

# Intellectual property rights and traditional knowledge biopiracy or bioprospecting?

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## Intellectual Property Rights and Traditional Knowledge: Biopiracy or Bioprospecting ?

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## **Abstract**

“Biopiracy” is a term used to describe the unauthorized use of traditional communities’ knowledge of biological resources. Often, biopiracy is also associated with an unequal share of benefits between a patent holder and the indigenous community whose resource and/or knowledge has been used: the latter may not even benefit at all. Bioprospecting, on the other hand, is a term used by proponents of the commercialization of appropriated biological samples, emphasizing the mutual benefit that results from such transactions. Two international treaties, the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement and the Convention on Biological Diversity (CBD), are employed to address the legal aspects of such prospecting agreements. However, the CBD and the TRIPS agreement have generated considerable friction and uncertainty regarding how to interpret such international contracts. This is no surprise, since the two treaties were created with different goals. The CBD’s focus is to protect biological diversity as “a common concern of humankind,” whereas TRIPS promotes private ownership and exploitation of such resources through patents and other means. Harmonization of the two treaties has been slow, and other solutions relating to a more equitable sharing of biological resources have been proposed.

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Michael J. B. Krieger

“Biopiracy” is a term used to describe the unauthorized use of traditional communities' knowledge of biological resources. Often, biopiracy is also associated with an unequal share of benefits between a patent holder and the indigenous community whose resource and/or knowledge has been used: the latter may not even benefit at all. Bioprospecting, on the other hand, is a term used by proponents of the commercialization of appropriated biological samples, emphasizing the mutual benefit that results from such transactions. Two international treaties, the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement and the Convention on Biological Diversity (CBD), are employed to address the legal aspects of such prospecting agreements. However, the CBD and the TRIPS agreement have generated considerable friction and uncertainty regarding how to interpret such international contracts. This is no surprise, since the two treaties were created with different goals. The CBD's focus is to protect biological diversity as "a common concern of humankind," whereas TRIPS promotes private ownership and exploitation of such resources through patents and other means. Harmonization of the two treaties has been slow, and other solutions relating to a more equitable sharing of biological resources have been proposed.

## 1. Introduction

The Hagahai tribe is considered to be one of the ancestors of the present day Papuan-speaking people. Having reached the islands about 35,000 years ago,<sup>1</sup> the Hagahai people lived as hunter-gatherers in the mountains of New Guinea, unknown to the outside world. However, around 1983 they ventured from their mountain sanctuary to seek help from outsiders to combat the increase in infant deaths from malaria.<sup>2</sup> A medical anthropologist at the Papua New Guinea Institute of Medical Research responded to their call, which led eventually to the study of this isolated people. The study involved collecting blood samples from a number of members of the tribe that were sent to the US National Institute of Health (NIH) for further analysis. To the researchers' surprise, some of the Hagahais carried a type of human T-cell leukemia virus that usually causes a severe form of leukemia. Interestingly, the isolated form seemed to be benign, and the researchers hoped to find a new leukemia treatment or at least a better diagnostic test for other viruses in this family. They established a self-perpetuating culture of virus-infected white blood cells and applied for a US patent.<sup>3</sup> In March 1995, US Patent 5,397,696 with the title "Papua New Guinea human T-lymphotropic virus" was granted. The invention was defined as relating "to a human T-cell line (PNG-1) persistently infected with a Papua New Guinea (PNG) HTLV-I variant and to the infecting virus." The patent listed the medical anthropologist and four other U.S. government researchers as "inventors" and the U.S. Department of Health and Human Services as "assignee." The tribesmen who gave the blood samples were not named or listed as beneficiaries.

The possibility that a government 26,000 kilometers away could claim rights over parts of a New Guinean tribesman led to a public outcry.<sup>4</sup> Even though the scientists who filed the Hagahai patent claimed to have "negotiated a profit-sharing agreement with the Hagahai, and asserted that they will devote any royalties to benefiting the Hagahai,"<sup>5</sup> the necessary steps to obtain prior informed consent for the research that led ultimately to the grant of the U.S. patent on a human T-cell line were never taken. This public controversy, including summoning the U.S. ambassador

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<sup>1</sup> M. Dunn, A. Terrill, G. Reesink, R. A. Foley, S. C. Levinson (2005) Structural Phylogenetics and the Reconstruction of Ancient Language History, *Science* 309: 2072.

