UNEP

CBD

CONVENTION ON
BIOLOGICAL DIVERSITY

Distr.
GENERAL

UNEP/CBD/COP/3/22
22 September 1996

ORIGINAL: ENGLISH

CONFERENCE OF THE PARTIES TO THE
CONVENTION ON BIOLOGICAL DIVERSITY
Third meeting
Buenos Aires, Argentina
4 to 15 November 1996
Item 14.1 of the provisional agenda

THE IMPACT OF INTELLECTUAL PROPERTY RIGHTS SYSTEMS ON THE CONSERVATION AND SUSTAINABLE USE OF BIOLOGICAL DIVERSITY AND ON THE EQUITABLE SHARING OF BENEFITS FROM ITS USE

A Preliminary Study

Note by the Executive Secretary

Contents

/...

I. INTRODUCTION AND BACKGROUND

1. As background for Provisional Agenda Item 14.1, the consideration of the impact of intellectual property rights (IPR), this paper provides a preliminary review of the impact of intellectual property rights systems (IPR systems) on the conservation and sustainable use of biological diversit and on the equitable sharing of benefits from its uses, as requested by the second Conference of the Parties (COP). As a preliminary study of an area that is complex, technical and controversial, this paper cannot possibly be exhaustive. Instead, it reviews the range of viewpoints that have been expressed on the issue and provides examples of recent policy proposals. The Secretariat, by describing viewpoints or proposals, is not endorsing but simply reporting on this issue area. Based on this preliminary review, the paper also describes some options for future work under the Convention on Biological Diversity.

1.2 Conference of the Parties Decision II/12

2. Decision II/12 of the second COP asks the Secretariat, *inter alia*, to:

> u]ndertake a preliminary study which analyses the impact of intellectual property rights systems on the conservation and sustainable use of biological diversity and the equitable sharing of benefits derived from its use in order to gain a better understanding of the implications of Article 16(5). The study may focus on:
>
> > (i) exploring the relationship between intellectual property rights and the preservation and maintenance of traditional knowledge and practices of indigenous and local communities and the possible role of intellectual property rights in encouraging the equitable sharing of benefits arising from the use of such knowledge and practices; and

(ii) inviting Governments and other relevant stakeholders to submit case studies that address the role of intellectual property rights in the technology transfer process, in particular the role of intellectual property rights in the transfer of biotechnology".[1]

1.2 Relevant Provisions of the Convention

3. Decision II/12 asks the Secretariat to review the impact of IPR systems on the achievement of the Convention's objectives, with a focus on the relationship to knowledge and practices of indigenous and local communities. The COP indicated that the study should help to gain a □etter understanding of the implications of Article 16(5)".

4. Article 16(5) provides that the Parties, □ecognizing that patents and other intellectual propert rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives".[2] The use of the term □ay" implies that the negotiators could not agree on whether IPR have a positive effect, a negative effect, or a negligible effect on technolog transfer or on the achievement of the Convention □ objectives generally. This, in fact, can be seen as a textual basis for the present study.

5. The placement of paragraph 5 in Article 16 implies that if IPR have an impact on the Convention □ objectives, this is most likely to occur in the context of technology transfer, rather than in the context of conservation and sustainable use. The paragraph's language is, however, quite broad, implying the potential for influence on any of the Convention □ objectives or provisions. It also implies the possibility that Parties will need to take steps cooperatively to manage the influence of IPR to ensure that it is positive rather than negative.

6. Another instance in which IPR may relate to the Convention □ implementation is Article 8(j), which requires each Party, as far as possible and as appropriate and subject to its natio nal legislation, to □espect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices". The relationship of existing or modified IPR to the implementation of Article 8(j) is integrally related with the subject of this paper.

7. Also relevant is Article 11, which requires Parties to create economically and socially sound incentives for the conservation and sustainable use of the components of biological diversity, as far as possible and as appropriate. Existing or modified IPR, in the appropriate legal and institutional context, could provide such incentives.

8. Article 12(c) requires that Parties promote and cooperate in the use of scientific advances in biological-diversity research in developing methods for the conservation and sustainable use of

biological resources, taking into account the special needs of developing countries and in keeping with the provisions of Articles 16, 18 and 20. These activities could raise concerns regarding IPR protection of information provided to or accumulated by researchers.

9. Another example is Article 15, which establishes principles for the access to and sharing of the benefits of genetic resources. Identifying and allocating IPR will be an important part of controlling access to genetic resources and facilitating the fair and equitable sharing of benefits.

10. Intellectual property rights are likely to be relevant to the implementation of Article 17, which requires Parties to facilitate the exchange of relevant technical and scientific information, including indigenous and traditional knowledge both as such and in combination with technologies transferred under Article 16. This Article implicitly acknowledges that indigenous and traditional knowledge and practices are valuable for implementing the Convention, as are the biotechnologies and other high technologies contemplated in Article 16.

11. Article 18, requiring that Parties promote international scientific and technical cooperation, is relevant in that information exchanged or developed through such cooperation may be the subject of IPR. In particular, paragraph 4 states that Parties shall develop methods of cooperation for the development and use of technologies, including indigenous and traditional technologies, in pursuance of the Convention objectives. Questions regarding the application of existing IPR or modifications to IPR could also arise in the work of the clearing-house mechanism on technical and scientific cooperation provided for under paragraph 3 of this Article.

12. Article 19 requires Parties to take measures to provide for the effective participation in biotechnological research of other Parties providing genetic resources that are used in such research, especially developing-country Parties. It also requires them to take all practicable measures to promote priority access for Parties, especially those that are developing countries, to the results and benefits from biotechnologies based upon genetic resources provided by those Parties. Intellectual propert rights will play a fundamental role in the implementation of this requirement.

13. Finally, Article 20 requires each Party to provide according to its capabilities financial support and incentives for national implementation. To the extent that IPR create or can create financial incentives for implementation measures, they can contribute to implementation of this obligation.

1.3 Related Work

14. Intellectual property rights are linked in important ways to many provisions of the Convention. In part this stems from the underlying fact that much of the Convention focuses on the value of biological diversity as a source of genetic resources. Genetic resources are valuable as sources of information, genetic and chemical, that is valuable to humanity in many ways (Downes 1996; Swanson 1996a; Swanson 1996b). For example, this biological diversity information, when combined with research and development, can serve as a source of new products. In addition, the Convention places a heavy emphasis on the transfer, exchange, protection and use of other kinds of valuable information relating to conservation, sustainable use and benefit sharing, including information about technologies

ranging from biotechnology to indigenous technologies, traditional knowledge and innovations of indigenous and local communities, and scientific and technical information. Intellectual property rights systems are perhaps the principal legal mechanisms used in many societies to encourage the creation and dissemination of valuable new information. Thus, it is almost inevitable that IPR will play a role in the Convention implementation. This paper can cover only a limited part of the many important and complex interconnections.

