum than in the preceding UN Conference on the Human Environment (Stockholm, 1972).
  22. More about this in G. Kristin Rosendal (1999), *Implementing International Environmental Agreements in Developing Countries: The Creation and Impact of the Convention on Biological Diversity* (Oslo: Oslo University Press).
  23. This article has been studied in detail by Frederic Hendrickx, Veit Koester, and Christian Prip (1993), 'Convention on Biological Diversity: Access to Genetic Resources: A Legal Analysis', *Environmental Policy and Law*, 23/6. Veit Koester played a central role throughout the biodiversity negotiation process, acting both as Chairman and Vice Chairman during various parts of negotiations, among other things leading Working Group II.
  24. See more about this issue in Frederic Hendrickx, Veit Koester, and Christian Prip (1993), 'Convention on Biological Diversity'.
  25. *Unilateral* initiatives in *owner* countries include the access to genetic resources of the Andean Pact and the Thai draft bill on a *sui generis* Plant Variety Protection Act, both seeking to protect the native plant varieties as well as the rights of farmers, local communities, and indigenous peoples. Countries which are in the process of developing access legislation and community/farmers' rights legislation include Brazil, Colombia, Ethiopia, India, South Africa, Tanzania, and Thailand. In addition, a number of countries are developing access legislation or community rights only: Argentina, Bolivia, Costa Rica, Ecuador, Indonesia, Mexico, Papua New Guinea, the Philippines, Venezuela, and Vietnam (Genetic Resources Action International (GRAIN) (1997), *Signposts to Sui Generis Rights*. Resource material from the international seminar on *sui generis* rights, Bangkok, 1–6 December 1997 (Bangkok: BIOTHAI & GRAIN). The enhanced consciousness regarding sovereignty over genetic resources is not confined to the South. After the signing of the CBD, Australia banned any plant or micro-organism from being taken out of the country before they themselves have bioprospected it.
  26. The Convention on International Trade in Endangered Species of flora and fauna (Washington, DC, 1973).
  27. See Hendrickx, Koester, and Prip, 'Convention on Biological Diversity'.
  28. *International Environmental Reporter*, 23 July, 1997, 713–14.
  29. This setback may, however, be changing if EU member states (such as the Netherlands), and European Economic Area members (such as Norway), succeed in fighting for the amendments to the patent directive proposed by the European Parliament. The Netherlands, later joined by Italy, filed a challenge to the EU 'Life Patents' directive (19 October, 1998), and the Norwegian government has pledged to veto the directive.
  30. In view of the problems facing developing country governments in connection with enforcing catch quotas for foreign fisheries under the UN Convention on the Law of the Sea (UNCLOS), the problems regarding regulation of genes are striking. In addition to the general administrative burdens, the non-exclusive character of genetic resources further complicates control of their movements. This is partly negated, however, by the need for a user to obtain information about the genetic material in question. Without this, it may be difficult to screen

genetic material for potentially valuable and interesting traits in secrecy.

31. More about conducts in bioprospecting in Sarah A. Laird (1993), 'Contracts for Biodiversity Prospecting', in *Biodiversity Prospecting* (Baltimore: World Resources Institute Publications), 99–130.
32. While the US Senate leadership still refuses to ratify the CBD, the Clinton administration is thus operational in implementing some of the main objectives of the CBD.
33. *New Scientist*, 14 February, 1998, 14.
34. *Ibid.*
35. UNEP/CBD/COP/3/23.
36. *Most-favoured nation* is a basic principle of the GATT/WTO regime, saying that any trade advantages conferred by one country to another must be given all GATT parties.
37. Membership in the two regimes is rather similar: By 1998 the WTO had 132 members and 34 observers, of which all but three have applied to join (the Vatican, Cape Verde, and Ethiopia), and about 170 states have ratified the CBD.