<sup>2</sup> P. A. Lacy (1998) Gene Patenting: Universal Heritage vs. Reward for Human Effort, *77 Or. L. Rev.* 783: 794.

<sup>3</sup> U.S. Patent No. 5,397,696 (filed Aug. 12, 1991).

<sup>4</sup> First publicized by Canada-based Indigenous Peoples' Biodiversity Network (IPBN).

<sup>5</sup> *Supra* note 2.

for a full explanation before the government of New Guinea,<sup>6</sup> led the NIH in October of 1996 to disclaim the patent at the U.S. Patent and Trademark Office (USPTO).<sup>7</sup> The disclaimer forfeited all of the U.S. Government's "past and future rights in each and every claim of United States Patent No. 5,397,696 thereby relinquishing all control over said patent."

These and other cases relating to intellectual property rights (IPRs) and the appropriation of biological samples have garnered much debate over the past three decades. Do corporations and governments of developed nations have the right to own biological samples or components of the traditional knowledge of people in developing nations? This phenomenon, depending on the parties' respective standpoint, has been referred to as biopiracy or as bioprospecting. According to WordNet, a lexical database maintained by Princeton University, biopiracy is "biological theft or illegal collection of indigenous plants by corporations who patent them for their own use."<sup>8</sup> Other sources use a wider definition and include the "unequal share of benefits between a patent holder and the indigenous community whose resource and/or knowledge has been used."<sup>9</sup> Bioprospecting,<sup>10</sup> on the other hand, is a term used by proponents of commercialization of appropriated biological samples, including knowledge of traditional medicine. In theory, bioprospecting should be a fair undertaking based on certain legal conditions, such as informed consent and benefit sharing.

The rules of conduct regarding the use and appropriation of traditional knowledge were established during the 1992 Convention on Biological Diversity (CBD) to protect indigenous bio-knowledge. However, as many case studies show, the rules of fair conduct laid down in these statutes are rarely respected. Moreover, these rules conflict with other international IPR treaties, making their enforcement difficult. Various international institutions, such as the Food and Agriculture Organization (FAO),<sup>11</sup> the World Intellectual Property Organization (WIPO),<sup>12</sup> and the United Nations Educational, Scientific and Cultural Organization (UNESCO),<sup>13</sup> are involved

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<sup>6</sup> <http://www.chicagotribune.com/news/local/chi-060826salopekgene2-story,1,894809.story?page=1> (last accessed March 25, 2008).

<sup>7</sup> <http://144.16.65.194/hpg/envis/doc97html/biod6ipr512.html> (last accessed March 25, 2008).

<sup>8</sup> <http://wordnet.princeton.edu/perl/webwn?s=biopiracy> (last accessed March 25, 2008).

<sup>9</sup> <http://en.wikipedia.org/wiki/Biopiracy> (last accessed March 30, 2008).

<sup>10</sup> Bioprospecting of Genetic Resources in the Deep Seabed: Scientific, Legal and Policy Aspects.

<sup>11</sup> <http://www.fao.org/DOCREP/ARTICLE/WFC/XII/0911-A3.HTM> (last accessed March 30, 2008).

<sup>12</sup> [http://www.wipo.int/edocs/mdocs/tk/en/wipo\\_grtkf\\_ic\\_11/wipo\\_grtkf\\_ic\\_11\\_11.pdf](http://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_11/wipo_grtkf_ic_11_11.pdf) (last accessed March 30, 2008).

<sup>13</sup> <http://www.unesco.org/most/bpikpub.htm#ikbestpractices> (last accessed March 30, 2008).

in the formulation of guidelines and treaties on this matter. The two most important international treaties regulating behavior in this field are the above-mentioned CBD and the agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). The following section will focus on the relationship between these two most important treaties.

## 2. CBD and TRIPS agreement

### 2.1. Convention on Biological Diversity (CBD)

The CBD is an international treaty which was adopted in Rio de Janeiro in June 1992. Its goal is to preserve, but at the same time to harness the world's biological resources in a sustainable manner. It came into force in 1993. Almost all nations signed the convention with the exception of Andorra, Iraq, Somalia, the Vatican, and the United States of America.<sup>14</sup>

Article 1 of the Convention sets out the overall objectives, the “conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.” The “fair and equitable sharing” is further defined as including the back-licensing of relevant technologies developed by the proprietor on condition that the IPRs are respected and proper license fees are paid.<sup>15</sup> All states have “the sovereign right to exploit their own resources pursuant to their own environmental policies,”<sup>16</sup> but only if they ensure that such activities do not cause damage to the environment. Furthermore, the state is required to “respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles ... and promote their wider application with the approval and involvement of the holders of such knowledge.”<sup>17</sup> In other words, the state is obliged to foster traditional knowledge, and at the same time needs to obtain approval from and involve the holders of the traditional knowledge. Exploitation of knowledge

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<sup>14</sup> <http://www.cbd.int/convention/parties/list.shtml> (last accessed March 25, 2008).