1.3.1 Provisional agenda of the third meeting of the COP

15. A number of other items on the provisional agenda of the third meeting of the COP relate to the subject of this paper. Foremost is the consideration of a possible input into the discussions that are taking place in the Committee on Trade and Environment of the World Trade Organization (WTO) regarding the relationship between the Convention on Biological Diversity and the 1994 Agreement on Trade-Related Intellectual Property Rights (TRIPs Agreement) signed at the close of the Urugua Round of negotiations under the General Agreement on Tariffs and Trade (GATT) (Item 14.2 on the provisional agenda).

16. There are also many important links with the implementation of Article 8(j) regarding the knowledge, innovations and practices of indigenous and local communities (Item 11.1 of the provisional agenda). Another closely related agenda item is the consideration of the compilation of information and experiences shared on the implementation of Article 11 (Item 15.1). The issue of IPR and their impact on the Convention objectives also arises in the context of other agenda items, such as the consideration of agricultural biological diversity (Item 9.1) and the future work programme for terrestrial biological diversity (Item 10.3).

17. Also relevant is Item 12.1 on the provisional agenda, providing for consideration of the compilation of views of the Parties on possible options for implementing Article 15 b developing national legislative, administrative or policy measures. Item 13.1, the consideration of ways to promote and facilitate the access to and transfer of technology pursuant to Articles 16 and 18 is also relevant. Finally, Item 5, the report on the assessment and review of the operation of the clearing-house mechanism (CHM) may involve discussing IPR issues that arise in the collection, organisation and distribution of data in and through the CHM.

1.3.2 Proposed agenda of the fourth meeting of the COP

18. It is also worth noting that the mediu -term programme of work approved by COP II proposes that benefit-sharing be an item on the agenda for the fourth meeting of the COP. Item 7.4 on the work programme, onsideration of matters related to benefit-sharing", includes two sub-items: (a) t]o consider measures to promote and advance the distribution of benefits from biotechnology in accordance with Article 19"; and (b) to consider benefit-sharing in light of the outcome of discussions at the third meeting of the COP on ays to promote and facilitate access to and transfer and development of technology, as envisaged by Articles 16 and 18 of the Convention". Intellectual property rights will clearly be an important part of that discussion, and the COP may find it useful to make connections between this agenda item and that future discussion.

1.3.3 Other background papers and resources

19. Aside from the papers prepared by the Secretariat for the agenda items mentioned above, other papers of particular relevance include: *Traditional Related Knowledge and the Convention on Biological Diversity,* prepared by the Secretariat for the Inter-Governmental Panel on Forests established by the UN Commission on Sustainable Development (UNEP/CBD/SBSTTA/2Inf. 3); *Farmers' Rights and Rights of Similar Groups: The rights of indigenous and local communities embodying traditional lifestyles: experience and potential for implementation of Article 8(j) of the Convention on Biological Diversity* (UNEP/CBD/IC/2/14), prepared by the Interim Secretariat for the second meeting of the Inter-Governmental Committee on the Convention on Biological Diversity; and *Intellectual Property Rights and Transfer of Technologies Which Make Use of Genetic Resources* (UNEP/CBD/COP/2/17), which was prepared by the Secretariat for the second meeting of the COP at the request of the first meeting of the COP.

20. To assist the Convention on Biological Diversity Secretariat in the preparation of its study of the relationship between the TRIPs Agreement and the Convention, the WTO Secretariat released two previously restricted background papers that it prepared for meetings of the WTO Committee on Trade and Environment. These WTO documents are being made available to the COP as UNEP/CBD/COP/3/Inf.9 (*Environment and TRIPs*) and UNEP/CBD/COP/3/Inf.10 (*Factors Affecting Transfer of Environmentally-Sound Technology*).

1.4 Background on IPR Systems[3]

21. Intellectual property rights consist of special kinds of property rights. Like other property rights, IPR award the owner the right to exclusive use — that is, the right to exclude others from access to the resource. Intellectual property rights are distinctive, however, in that they create property rights over an *intangible* resource, consisting of certain types of information created by human beings. They are also distinctive in that they are limited in important ways. For example, most IPR are limited in duration, b definition — patents, for example, typically expire after twenty years. In essence, IPR award an individual a limited right of exclusivity as a reward (and thus an incentive) for his or her contribution to society through innovation and creativity, and as an incentive for the open distribution of information.

22. Basic categories of IPR found in many systems include patents, plant breeders' rights (PBRs), trade secrets, copyrights, and trademarks. IPR systems have evolved over time; for example, a special category of IPR was developed in recent years to protect the design of integrated circuits. The most relevant IPR categories for the purposes of this discussion are patents and PBRs, although trademarks and trade secrets also have some relevance.

23. Patents provide the inventor of a useful technolog — such as a mechanical or chemical product or process — with the exclusive right to reproduce or use the patented invention for a limited period, typically twenty years from the date the patent application is filed. Patents traditionally give the inventor rights only over a specific, incremental invention. The patent-holder has no rights over the use

of previous related but distinct inventions, or over the use of biological materials or other materials as they occur naturally that are used in the invention. The patent-holder can control subsequent related but distinct inventions only to the extent that they make use of or develop the patented invention.[4] It is important to recognise that a patent does not give the holder absolute rights to control the information needed to apply the invention. On the contrary, the holder must disclose that information to the public in order to obtain the patent, and the public is free to exchange and use that information except for the purpose of applying the invention. Additionally, many IPR systems provide for a "research exemption" that allows use of the patent for certain experimental purposes (WIPO 1990:4).

24. Plant breeders' rights are a system of patent-like rights specifically designed to provide breeders with the exclusive right to sell commercially a new variety that is novel, uniform and distinctive. PBRs frequently provide for certain exceptions to exclusive rights: the farmer's privilege, and the research exemption or breeders' privilege. Under the farmer's privilege, a farmer has the right to keep a part of the crop grown from PBR-protected seed and use it as seed for the next crop. The breeder's privilege authorises others to use a protected variety freely in research on or the development of new varieties.

25. A trade secret consists of information that is commercially valuable and whose holder makes reasonable efforts to keep it secret. In a number of jurisdictions, the holder may recover damages fro another who wrongfully appropriates and uses the secret. There is no limit on the duration of a trade secret, as long as the other requirements are met. Trademarks are discussed in paragraph 51.

26. The principal underlying rationale for IPR systems is that they serve an important function b creating incentives for investment in the development of innovations. Intellectual property rights such as patents and copyrights also create incentives for the open disclosure of valuable information about inventions and artistic creations.

27. Intellectual property rights are limited in scope because of the recognised need to balance the scope of such rights of exclusivity with the principle of free exchange and use of information in order to achieve a mix of social goals. Such goals include encouraging useful innovation; strengthening technological infrastructure and the capacity for technological research and development; freedom of discourse on social, cultural, scientific and political matters; and the equitable distribution of economic benefits.[5]

28. This balance is struck in a number of specific ways. For example, IPR systems generally allow for the protection of technological and artistic innovation, but not of scientific knowledge about natural phenomena; this distinction applies to both formal and informal knowledge. Another example is that the duration of IPR tends to be strictly limited (trademarks and trade secrets are exceptions), as alread noted. Inventors, creators or plant breeders must relinquish their exclusive rights at the end of a period of time defined by law.