<sup>15</sup> Article 1. Objectives: The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

<sup>16</sup> Article 3. Principle: States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

<sup>17</sup> Article 8. In-situ Conservation: (j) Subject to its national legislation, respect, 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;

without consent of the right holders is prohibited. Article 15 regulates access to genetic resources. Paragraph 1 gives each state the sovereign right over its natural resources.<sup>18</sup> However, access can be granted to others “on mutually agreed terms” (Para. 4),<sup>19</sup> but only if the party providing these resources consented before any such exchanges took place (Para. 5).<sup>20</sup> Finally Article 16 discusses access to and transfer of technology in more detail. Paragraph 1 states that “both access to and transfer of technology among Contracting Parties are essential elements for the attainment of the objectives of this Convention.” Paragraph 5 states that patents and other intellectual property rights are to be respected, unless they - and this is a crucial point - “do not run counter to [the convention’s] objectives.”<sup>21</sup> In other words, it is possible, at least in theory, to violate IPRs if for example the conservation of biological diversity were to be threatened.

## **2.2. The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)**

The TRIPS agreement, administered by the World Trade Organization (WTO), sets down minimum standards for most forms of intellectual property (IP) regulation. It was negotiated as part of the so-called Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994. Its inclusion in the GATT treaty was due to the lobbying of the developed nations, against strong opposition from developing nations. This agreement was far-reaching for two reasons. First, it introduced intellectual property law for the first time into the international trading system; secondly, ratification of TRIPS is a compulsory requirement of WTO membership. In other words, any country that wants to benefit from easy access to international markets, and hence enjoy the most favored nation rule<sup>22</sup> and the national treatment policy,<sup>23</sup> must legislate on intellectual property as mandated by the TRIPS agreement.

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<sup>18</sup> Article 15. Access to Genetic Resources: (1) Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.

<sup>19</sup> Article 15. Access to Genetic Resources: (4) Access, where granted, shall be on mutually agreed terms and subject to the provisions of this Article.

<sup>20</sup> Article 15. Access to Genetic Resources: (5) Access to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party.

<sup>21</sup> Article 16. Access to and Transfer of technology: (5) The Contracting Parties, recognizing that patents and other intellectual property 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.

<sup>22</sup> Members have to grant the same trading conditions to all other WTO members. B. Hoekman (2002). *The WTO: Functions and Basic Principles. Development Trade, and the WTO, A handbook, Part-I-IV*, The World Bank, Washington D.C.

<sup>23</sup> Imported and locally-produced merchandise must be treated equally. B. Hoekman (2002). *The WTO: Functions and Basic Principles. Development Trade, and the WTO, A handbook, Part-I-IV*, The World Bank, Washington D.C.



### **2.3. Relationship between CBD and the TRIPS agreement**

One could argue that the relationship between TRIPS and the CBD is one of opposing principles, since TRIPS aims to protect private property, whether owned by individuals or by multinational companies, while the CBD's aim is to strengthen developing countries' capacity to conserve their biological diversity and at the same time secure rights over those resources. Both agreements deal with economic aspects of IP, but only the CBD includes provisions to conserve biological diversity. As such, the CBD aims to tackle important aspects of today's global environmental problems (e.g. conservation of biological diversity, the sustainable use of its components) while addressing the fair and equitable sharing of benefits that might arise through the use of such biological resources. In contrast, the TRIPS agreement does not include any responsibilities regarding the conservation of biological resources or those who will benefit from ownership rights over these resources.