29. The preferred balance among these principles changes over time for each society, and ma differ from one society to another. For example, national IPR systems differ in whether they recognise patents on genetically modified animals or plants. Early international agreements on IPR, such as the

1883 Paris Convention on Industrial Property, created relatively few international standards. With the growth of international trade, including trade in products subject to IPR, has come pressure for harmonising and strengthening IPR systems, especially from some developed countries with strong high-technology sectors. A number of countries have adopted more detailed standards for protecting plant varieties pursuant to the International Union for the Protection of New Varieties (UPOV). Most recently, the Uruguay Round of negotiations under the GATT produced the TRIPs Agreement, which commits all members of the WTO to adopting and enforcing minimum levels of protection for IPR.[6]

2. THE IMPACTS OF IPR SYSTEMS ON THE ACHIEVEMENT OF THE CONVENTION OBJECTIVES

30. This paper reviews examples of interactions between IPR systems and the Convention objectives within five general categories of issues.[7] They are:

(a) impacts on the traditional knowledge and practices of indigenous and local communities, which the COP identified as a focus for this study;

(b) impacts of IPR systems as indirect incentives affecting conservation and sustainable use;

(c) impacts of IPR systems on benefit-sharing through the development of technologies using genetic resources;

(d) impacts of IPR systems on the transfer of or access to technology and scientific information; and

(e) relationships between IPR systems and the clearing-house mechanism (CHM).

2.1 Impacts of IPR Systems on the Traditional Knowledge and Practices of Indigenous and Local Communities

31. The Convention on Biological Diversity recognises that the knowledge and practices of indigenous and local communities that embody traditional lifestyles relevant for conservation and sustainable use are important for achieving its objectives. This is because such knowledge and practices contain insights into biological resources and ecosystems, which can and should be a base for sustainable management and conservation systems for biological diversit and associated biological resources, along with scientific research (Berkes, Folke and Gadgil 1995). Communities' knowledge and practices are also potentially valuable as sources for the development of products in pharmaceutical, agricultural, industrial, food and other sectors (Balick 1994; Cox 1994; Farnsworth 1994; King 1996). It is important to note that such knowledge and practices are not themselves static, although they are based in traditional ways of life: thus, the Convention speaks of indigenous and local communities' nnovations" as well as their nowledge" and ractices".

32. Some commentators argue that existing IPR systems can create direct or indirect incentives for

continued investment by indigenous and local communities in maintaining traditional knowledge and practices, at least if they are combined with benefit-sharing arrangements entered into under the Convention. On the other hand, there are assertions that "existing protection mechanisms are insufficient for the protection of Indigenous Peoples Intellectual and Cultural Property Rights" (Mataatua Declaration 1993). There are claims that existing IPR systems encourage the erosion of such knowledge and practices, in part on the ground that there are inherent conflicts between IPR systems and knowledge systems that are "collective and intergenerational" (COICA 1994; see also Four Directions Council 1996). There is concern that IPR systems encourage the appropriation of such knowledge for commercial use without the fair sharing of benefits, or that they violate indigenous cultural precepts by encouraging the commodification of such knowledge (Ibid.).

33. A related concern is that the scope of IPR over some types of inventions in the formal sector, such as over biotechnology and plant varieties, has expanded in recent years. There are fears that this trend exacerbates an imbalance between the protection of formal knowledge developed by corporate researchers as against informal knowledge developed in indigenous and local communities. Examples include a grant of a patent on all forms of genetically engineered cotton, and a similar patent on genetically engineered soybeans, as well as patent applications for applications of human gene fragments (The Crucible Group 1994: 9-10, 20). Such trends toward more expansive IPR claims have raised controversy among researchers in these fields as well as concerns among the public and also citizens' groups in many countries (e.g., Plowman 1993; see also Bellagio Declaration 1993).

34. It appears, however, that there has been little objective analysis of specific instances involving actual or potential impacts of IPR on the traditional knowledge or practices of indigenous or local communities. Nevertheless, there appears to be preliminary agreement on a few basic factual points. First, IPR systems do not generally confer rights to countries or indigenous and local communities, or any other juridical or natural person, over naturally occurring genetic resources that originate within their territory or jurisdiction. Rather, such systems will confer protection over genetic resources altered by humans only to the extent that they have been altered by a sufficiently inventive and novel step within the terms of IPR systems.[8] Similarly, IPR systems are not likely to confer rights on indigenous and local communities for their knowledge of natural attributes or conditions, just as they do not generally confer proprietary rights to scientists or researchers in industrialised countries or elsewhere for knowledge, whether existing or new, of natural phenomena (see, e.g., Mays, et al. 1996).

35. There are a range of perspectives regarding future approaches. Many indigenous organisations oppose *per se* the commodification of knowledge or biological resources developed or maintained b their cultures and advocate curtailment of IPR on inventions derived in part from traditional knowledge or biological materials found in their territories (see COICA 1994). In contrast, other groups argue that IPR systems need to be modified to enable indigenous and local communities or individuals within them to claim IPR over their knowledge, or over innovations and practices, that relate to the sustainable use of biological diversity.

36. Some commentators, rather than argue for systematic reforms, proposed that indigenous and local communities and/or individuals within those communities can and should apply for and obtain control under existing IPR over use of their innovations (Gupta 1992). Support for this approach might

include increased financial and technical support from governments or international agencies for indigenous and local communities to work within the existing system. Similarly, there have been proposals to use measures under existing IPR systems to ensure that inventions derived from traditional knowledge remain in the public domain where they are essentially the same as existing products or processes already known in indigenous or local communities.

37. Some commentators have stressed that consideration must be given to other mechanisms in addition to IPR systems, because IPR measures may not prove the most effective mechanism available for protecting traditional knowledge. For example, there have been calls for new standards of practice for academic and commercial citation. These might involve, for instance, disclosure in academic and other publications of the names of the individual and community from which a researcher obtained information about informal knowledge, innovations or practices. They could also involve ethical standards that require procedures to ensure prior informed consent before gaining access to or publishing such knowledge; this could entail measures to ensure respect for concerns found in man cultures about keeping certain types of knowledge secret.

38. Other proposals involve the creation of new IPR, sometimes termed *sui generis* systems, for traditional knowledge of indigenous or local communities (UNEP/CBD/COP/3/19, Posey and Dutfield 1996). Such proposals raise numerous issues, such as the duration of rights and the legal identity of rights-holders. Perhaps because of the complexity of such issues, no proposal has advanced beyond a preliminary stage. Similar complexities arise regarding the curtailment or limitation of IPR over inventions derived in part from traditional knowledge or genetic resources held by local or indigenous communities.

2.2 Impacts of IPR Systems as Indirect Incentives Affecting Conservation and Sustainable Use

39. Another set of issues revolve around whether IPR on innovations derived in part from genetic resources, biochemicals and related biological resources can create indirect incentives for the conservation and sustainable use of those resources. Genetic resources contained in traditional varieties of domesticated crops, naturally occurring relatives of domesticated crops, and modern "improved" varieties, serve as resources for crop breeding and for agricultural and other biotechnology. A significant proportion of genetic resources, including traditional crop varieties as well as modern varieties, are not natural raw material, but result from human efforts in innovation and conservation. For traditional varieties, this often represents a long-term investment over many generations of informal innovation and stewardship, an investment that continues today in many indigenous and local communities.[9]

40. In addition, biological resources associated with genetic diversity in plant, animal and microbial species includes a diversity of chemicals found in various species that serves as sources of pharmaceuticals, cosmetics, food additives and industrial compounds. Plants and other biological resources are highly significant as sources of herbal medicines for local communities and national markets.

41. There is evidence that, as a general matter, IPR systems create incentives for private investment in innovation, producing new products that benefit society (e.g., Levin, et al. 1988; Mansfield 1993). While it is difficult to isolate impacts of IPR from the effects of other policies, they appear to encourage investment in certain industries such as crop breeding, that make significant use of genetic resources and related biological resources such as biochemicals (see Swanson 1996b, citing Perrin et al. 1983, Pray and Knudson 1994, and Huffman and Evenson 1993). Still, the evidence is not conclusive and there may be some negative impacts, for example on diffusion on technology, especially on certain groups or regions (Butler 1996; Jaffe and van Wijk 1995; Stallman and Schmid 1987).

42. Prior to the entry into force of the Convention on Biological Diversity, it is unlikely that IPR systems provided incentives in favour of conservation or sustainable use. Genetic resources were usually considered a common heritage, and users from other countries customarily returned no direct economic benefits to the countries or communities that provided and/or conserved the resources, although some international crop breeding programs sought to develop and distribute crop varieties for use in the developing countries that are the countries of origin for major food crops. Generally, researchers whose inventions qualified for IPR protection resided in developed countries, while the communities that lived near genetic resources and associated biological resources used in such inventions resided in developing countries and did not generally participate in the "advanced" research that led to IPR-protected inventions.

43. Such indigenous and local communities generally did not receive significant compensation if traditional knowledge or practices helped identify a naturally occurring compound that led to the development of a commercially valuable pharmaceutical or other product. Generally, traditional knowledge has not qualified for IPR protection under current laws; the inventive step that led to a commercial product suitable for patenting was considered to be taken in a research laboratory, usuall in a developed country.

44. It has been argued that IPR systems can operate as an indirect incentive for con servation only if they are coupled with some other legal mechanism that ensures the transfer of benefits to the resource providers. With the advent of the Convention on Biological Diversity, it has been argued that IPR systems can create indirect economic incentives for conservation. Intellectual property rights can encourage and reward the adding of value to genetic resources used as "aw materials". They can create indirect incentives, it is argued, when coupled with access and benefit -sharing agreements pursuant to the Convention that require the technology developers to transfer a share of the benefits to the providers of the genetic resources or associated traditional knowledge.

45. Others, however, suggest that IPR combined with such contractual arrangements are unlikely to accomplish benefit-sharing, and thus unlikely to create conservation incentives (Swanson 1996b). The point out that genetic resources and traditional knowledge, like innovations protectable by patents, have value because of their informational content. When such information is easily transferred and used, property rights analogous to patents will be needed to control effectively their use and ensure benefit-sharing. The reasoning is analogous to the rationale for granting IPR: a contract places legal controls on the use of information only as against those who sign the contract, whereas an intellectual property right is much more effective, because it controls use by all others within the jurisdictions where the IPR is

legally recognised.

46. In contrast, others claim that IPR protection creates "perverse incentives" that encourage the development of technologies that displace biological diversity (such as the monoculture of proprietar crop varieties) or threaten biological diversity (such as the inappropriate use of pesticides). For example, there are concerns that IPR-supported research is leading to the development of herbicide-resistant crop varieties the use of which may encourage a greater application of herbicides.

47. Intellectual property rights are also sometimes cited as a reason for the widespread erosion of thousands of traditional crop varieties, which typically contain diversity within as well as among varieties, and their replacement by a much smaller number of "elite" varieties. During the same period that the strength of IPR over plant varieties increased, vast numbers of traditional crop varieties disappeared (WCMC 1992). The requirement that a variety be uniform motivates breeders to reduce the internal genetic variation of the crop varieties they develop (Keystone Center 1991:14). Thus, "[t]o the extent that PBR is intended as an incentive to develop improved varieties, it contributes indirectly to the loss of landrace genetic diversity"(Op cit.: 13).

48. Other policies**,** however, have major impacts on the use of new crop varieties and the loss of traditional ones. Examples are:

(a) government farm credits and subsidies, and extension services;

(b) the policies and programs of international agencies and don or institutions;

(c) the marketing and research and development policies and programmes of transnational corporations; and

(d) the increasingly concentrated corporate control of pesticide and agri-biotechnolog research and distribution.

The extent to which PBR and other IPR, as compared to these factors, contribute to the displacement of traditional varieties and other changes in agricultural practices is unclear.

49. In addition, there are counter-arguments that IPR protection encourages conservation through the development of conservation technologies or through more efficient agricultural land use. For example, it is argued that IPR encourage the development of new crop varieties that reduce the pressure to convert land to agriculture by increasing yields and enhancing the pest-resistance of crops on existing farmland. With respect to the example of herbicide-resistant crop varieties, it is argued that while the development of such varieties may encourage the greater use of herbicides, some of these herbicides could replace more injurious ones used currently. There are also arguments that PBRs, b encouraging investment in plant breeding, may lead to an increase in the number of crop varieties (Keystone Center 1991:13, Crucible Group 1994:18).

50. A number of general proposals have been made for the creation of new categories of propert rights that would enhance incentives for conservation and sustainable use. For example, a number of commentators have proposed the creation of IPR-like property rights schemes that would confer property rights over biological information contained in genetic resources to the countries and/or communities of origin (see, e.g., Sedjo 1989; Vogel 1994; Swanson 1996b). Others have proposed an international "seed tax" on sales of crop varieties; the revenues would go to countries or communities of origin for genetic resources. The amount of tax, the identity of the authorities who would collect it, the nature of the institution that would distribute the revenues, the definition of the entities that would be eligible for receiving the proceeds, and the mechanism for allocating the funds, all remain unspecified. Implementation of farmers' rights through a multilateral fund, financed by developed countries, that would distribute grants to developing-country farmers has also been proposed, and raises similar questions about how it would be operationalised. All of these proposals have met with criticism.

51. There are several other proposals that are also somewhat more detailed. They include the following:

(a) **Development access of and benefit-sharing arrangements** and/or guidelines for such arrangements through the implementation of Article 15. Such arrangements can include the negotiated allocation of IPR between parties. A number of countries are moving forward with this option (see UNEP/CBD/COP/3/20 on access to and benefit-sharing from the use of genetic resources).