A substantial conflict between the two agreements arises where both contain similar subject matter, yet differ in their provisions. According to TRIPS, IPRs are private rights that must conform to the general principles of the WTO (e.g. national treatment). For example, the implementation of TRIPS Article 27.3(b), on protection of plants, may inadvertently give rise to private property rights with global jurisdiction. There is no provision that guarantees any protection to the holders of traditional knowledge. Private entities may obtain permission from the respective governments, but there is no guarantee that the benefit will reach the indigenous communities, the holders of traditional knowledge. Even though Article 7 includes "the promotion of technological innovation and ... the transfer and dissemination of technology to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare," it does not explain how this "dissemination of technology ... in a manner conducive to social ...welfare" should be achieved. This is in stark contrast with the CBD convention where knowledge or biological resources are only to be transferred with the prior informed consent of the holder of knowledge. Another difference between the two agreements is ownership of the knowledge. The CBD gives each state the sovereign right to exploit its own resources. In other words, traditional knowledge and biological material belong initially to the state and to its indigenous communities. This contradicts TRIPS's notion of IPRs as private property rights and may lead to a direct conflict, especially where the IPR holder is a foreign entity.

## 2.4. Criticism of the TRIPS agreement

Developing countries have criticized the TRIPS agreement, because most of the IP assets are held by developed nations that thereby profit from developing countries. Yet a significant number of IP assets are derived from the rich biological diversity of developing countries, often appropriated without proper compensation. Industrialized countries justify harmonizing IPRs on a global scale on the grounds that such rights will strengthen innovation. Even though most innovation takes place in industrial nations, the proponents of TRIPS argue that the profits made by these companies will eventually “trickle down” to developing nations, either through favorable technology transfer agreements or by developing new medicines that will benefit the populations of such nations.

The TRIPS agreement does contain some provisions regarding technology transfer to least-developed countries; however, it does not seem to benefit developing countries. Article 66(2) states that “[d]eveloped country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base.” However, the provision does not specify whether the “incentives to enterprises and institutions” are to be passed down to developing nations. In any event, the motivation for this provision does not seem to be humanitarian in nature, as developed countries have a strong interest in creating a need, and selling the “technological base” to developing nations. Article 67 on Technical Cooperation goes on to talk about “technical and financial cooperation in favor of developing and least-developed country Members.” However, this “technical and financial cooperation” is defined as “assistance in the preparation of laws and regulations on the protection and enforcement of intellectual property rights as well as on the prevention of their abuse...”. In other words the “technical and financial cooperation” is geared towards making sure that IPRs are enforced to the highest standards in developing nations, and has little to do with benefit sharing.

Whether the profits made by the large international corporations will eventually “trickle down” to developing nations remains an open question. Not surprisingly, empirical research is inconclusive,<sup>24,25</sup> given the complexity of relations between industrialized and developing countries. However, in the field of pharmaceutical products, where genetic resources are

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<sup>24</sup> H. W. Arndt (1983) The “Trickle-down” Myth, *Econ. Dev. Cult. Change* 32: 1.

<sup>25</sup> D. Dollar, and A. Kraay (2004) Growth is good for the poor (In: *Growth, Inequality and Poverty*, eds. Anthony Shorrocks and Rolph van der Hoeven). London: Oxford University Press.

becoming more and more important, approximately ten corporations, all located in industrialized nations, hold 65% of the pharmaceutical market,<sup>26</sup> 84% of the agrochemical market,<sup>27</sup> and 64% of the proprietary seed market.<sup>28</sup> Even though one cannot conclude from these facts that there is no “trickle down” effect, such a dominant market position of companies exclusively located in industrial nations certainly does not support it either. Furthermore, such a market dominance can easily give rise to abuse, such as unjustified price hikes or restrictive licensing conditions, thus eliminating competing products and ultimately hindering the diffusion of technology.<sup>29</sup>

### 3. Case Studies

Many cases of biopiracy have been reported worldwide, such as the Rosy Periwinkle, the Neem Tree,<sup>30</sup> the Enola Bean,<sup>31</sup> the Hoodia cactus,<sup>32</sup> Turmeric,<sup>33</sup> and many others. Although the cases relate to different biological specimens, the underlying stories are quite similar. Usually a corporation or a governmental organization acquires IPRs on a biological specimen without obtaining the consent of or paying appropriate compensation to the original knowledge holders. In the following section, two representative cases are outlined.

#### 3.1. The Rosy Periwinkle (Madagascar)

The Rosy Periwinkle is an evergreen shrub species native and endemic to Madagascar. The plant contains very important cancer-fighting agents: Vinblastine and Vincristine.<sup>34</sup> Vinblastine has helped to increase the chance of surviving childhood leukemia from 10% to 95%, while Vincristine is used to treat Hodgkins' Disease. Before its cancer-fighting properties were discovered, Rosy Periwinkle was traditionally used as a treatment against diabetes. Its traditional use aroused the interest of Western scientists and led eventually to the discovery of its anti-cancer properties. In 1954 technicians from the American firm Eli Lilly extracted two alkaloids,

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<sup>26</sup> <http://www.mindfully.org/WTO/Concentration-Corporate-Power.htm> (last accessed March 25, 2008).

<sup>27</sup> Supra note 26.

<sup>28</sup> [http://www.etcgroup.org/en/materials/publications.html?pub\\_id=615](http://www.etcgroup.org/en/materials/publications.html?pub_id=615) (last accessed March 25, 2008).

<sup>29</sup> Blakeney, M. (1989) *Legal Aspects of Technology Transfer to Developing Countries* (Oxford: ESC Publishing).

<sup>30</sup> <http://www.twinside.org.sg/title/pir-ch.htm> (last accessed March 25, 2008).

<sup>31</sup> <http://www.american.edu/TED/enola-bean.htm> (last accessed March 25, 2008).

<sup>32</sup> A. Y. Kitua, H. M. Malebo (2004) *Malaria Control in Africa and the Role of Traditional Medicine* (In: *Traditional Medicinal Plants*; eds. M. Willcox, G. Bodeker, P. Rasoanaivo, J. Addae-Kyereme). London: CRC Press.

<sup>33</sup> <http://www.american.edu/ted/turmeric.htm> (last accessed March 25, 2008).

<sup>34</sup> I. S. Johnson, J. G. Armstrong, M. Gorman, J. P. Burnett (1963) The vinca alkaloids: a new class of oncolytic agents *Cancer Res.* 23: 1390.

Vinblastine and Vincristine. Eli Lilly applied for a patent, which was granted in 1967.<sup>35</sup> While the Rosy Periwinkle was never traditionally used as a cancer-fighting medicine, Western scientists would never even have started to investigate the plant if it were not for its traditional medicinal use. During the lifetime of the patent, Eli Lilly made millions of dollars from drugs derived from the Rosy Periwinkle alkaloids. The people of Madagascar, however, never received any compensation for the use of their traditional knowledge.<sup>36</sup>

### 3.2. Hoodia Cactus (South Africa)

The Hoodia cactus, native to South Africa, has been at the center of the conflict between an indigenous community and a national government agency. The San, an indigenous community living in the Kalahari Desert of southwest Africa, have been using the Hoodia cactus for centuries to block feelings of hunger on long hunting trips. The story really started when researchers at the Council of Scientific and Industrial Research (CSIR),<sup>37</sup> a governmental organization that undertakes directed and multidisciplinary research, started to investigate the properties of the Hoodia cactus. Scientific tests showed that animals given the cactus lost weight rapidly without any apparent negative side effects. This discovery led eventually to a patent on the active compound derived from the Hoodia. In 1997, the CSIR sold the licensing rights to an English biopharmaceutical firm, Phytopharm. Phytopharm then sold the license to the pharmaceutical company Pfizer for 21 million dollars.<sup>38</sup> Throughout the whole process, the San people were unaware what was going on. Only after Phytopharm sold the license to Pfizer, causing an excessive media coverage, did the San people become aware of the 21 million dollar deal.<sup>39</sup> In 2001, leaders from various San communities met with a lawyer to organize resistance against this injustice. Eventually, the CSIR was threatened with a lawsuit. Hoping to avoid international scrutiny and bad press the CSIR entered into a dialogue with the San people. A memorandum of understanding was eventually issued acknowledging the San's prior rights regarding the cactus' appetite suppressant properties. Furthermore, royalties from any future sales were promised.

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<sup>35</sup> US Patent NO. 3,352,868.

<sup>36</sup> Karasov, C. (2001) Who Reaps the Benefits of Biodiversity?, *Environ. Health. Perspec.* 109: A582.

<sup>37</sup> The CSIR is one of the leading scientific and technology research, development and implementation organizations in Africa. Constituted by an Act of the South African Parliament in 1945 as a science council, the CSIR undertakes directed and multidisciplinary research, technological innovation as well as industrial and scientific development to improve the quality of life of the country's people (according their website: [http://www.csir.co.za/about\\_us.html](http://www.csir.co.za/about_us.html)).

<sup>38</sup> *Supra* note 32.