(b) **Disclosure in patent applications of the country and community of origin for genetic resources and informal knowledge used to develop an invention.** A number of commentators have argued that Parties should encourage or require such disclosure in their patent procedures (e.g., Gadgil and Devasia 1995), possibly also including the certification of prior approval of the use by the source country or community (e.g. Downes 1993). Possible elements of such a mechanism are outlined in *Knowledge, Innovations and Practices of Indigenous and Local Communities* (UNEP/CBD/SBSTTA/2/7). This type of action could implement Article 8(j) by promoting respect for indigenous and local traditional knowledge. It is worth noting that such disclosure may implicate other conservation concerns; for example, by affecting the rates of exploitation of species vulnerable to overexploitation.

There is evidence suggesting that disclosure of origin would in large part involve simply regularising a practice that is already common in filing patent applications. One recent study reviewed over five hundred patent applications in which the invention involved the use of biological materials, such as materials derived from plants or animals; most were in the pharmaceutical field, with some in other fields such as cosmetics and pesticides (Sukhwani 1996 and pers. comm.). The applications reviewed came from a number of jurisdictions, including France, Germany, UK, Spain, the USA, and the European Patent Office. Of the applications involving plants, the country of origin was invariably mentioned unless the plant was widely distributed or well known (such as the lemon or rosemary). A number of applications also mentioned indigenous or traditional uses as prior art.[10]

(c) **Restriction on the ability of users gaining access to genetic resources to maintai exclusive IPR protection over derived products.** For example, a Party could, as part of access regulations under Article 15, require that users obtaining genetic resources from within the Party jurisdiction must agree to issue a compulsory license on any future invention derived from those resources within the country of origin.[11] In other words, a contractual agreement to assign rights over future possible inventions would be part of what each user would trade for access, as part of mutually agreed terms.

(d) **Development of trademarks or appellations of origin for products of traditional knowledge or practices.**. A trademark gives a producer the exclusive right to use a distinctive, recognisable, reliable mark or name to distinguish its products from those of its competitors. Similarly, marks of geographic origin all w producers to identify their products as coming fro a specific region that is identified with quality and authenticity. Systems of geographic indications are used in a number of countries to regulate labelling of products historicall associated with certain regions (B ard and Marchenay 1996). Under the TRIPs Agreement, geographic indications as well as trademarks are included among the types of IPR for which WTO members must establish minimum levels of protection (see UNEP/CBD/COP/3/23). One way that indigenous and local communities might choose to maintain their knowledge innovation and practices relating to sustainable use could be to market products created using such knowledge, innovations or practices to consumers who prefer to support conservation or indigenous autonomy by buying such goods. To market successfully, producers need be able to present information about how their products were produced, and they must be able to prevent false claims. In light of this, some have suggested that trademarks or marks of geographic origin could reward communities and enhance economic incentives for sustainable traditions. Already there have been some efforts to develop such systems (Pinel and Evans 1994). Trademarks and marks of origin may also serve to protect the cultural and moral values of communities against commercial intrusion and exploitation. Another option might involve the application of concepts found in the Model Provisions for National Laws on the Protection of Expressions of Folklore Against Illicit Exploitation and Other Prejudicial Actions, developed b UNESCO and WIPO (WIPO 1985).

2.3 Impact of IPR Systems on Benefit-Sharing Through the Development of Technologies Using Genetic Resources

52. A related set of arguments revolve around the impacts of IPR systems with a focus on the issue of equitable benefit-sharing, rather than on conservation and sustainable use. Some critics argue that IPR systems favour the development of products that primarily benefit private industry and users in more lucrative markets in developed countries, and that do not respond to the needs of smaller, poorer farmers who cannot afford the expensive inputs needed to cultivate such varieties (Crucible Group 1994:17). Moreover, IPR systems are sometimes claimed to hinder the diffusion of useful new crop varieties to smaller, poorer farmers in developing countries who cannot afford to pay for such proprietary technology. In addition, there are complaints that the existing system is not equitable in that it does not reward indigenous and local communities at a level commensurate with their contributions

to the world plant genetic resources inputs in the form of creativity, ingenuity and work over man generations.

53. In contrast, defenders of existing IPR systems point out that IPR systems were not designed to distribute rewards equitably for a wide range of endeavours and activities, or for activities in the distant past. Rather, they are intended to create incentives in the present for a specific activity, a sociall productive investment in innovation. They are not designed to create proprietary rights or provide economic rewards for current populations in exchange for inventions or conservation efforts by their ancestors in generations past. On the contrary, in order to limit concentrations of economic power, IPR systems are specifically designed *not* to confer proprietary rights for more than a limited duration.

54. There appears to be increasing agreement that, over many generations, indigenous and traditional farming communities have contributed significantly to the world genetic resources and knowledge of biological resources. There is also considerable support for the principle that present-day communities should receive a greater share of the benefits from the use of genetic resources and traditional knowledge created from present inhabitants or previous generations. Significant disagreement remains, however, as to how these benefits should be dispensed, how large they should be, and how they should be distributed. In particular, there is little agreement about whether and how IPR systems should be modified to encourage a different distribution of benefits. Proposals for action are discussed under sub-parts 2.1 and 2.2 above.

2.4 Impacts of IPR Systems on Transfer of or Access to Technology

55. Another set of arguments is concerned with whether IPR create incentives for the diffusion or transfer — as distinct from innovation — of technology, including biotechnology that uses genetic resources, particularly to developing countries. These issues also arise with respect to the transfer of and access to technology relevant for the conservation and sustainable use of the components of biological diversity. Such technology could include, for example, geographic information systems useful for inventorying and mapping biological diversity concentrations and associated biological resources, or more selective gear for harvesting marine living resources that reduce the level of bycatch or damage to ecosystems.

56. While there is widespread agreement that IPR in some form are necessary to stimulate innovation, there is less agreement regarding the impact of IPR on the diffusion of technology. In the area of plant genetic resources, for example, the seed industry in developed countries has successfull sought to expand IPR protection, such as PBRs and more recently utility patents, over lite" crop varieties. There are concerns that the result is a worsening disparity between rewards flowing to seed companies in industrialised countries and rewards flowing to countries and farming communities providing genetic resources. For the latter, it is argued, proprietary varieties may be prohibitivel expensive; in addition, there is no formal mechanism analogous to IPR to ensure that they share in the benefits from the use of their resources in the development of elite varieties. Moreover, there are concerns that the expanding scope and use of IPR) in particular utility patents on plant varieties — may

discourage researchers fro exchanging resources freely (Plowman 1993). More generally, there are concerns that strengthened IPR in at least some developing countries may open doors to imports of IPR-protected goods without stimulating foreign direct investment in productive facilities (e.g., Correa 1993).