<sup>39</sup> R. Wynberg (2004) Rhetoric, Realism and Benefit-Sharing: Use of Traditional Knowledge of Hoodia Species in the Development of an Appetite Suppressant, 7 *J. World Intell. Prop.*, 851: 859.

#### 4. Possible solutions to the imbalance between TRIPS and CBD

As described in the previous sections, the protection of traditional knowledge is not adequately assured under the TRIPS regime. Knowledge derived from traditional communities is easily appropriated by private or foreign entities, with no guarantee of benefiting the original right holders or protecting biodiversity. Even though the CBD proclaims noble overall objectives (e.g. conservation of biological diversity, the sustainable use of its components, equitable sharing of the benefits), in practice the CBD lacks the proper instruments to enforce these provisions. The TRIPS agreement is the more powerful in this regard, first because it is directly tied to WTO membership and secondly, because it contains clear provisions on the enforcement of intellectual property rights (Part III) as well as provisions on dispute prevention and settlement (Part V). Moreover, according to the Vienna Convention on the law of treaties,<sup>40</sup> the agreement that is more recent or more specific will prevail. In the case of the CBD and TRIPS agreement both factors would give precedence to TRIPS.

The differences and inequality of these two agreements did not go unnoticed by the international community. In fact, the relationship between the TRIPS agreement and the CBD was the subject of two meetings in 1996: (a) the WTO's Committee on Trade and Environment (CTE) and (b) the Conference of the Parties to the CBD (COP). Not very surprisingly, perhaps, the CTE reiterated that TRIPS already contained adequate protection for the environment. According to Article 27(2), members can refuse patents that may endanger the environment.<sup>41</sup> No other concessions were proposed. The COP, the governing body of the Convention that advances implementation of the Convention through the decisions taken at its periodic meetings, did not draw any firm conclusions either. Nor were there any statements regarding inherent conflicts between the CBD and TRIPS.<sup>42</sup> However, it was agreed that further work was needed to investigate the relationship between the relevant provisions that might conflict with the CBD. More recent meetings<sup>43,44</sup> addressed some of these issues, but again, no firm conclusion was reached. In the TRIPS-related Doha Declaration of 2001, it was agreed to review Article 27 as well as the rest of the TRIPS agreement in relationship to the CBD; however, this is an issue with strong opposing standpoints

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<sup>40</sup> Signed on the 23rd May 1969 and entered into force on 27th January 1980.

<sup>41</sup> Provided their commercial exploitation is prohibited as a necessary condition for the protection of the environment. [http://www.wto.org/english/tratop\\_e/envir\\_e/issu3\\_e.htm#trips](http://www.wto.org/english/tratop_e/envir_e/issu3_e.htm#trips) (last accessed March 25, 2008).

<sup>42</sup> <http://www.iisd.ca/biodiv/cop3/COP3-23-vfinal.htm> (last accessed March 25, 2008).

<sup>43</sup> COP 4 - Bratislava, Slovakia, 4 - 15 May 1998: Article 8(j) and related issues (traditional knowledge) and benefit sharing.

<sup>44</sup> COP 6 - The Hague, Netherlands, 7 - 19 April 2002: Benefit-sharing.

and therefore productive of ongoing international debate.<sup>45</sup> Given the slow progress on harmonization, organizations and private individuals are considering solutions outside these treaties. In the following section, some of these solutions are outlined.

#### **4.1. Trade Secret Protection**

Patenting traditional knowledge can be challenging. Indigenous communities often lack the resources to successfully apply for a patent or to engage in opposition and/or litigation procedures. Another obstacle to successful application for a patent is the requirement to disclose the inventor (at least for U.S. patent applications<sup>46</sup>), who might be difficult to identify in the case of patents on traditional knowledge. In the light of these challenges, one of the simplest ways of preventing exploitation of traditional knowledge seems to be to keep it secret. Besides, keeping it secret does not require any government involvement or registration. However, keeping something secret is one thing and qualifying for a legally valid trade secret is quite another. Although legislation may be different in different jurisdictions, the protection of knowledge as a legally valid trade secret usually requires three conditions.<sup>47</sup> First, the information must be a secret; secondly, the secret must have some commercial value; thirdly, reasonable efforts must have been made to keep the information secret. A large amount of traditional knowledge could be viewed as being in the public domain, since it is widely shared among members of indigenous groups. Similarly, it would be difficult to demonstrate that reasonable steps were undertaken to protect the knowledge. Finally, a trade secret does not protect against reverse engineering or independent development.<sup>48</sup> To sum up, traditional knowledge can be kept secret, but it is virtually impossible to qualify it as a legally valid trade secret.