57. On the other hand, some commentators argue that IPR encourage technology transfer and foreign direct investment in sectors like pharmaceuticals or chemicals, where research and development costs are high and products are easily copied, by reassuring owners of proprietary technology that their rights will be protected (Mansfield 1994, UNEP/CBD/COP/3/Inf.10). However, it has been argued that IPR in other sectors in fact play a relatively small role in determining whether technology is accessible (UNEP/CBD/COP/3/Inf.10). Often, access to information about technologies, financial resources and technological capacity are more important determinants of whether a country or firm within a countr can acquire a given technology (UNEP/CBD/COP/3/Inf.10). In industries where IPR are considered important, it is argued that potential suppliers of technologies are more willing to transfer technolog voluntarily if the host country has an effective IPR regime in place (Ibid.).

58. As a whole, the empirical evidence on these issues appears to be inconclusive (Blakeney 1989; Siebeck, ed. 1990). Recently, the conflict around IPR and technology transfer appears to have abated somewhat, perhaps because the TRIPs Agreement has articulated somewhat more detailed IPR standards for its 120-plus members than previously existed at the international level. Discussion appears to focus increasingly on the impacts of IPR on the transfer of or access to specific types of technologies. This is consistent with the second meeting of the SBSTTA recommendation to the COP that t]he work of the SBSTTA on access to and transfer of technology should now adopt an integrated approach. It should be conducted within sectoral themes related to the priority issues under the programme of work of the SBSTTA, for example technologies relevant to the conservation and sustainable use of, or making use of, marine biological diversity or agricultural biological diversity" (UNEP/CBD/COP/3/3, Recommendation II/3).

2.5 Relationships Between IPR Systems and the Clearing-House Mechanis

59. Intellectual property rights systems are likely to have significant implications for the clearing-house mechanism for scientific and technical cooperation (CHM) established under the Convention pursuant to Article 18(3). The IPR framework for collections of data, especially in digital electronic formats, is evolving rapidly, although perhaps not as rapidly as are the technologies for computerised data organisation and electronic data communications. It is becoming increasingly easy to collect, process, organise, transmit and distribute data in electronic form. These trends are likely to affect IPR regimes, including relevant international law such as the TRIPs Agreement and the intellectual property agreements administered by the World Intellectual Property Organization, including the Berne Convention for the Protection of Literary and Artistic Work. (UNEP 1995:662-65).[12]

60. Several competing principles will bear on these developments. They include the ublic interest in encouraging the broadest possible access to information on biological diversity", which encourages the treatment of databases as ublic goods" (Ibid.) This approach reflects a long-standing tradition in

the scientific communit , and is also reflected in provisions of environmental agreements, including the Convention on Biological Diversity, calling for international exchange of scientific and technical information (see, e.g., Article 17 of the Convention on Biological Diversity). In contrast, the private sector often seeks to restrict the sharing of information to protect economic interests, while government agencies sometimes do the same on grounds of national-security interests. Those seeking to restrict information flows may resort in some cases to the use of IPR, at least for the purpose of conditioning access on payment. There may also be conservation reasons for withholding information; for example when public disclosure of the location of a population of an endangered species would put the species' survival further at risk.

61. Much if not most of the information that will likely be offered (through links or database storage) for the CHM will have been collected by scientists in the public sector. This raises the issue of how IPR are to be allocated if information is obtained from the CHM and then used for economic gain, perhaps as an input into an IPR-protected product or process. Should users be obliged to sign an agreement to share any profits with information providers? Or perhaps to sign an agreement not to assert proprietary rights over information from the CHM or over products developed using that information? Or is a signed agreement the wrong approach altogether?

62. Another issue involves the need to protect the interests of indigenous and local communities if their knowledge, innovations and practices are to be made available through the CHM. At its second meeting, the SBSTTA recommended that the COP should "r]ecognize that ownership and control of all information remain [sic] with the providers, respecting the rights of countries of origin and of indigenous and local communities" (UNEP/CBD/COP/3/3, Recommendation II/6). The relationship of this language to the relevant provisions of the Convention, such as Articles 8(j) and 16(5), leaves a number of questions unanswered.

3. OPTIONS FOR FUTURE WORK UNDER THE CONVENTION

63. The complex debate on IPR systems and their relationship with the Convention objectives has often been hampered by a lack of specific factual grounding. For example, there has been little empirical study of the impact of specific types of IPR on specific bodies of traditional knowledge. The following options identify areas where the COP might wish to proceed by initiating processes for studying the status and impacts of existing IPR systems or by studying the possibility of changing or adding to the existing IPR framework. Such specific initiatives could help move the debate beyond general discussions of IPR.

64. The COP may wish to consider:

(a) **Encouraging Case Studies of IPR Impacts.** The COP might wish to call on governments, intergovernmental organisations and other organisations in the field of conservation and sustainable use to conduct and bring to the Secretariat attention studies of IPR impacts on the Convention objectives, for wider distribution through the clearing-house mechanism (CHM). Such studies would focus on specific cases in which genetic resources, associated traditional knowledge and/or biological resources have been used outside of the

country of origin. The studies might analyse the relationship between IPR impacts and the principles articulated in Articles 8(j), 15 and 16.

(b) **Encouraging Continued Study on Patent Application Disclosure Policy.** The COP might wish to encourage continued and expanded study by Parties and interested organisations of the extent to which the Convention objectives might be furthered through a practice requiring patent applicants to disclose information regarding the origin of biological materials and the traditional knowledge or practices of indigenous and local communities used in the development of the invention, possibly also disclosing measures taken to gain approval for such use and to share benefits. The study could consider the implications of formalising such a procedure, including the practicalities of defining terms, and the feasibility of incorporating such requirements into patent examinations.

(c) **Exploring Options for Accommodating Traditional Knowledge Within Existing IPR Regimes.** The COP might wish to call for study of the potential for existing IPR regimes to accommodate and protect traditional knowledge so as to promote the implementation of Article 8(j) and the achievement of the Convention objectives.

(d) **Reviewing the Relationship Between Appellations of Origin or Trademarks and Traditional Knowledge and Practices.** The COP might wish to consider calling on governments and relevant organisations to conduct a study of the potential for existing systems of appellations of origin or trademarks to ensure indigenous and local communities' prior approval of wider use of their traditional knowledge and practices and to encourage sharing of benefits from such use. The study could also review options for modifying or augmenting such systems in order to enhance the opportunities for prior approval and benefit sharing.

(e) **Managing Information Relating to the Clearing House Mechanism (CHM).** The COP might request that the Secretariat carry out a study, as part of the pilot phase of the CHM, exploring practical options for implementing SBSTTA II Recommendation II/6, para. 4, that the COP should r]ecognize that ownership and control of all information [made available through the CHM should] remain with the providers, respecting the rights of countries of origin and of indigenous and local communities". In particular, the Secretariat might explore options for how the CHM might model approaches for acknowledging or sharing the benefits of indigenous and local communities' knowledge, innovations and practices, and for assuring prior approval for the dissemination or use of such knowledge, innovations or practices.

(f) **Encouraging Parties to Convene Stakeholder Consultations.** The COP might wish to consider calling on governments and IGOs to carry out consultations with stakeholders, which could focus on the impacts of specific types of IPR on specific bodies of traditional knowledge, or on the sharing of specific experiences of IPR impacts on particular communities. Stakeholders could include indigenous and local communities, industry, and public -sector researchers.