#### **4.2. Databases**

One big challenge regarding traditional knowledge is its availability in written form. Since it is often passed down orally, it is difficult to assess whether a given patent is really novel or whether it contains traditional knowledge. A possible solution is to collect traditional knowledge on a publicly accessible database. This would allow patent offices to determine whether knowledge contained in a patent application is derived from traditional knowledge, or is indeed novel. A study conducted by the Indian National Institute of Science Communication and Information

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<sup>45</sup> W. New (2008), Proponents: 'Time Is Now' For TRIPS Biodiversity Amendment In Doha Round Intellectual Property Watch 8 May 2008. <http://www.ip-watch.org/weblog/index.php?p=1030> (last accessed March 25, 2008).

<sup>46</sup> 35 USC § 111: Application.

<sup>47</sup> US Trade Secret Act (amended 1985), 14 U.L.A. 438.

<sup>48</sup> Supra note 47.

Resources (NISCAIR) found that “in 2000, almost 80% of the plant-based medicinal patents in the US Patents Office related to seven medicinal plants of Indian origin,”<sup>49</sup> showing a strong need for such a database. After several U.S. patents<sup>50</sup> were granted on turmeric, a medicine and spice that had been used in India for centuries, India and other countries decided to implement a central database to record traditional knowledge that was often only available in oral form, and hence difficult to protect. The Traditional Knowledge Digital Library (TKDL), as this database project was called, was established in June 2001 through various Indian governmental organizations<sup>51</sup> in order to prevent future misappropriation of traditional knowledge through patent abuse.

### 4.3. Disclosure of Origin

Another possible way to protect traditional knowledge is to require the patent applicant to disclose the source of her biological material.<sup>52</sup> Such a provision would help to prevent the misappropriation of genetic material. Since the TRIPS agreement already provides for the protection of geographical indications, the inclusion of a disclosure of origin requirement along with the provision of patentable subject matter in article 27(1) would be relatively straightforward. This could certainly decrease the number of patents containing “bio-pirated” genetic material. At the same time, evidence of the knowledge holder’s permission could also be included. So far, only Costa Rica<sup>53</sup> and the Andean Community<sup>54</sup> have passed statutes requesting patent applicants to provide indication of origin of their genetic material. In some cases, a demonstration of prior informed consent from indigenous communities is also required.<sup>55</sup> Although prior informed consent is already codified in the CBD, and adopted in the Bonn Guidelines,<sup>56</sup> these guidelines provide only a voluntary framework and are not binding.

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<sup>49</sup> <http://www.scidev.net/en/news/digital-library-to-protect-indigenous-knowledge.html> (last accessed March 25, 2008).

<sup>50</sup> US Patents nos. 4,719,111 (1988), 5,120,538 (1992), 5,252,344 (1993), 5,401,504 (1995).

<sup>51</sup> Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) and National Institute of Science Communication And Information Resources (NISCAIR).

<sup>52</sup> D. D. Keating (2005) Access to Genetic Resources and Equitable Benefit Sharing Through a New Disclosure Requirement in the Patent System: An Issue in Search of a Forum, 87 J. Pat. & Trademark Off. Soc’y 525: 545.

<sup>53</sup> The 1998 Biodiversity Law of Costa Rica requires a certificate of origin to accompany applications for intellectual property rights. Final report, July 2003, study commissioned by the Secretariat of the CBD and distributed in document UNEP/CBD/WG-ABS/2/INF/2 (29 Sept. 2003).

<sup>54</sup> Community Decision of the Andean Community (‘Common Regime on Access to Genetic Resources’), signed on 2 July 1996. It requires consent for the actual and potential use of a resource, covering both genetic resources and any derivatives of genetic resources. Final report, July 2003, study commissioned by the Secretariat of the CBD, and distributed in document UNEP/CBD/WG-ABS/2/INF/2 (29 Sept. 2003).

<sup>55</sup> <http://www.grain.org/docs/costarica-biodiversitylaw-1998-en.pdf> (last accessed March 25, 2008).

<sup>56</sup> <http://www.cbd.int/doc/decisions/COP-06-dec-en.pdf> (last accessed March 25, 2008).