(g) **Request the Involvement of Relevant IGOs.** For each of these options, the COP might

wish to encourage or request involvement of relevant IGOs, in particular the World Intellectual Property Organization and the World Trade Organizationl, as well as relevant NGOs, including academic institutions and professional associations, as appropriate.

(h) **Distribute Results Through the Secretariat and the CHM.** For each of the options above, Parties and other actors could report outcomes and results to the Secretariat, for wider distribution through the CHM.

REFERENCES

Balick, M. 1994. "Ethnobotany, drug development and biodiversity conservation: exploring the linkages". In *Ethnobotany and the Search for New Drugs.* New York: John Wiley and Sons. Ciba Foundation Symposium 185.

Bellagio Conference. 1993. Statement of the Bellagio Conference: Cultural Agency/Cultural Authority: Politics and poetics of intellectual property in the post-colonial era. n.d.: n.p.

Brard, L. and Marchenay, P. 1996. "Tradition, Regulation, and Intellectual Property: Local Agricultural Products and Foodstuffs in France". Pages 230-43 in S. B. Brush and D. Stabinsky. *Valuing Local Knowledge: Indigenous People and Intellectual Property Rights.* Washington, D.C.: Island Press.

Berkes, F., Folke, C. and Gadgil, M. 1995. "Traditional Ecological Knowledge, Biodiversity, Resilience and Sustainability". In Perrings, C.A., et al. *Biodiversity Conservation: Problems and Policies.* Dordrecht, Netherlands: Kluwer Academic Publishers. Ecology, Economy and Environment 4.

Blakeney, M. 1989. *Legal Aspects of the Transfer of Technology to Developing Countries.* Oxford: ESC Pub.

Brush, S.B. and Stabinsky, D. *Valuing Local Knowledge: Indigenous People and Intellectual Property Rights.* Washington, D.C.: Island Press.

Butler, L.J. and Marion, B., 1985. "The Impacts of Patent Protection on the U.S. Seed Industry". North Central Region Department of Agriculture Research Publication 304.

Butler, L.J. 1996. "Plant Breeders' Rights in the U.S.: Update of a 1983 study". In van Wijk, J. and Jaffe, W. eds. *Intellectual Property Rights and Agriculture in Developing Countries.* Amsterdam: University of Amsterdam.

COICA (Coordinating Body for the Indigenous Peoples' Organizations of the Amazon Basin). 1994. *Regional meeting sponsored by COICA and UNDP on "Intellectual Property Rights and Biodiversity" [Statement]*. Santa Cruz de la Sierra, Bolivia. n.p.

Correa, C. M. 1993. *Intellectual Property Rights and Foreign Direct Investment.* New York: United Nations. Doc. No. ECOSOC ST/CTC/SER.A/24.

Cox, P. 1994. "The ethnobotanical approach to drug discovery: strengths and limitations". In *Ethnobotany and the Search for New Drugs.* New York: John Wiley and Sons. Ciba Foundation Symposium 185.

The Crucible Group. 1994. *People, Plants and Patents: the impact of intellectual property on biodiversity, conservation, trade and rural society.* Ottawa, Ontario, Canada: International Development Research Centre.

Downes, D. R. 1993. "New Diplomacy for the Biodiversity Trade: Biodiversity, biotechnology and intellectual property in the Convention on Biological Diversity". *Touro Journal of Transnational Law* 4:1-46.

Downes, D. R. 1996. "Global Trade, Local Economies and the Biodiversity Convention". In Snape, W.J., ed. *Biodiversity and the Law.* Washington, D.C.: Island Press.

Evenson, R. 1995. *The Valuation of Crop Genetic Resource Preservation, Conservation and Use.* Paper prepared for the Commission on Plant Genetic Resources, FAO, Rome.

Farnsworth, N.R. 1994. "Ethnopharmacology and drug development". In *Ethnobotany and the Search for New Drugs.* New York: John Wiley and Sons. Ciba Foundation Symposium 185.

Four Directions Council. 1996. Forest Indigenous Peoples and Biodiversity.

Gadgil, M. and Devasia, P. 1995. "Intellectual Property Rights and Biological Resources: Specifying Geographical Origins and Prior Knowledge of Uses". *Current Science* 69(8).

Gupta, A. 1992. *Debate on Biotechnology and Intellectual Property Rights: Protecting the Interests of Third World Farmers and Scientists.* Ahmedabad, Gujarat, India: Indian Institute of Management. W. P. No. 1057.

Huffman,W. and Evenson, R. 1993. *Science for Agriculture*, Iowa State University Press:Ames.

International Alliance of Indigenous-Tribal Peoples of the Tropical Forests. [1996?] *The Biodiversity Convention: The concerns of indigenous peoples.* London: International Alliance of Indigenous-Tribal Peoples of the Tropical Forests. Draft.

Jaffe, W. and van Wijk, J. 1995. *The Impact of Plant Breeders' Rights in Developing Countries*, Technical Paper of the Special Programme on Biotechnology and Development Cooperation, Ministr of Foreign Affairs: The Hague.

Keystone Center. 1991. *Final Consensus Report: Global Initiative for the Security and Sustainable*

Use of Plant Genetic Resources. Keystone, Colo., USA: Keystone Center. (Oslo Plenary Session, Keystone International Dialogue Series on Plant Genetic Resources.)

King, S.R. 1996. "Conservation and Tropical Medicinal Plant Research". In Balick, M.J., E. Elisabetsky, and S.A. Laird (eds). 1996. *Medicinal Resources of the Tropical Forest: Biodiversity and its Importance to Human Health.* New York: Columbia University Press.

Kloppenburg, J. 1988. *First the Seed: the political economy of plant biotechnology: 1492-2000.* New York: Cambridge University Press.

Levin, et al. 1988. *Appropriating the Returns from Industrial Research and Development.* Washington, D.C.: Brookings Institution. Brookings Papers on Economic Activity 3:783.

Mansfield, E. 1993. *Intellectual Property Protection, Foreign Direct Investment and Technology Transfer.* Washington, D.C.: World Bank.

Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples. 1993. Geneva: Commission on Human Rights, Sub-Commission on Prevention of Discrimination and Protection of Minorities. Working Group on Indigenous Populations. Doc. No. E/CN.4/Sub.2/AC.4/1993/CRP.5.

Mays, T. et al. 1996. "*uid Pro Quo:* Alternatives for Equity and Conservation". Pages 259-280 in S. B. Brush and D. Stabinsky. *Valuing Local Knowledge: Indigenous People and Intellectual Property Rights.* Washington, D.C.: Island Press.

Perrin, R., Kunnings, K. and Ihnen, L., 1983. *Some Effects of the US Plant Variety Protection Act of 1970.* Economic Research Report No. 46, Department of Economics, North Carolina State University.

Pinel, S.L. and Evans, M.J. 1994. "ribal Sovereignty and the Control of Knowledge". In T. Greaves, ed. *Intellectual Property Rights for Indigenous Peoples: A Source Book.* Oklahoma City, OK, USA: Society for Applied Anthropology.

Plowman, R.D. 1993. "ntellectual Property Rights in Plants: An ARS Perspective". *Diversity* 9(1&2): 74-75.

Posey, D. and Dutfield, G. 1996. *Beyond Intellectual Property: Toward traditional resource rights for indigenous peoples and local communities*. Ottawa, Canada: IDRC.

Pray and Knudsen, 1994. "mpact of Intellectual Property Rights on Genetic Diversity: The Case of Wheat". *Contemporary Economic Policy* 12:102.

Sedjo, R. A. 1989. "roperty Rights for Plants". *Resources* (97):1.

Siebeck, W.E., ed. 1990. *Strengthening Protection of Intellectual Property in Developing Countries: A Survey of the Literature.* Washington DC.: World Bank. World Bank Discussion Papers, No. 112.

Stallman, J. I. and Schmid, A. A. 1987. "roperty Rights in Plants: Implications for Biotechnolog Research and Extension". *American Journal of Agricultural Economics* 69(2) 423-37.

Sukhwani, A. [1996]. *Intellectual Property and Biological Diversity: Issues Related to Country of Origin.* Paper prepared for the Secretariat of the Convention on Biological Diversity. n.p.

Swanson,T., Pearce, D. and Cervigni,R. 1994. *The Appropriation of the Benefits of Plant Genetic Resources for Agriculture.* Rome: FAO, Commission on Plant Genetic Resources.

Swanson,T. 1995. *Intellectual Property Rights and Biodiversity Conservation*, Cambridge University Press: Cambridge.

_____. 1996a. "iodiversity as Information". *Ecological Economics* 17:1-8.

_____. 1996b. *Impact of IPR systems on the conservation and sustainable use of biological diversity, and on the equitable sharing of benefits from its use.* (Included as UNEP/CBD/COP/3/Inf.13).

United Nations Environment Programme. 1995. *Global Biodiversity Assessment.* Cambridge, U.K.: Cambridge Universitiy Press. (V.H. Heywood, exec. ed. R.T. Watson, chair.)

Vogel, J. H. 1994. *Genes for sale : privatization as a conservation policy.* New York : Oxford University Press.

WIPO (World Intellectual Property Organization). 1985. *Model Provisions for National Laws on the Protection of Expressions of Folklore Againlst Illicit Exploitation and Other Prejudicial Actions.* Geneva: WIPO/UNESCO.

_____. 1990. *Basic Notions of Industrial Property and Licensing: Document prepared by the International Bureau (for the UNEP Expert Group on proprietary rights and licensing).* Doc. No. WO/INF/51. Geneva: WIPO.

WCMC (World Conservation Monitoring Centre). 1992. *Global Biodiversity*. London: Hall
World Conservation Monitoring Centre and Faculty of Economics, Cambridge University (1996). *Industrial Reliance Upon Biodiversity*, WCMC: Cambridge.

WTO (World Trade Organization). Committee on Trade and Environment. 1995. *Report of the Meeting Held on 21-22 June 1995: Note by the Secretariat.* Geneva: WTO. Doc. No. WT/CTE/M/3.

NOTES

[1] As of the date of preparation of this paper, the Secretariat had received no case studies fro governments or other relevant stakeholders; however, the Secretariat has taken into account comments relating to IPR submitted by Governments in response to a request for information on other agenda items such as ways to promote access to and transfer of technology.

[2] Article 16 as a whole concerns the access to and transfer of technology among Parties, recognizing that they are "essential elements for the attainment of the objectives of [the] Convention". Paragraph 1 provides that each Party shall "provide and/or facilitate access for and transfer to other Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment". The remainder of the Article qualifies or elaborates upon this general obligation; for example, by putting an emphasis on providing technology for developing country Parties and Parties that are countries of origin for genetic resources. Particularly relevant for the purposes of this discussion is paragraph 2, which states that "technology subject to patents and other intellectual property rights shall be provided on terms which recognize and are consistent with the adequate and effective protection of IPR".

[3] Additional discussion of the basic elements of IPR systems can be found in *Intellectual Property Rights,* (UNEP/CBD/COP/2/17), paragraphs 9-22.

[4] There is, however, some concern that some recent patents in the biotechnology field may violate this principle. *See* paragraph 33, below.

[5] It should be noted that while IPR restrict commercial use of protected information, they can also promote broader dissemination of information to the benefit of society. For example, an applicant for a patent must disclose in the application information sufficient to allow another person skilled in the relevant field to reproduce the invention. Relinquishing control over this information is part of what the inventor gives to society in exchange for exclusive control over the reproduction (for a utility patent) or the use (for a process patent) of the invention. Dissemination of this information supports further research and development in the relevant field.

[6] For additional information regarding the TRIPs Agreement and its relationship to the Convention on Biological Diversity, see the background paper for Agenda Item 14.2 entitled *Synergies and Relationships Between the Objectives of the Convention on Biological Diversity and the TRIPs Agreement,* UNEP/CBD/COP/3/23.

[7] There are a number of other issues relating to IPR that have raised significant concerns, but are not within the realm of issues identified by the COP and are thus outside the scope of this paper. The include the socio-economic impacts of patenting pharmaceuticals and other products important for public health and welfare, and the moral implications of animal and plant patenting. Likewise, the paper does not discuss issues relating to patenting of human genes, since COP II "r]eaffirm[ed] that human genetic resources are not included within the framework of the Convention". *See* Decision II/11,

UNEP/CBD/COP/2/19, Annex II.

[8] Note, however, that the expansive patent claims referenced in the preceding paragraph have raised questions for some about whether this principle will be consistently applied to biotechnological inventions.

[9] Further discussion of the value of these resources can be found in *Economic Valuation of Biodiversity: Note by the Secretariat,* prepared for the second meeting of the Subsidiary Body on Scientific, Technical, and Technological Advice (UNEP/CBD/SBSTTA/2/13). Additional information on the value of these resources may be found in *Farmers' Rights and Rights of Similar Groups,* UNEP/CBD/IC/2/14, paras. 7-10; and *Knowledge, Innovations and Practices of Indigenous and Local Communities,* UNEP/CBD/SBSTTA/2/7, paras. 74-82.

[10] See also *The Convention on Biological Diversity and the TRIPs Agreement: Relationships and Synergies*, UNEP/CBD/COP/3/23.

[11] An example of this approach may be found in the implementation of Article 15 by the Philippines. Under the Philippines law, foreign institutions must agree, as a condition of access to genetic resources, to permit use within the Philippines of any invention developed using the genetic resources. *See* UNEP/CBD/COP/3/20. See also *The Convention on Biological Diversity and the TRIPs Agreement: Relationships and Synergies*, UNEP/CBD/COP/3/23.

[12] This assertion, subsequent quotations in this section and the following discussion generally are drawn from UNEP 1995:662-65. See also *The Convention on Biological Diversity and the TRIPs Agreement: Relationships and Synergies*, UNEP/CBD/COP/3/23.

- - - - -