#### 4.4. Prospecting Agreements

Yet another method is to broker deals with corporations that want to exploit a country's genetic resources. With such agreements, a state is at least sure of obtaining some compensation for the use of genetic resources, even if it does not reflect the proper value of those resources. At the same time, corporations are interested because such agreements might help to balance bad publicity relating to their exploitation efforts. One of the first of such agreements was struck between the U.S. pharmaceutical firm Merck and the National Biodiversity Institute (INBio), an organ of the Costa Rican government. In 1991, Merck paid INBio an initial amount of \$1 million (\$135,000 of it in laboratory equipment), and agreed to pay royalties on profits made from any drug developed in the future.<sup>57</sup> Furthermore, Merck agreed to fund research facilities and train scientists in Costa Rica with the long-term goal of establishing independent research in Costa Rica.<sup>58</sup> In turn, Merck will own all patents that will result from the bioprospecting agreement. The Costa Rican government pledged to use half of the royalties earned for the conservation of biological diversity.<sup>59</sup> Certainly, channeling money through a governmental apparatus has its own challenges. But even if the conservation of biological diversity will not directly benefit the holders of the traditional knowledge, it will indirectly protect the indigenous people's habitat.

A similar deal was struck between the Swiss pharmaceutical company Novartis and the Brazilian Association for the Sustainable Use of the Biodiversity of Amazonia (BIOAMAZONIA) in 2000.<sup>60</sup> In this agreement Novartis agreed to pay the Brazilian institute \$4 million over a period of three years for the export of 30,000 biological samples from the Brazilian Amazon. Unlike the deal between Merck and INBio, Novartis did not stipulate that any of the funds had to be used for preserving biodiversity. In addition, Novartis obtained the raw materials, which were processed at Novartis laboratories. In the Merck agreement, INBio actually performed initial testing and sent Merck only the promising extracts. Hence, Merck honored the CBD's goal of "promoting scientific and technological advancement" in less-developed countries, whereas Novartis simply ignored it.

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<sup>57</sup> D. S. Tilford (1998) Saving the Blueprints: The International Legal Regime for Plant Resources, 30 Case W. Res. J. Int'l L. 373: 437.

<sup>58</sup> V. E. Spier (2001) Finders' Keepers: The Dispute Between Developed and Developing Countries Over Ownership of Property Rights in Genetic Material, 7 Wid. L. Symp. J. 203: 222.

<sup>59</sup> M. D. Coughlin, Jr. (1993) Using the Merck-INBio Agreement to Clarify the Convention on Biological Diversity, 31 Colum. J. Transnat'l L. 337: 356.

<sup>60</sup> R. L. Scott (2003) Bio-conservation or bio-exploitation: an analysis of the active ingredients discovery agreement between the Brazilian institution BIOAMAZONIA and the Swiss pharmaceutical company Novartis", Geo. Wash. Int'l L. Rev. 35: 977.



## 5. Conclusion

Biopiracy is a term used to describe the unauthorized use of traditional communities' knowledge of biological resources. Cases of biopiracy have been reported worldwide and include the Rosy Periwinkle, the Neem Tree, the Enola Bean, the Hoodia cactus, Turmeric, and many others. The two most important treaties regulating traditional knowledge, the CBD and the TRIPS agreement, have generated considerable friction and uncertainty regarding how to interpret international contracts involving IPRs. The CBD's focus is on protecting biological diversity as "a common concern of humankind" and using biological resources in a sustainable manner. As such it includes principles for the fair sharing of benefits arising from the exploitation of biological resources and traditional knowledge. The TRIPS agreement, on the other hand, is an international agreement administered by the World Trade Organization (WTO) setting minimum standards for intellectual property (IP) regulation. Hence, whereas the CBD is directed towards conservation of biodiversity and defending the rights of developing countries, TRIPS promotes private ownership and exploitation of such resources through patents and other means. The differences regarding the provisions of these two agreements have not gone unnoticed by the international community. Several efforts have been undertaken by governmental organizations (e.g. WTO's Committee on Trade and Environment, Conference of the Parties to the CBD) but due to competing interests of the attending parties progress has been slow, if not non-existent. This has led some organizations and private individuals to propose other solutions that do not directly rely on either the CBD or the TRIPS agreement. Proposed solutions include protection of traditional knowledge through trade secrets, databases, disclosure of origin, prospecting agreements, and other solutions. Certainly, none of the proposed solutions represents a silver bullet for the problem of biopiracy; however, if they are used in combination, a more equitable sharing of profits can be achieved and at the same time we can conserve the biodiversity of our planet.