TRIPS AND BIOTECHNOLOGY VS CBD AND BIODIVERSITY: IS IT BIO-PROSPECTING OR BIO-PIRACY OF DEVELOPING COUNTRIES' TRADITIONAL KNOWLEDGE?

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Introduction

Realm of the intellectual property rights especially matters related to the protection of Biodiversity associated traditional knowledge have been marred by the overlapping of the provisions in various prevalent conventions. Perhaps, the highest levels of divergence in this regard are related to the TRIPS agreement under the auspicious of WTO and the CBD under auspicious of United Nations.

The growing interaction and interdependence between local cultures and modern science in the sphere of biodiversity conservation and utilisation have raised both ethical and commercial questions. The pertinent issues are embodied in both the Convention on Biodiversity (CBD), which seeks to conserve biodiversity and protect community rights, and the World Trade Organisation (WTO) agreement on Trade Related Aspects of Intellectual Property Rights (known as the TRIPS agreement), which emphasise private property rights over community rights. There are substantive conflicts between the goals of TRIPS and those of the CBD, reflecting the lack of international consensus on these difficult questions of rights and equity. An examination of such grey areas in the specific context of developing countries like India is being attempted in this paper.

TRIPS and Developing Countries

The TRIPS Agreement that was enforced in 1994 is widely described as a regime of "hyperownership," (Safrin 2004: 641) capable of radically reshaping intellectual property law, especially with regard to genetic resources and biodiversity. Prior to the 1994 adoption of TRIPS as part of the Uruguay Round of the GATT multilateral trade negotiations, intellectual property was not covered by the GATT agreement. Instead, each country had its own national intellectual

property laws, with a few international conventions like the Berne Convention and the International Union for the Protection of New Varieties of Plants (UPOV) serving as a common backdrop. Traditionally, intellectual property was a domestic, rather than an international issue; states were free to set their own level of protection based on their particular circumstances. TRIPS changed all that by establishing universal and uniform standards for intellectual property law. To generalise, the United States, the European Union and Japan had expansive intellectual property regimes that provided strong protections to individual inventors for a broad array of inventions. Developing countries, by contrast, granted fewer protections to a more narrow class of inventions, and many refused to recognise intellectual property claims to medicines, foods and other essential items. India, for example did not permit patenting of pharmaceuticals or living organisms. TRIPS, by contrast, imposed a one-size-fits-all approach that created mandatory minimum standards regardless of the state's domestic situation (Bratspies 2006-2007: 324-325).

International IP law has largely been created and promulgated by developed countries. When taken from the perspective of developing nations, the formation, evolution, and current status of international IP laws are extraordinarily different. Michael Finger (1999) describes the prevailing attitude reflected in the TRIPS agreement: it is about the knowledge that exists in developed countries, about developing countries' access to that knowledge, and particularly about developing countries paying for that access. Finger further states that international IP laws have largely overlooked the “knowledge that exists or might be created in developing countries”; when it has been addressed, it is to protect 'traditional knowledge' against misappropriation by industrial country interests" and police "'bio-piracy' on the part of the industrial country interests."

Some scholars believe that TRIPS agreement reflects superior social and political attitude of Europe which desire to extend to all non-Europeans. Some other believe that it kind of power struggle between European countries "to secure national economic interests against other European countries in colonial territories." Because decolonisation paved way for developing countries to participate in the international legal framework and became involved with international IP laws. When this occurred, there was a brief scramble to ensure the continuity of IP laws in order to protect foreign interests in those developing countries.

Many scholars view intellectual property rights as a "means for all the European countries to control competition from former colonies as global rights became an entrenched

feature of international economic relations." To ensure this continuity and accession to international treaties, developing countries were allowed a lower set of obligations under international treaties. This lower bar for compliance also meant a lower level of power within the international intellectual property framework, and many of the changes made in the twentieth century reflected this trade off. Although occasionally, developing countries together could make some impact on the international legal framework, the power of developing countries within the international organisations was weaker than developed countries.

Negotiations for the TRIPS agreement were an exhaustive process, and in the end both developed and developing countries compromised. Nonetheless, TRIPS radically changed the face of international IP law. The TRIPS agreement provided "minimum standards for legal recognition of intellectual property rights" that were basically the standard levels already in place in most developed countries. In 1996, one scholar thinks that if TRIPS is successful across the breathtaking sweep of signatory countries, it will be "one of the most effective vehicles of Western imperialism in history (Loew 2006: 178-180).

Indeed, TRIPS was intended to standardise these differences in intellectual property protection between the nations of the global north and the global south. Because the United States, the European Union, and, to a lesser extent, Japan wield tremendous influence in the WTO, their voices drew the most attention in the process of drafting the TRIPS agreement. These nations were, in turn, influenced by the commercial interests of their corporate citizens. In fact, the TRIPS agreement was drafted and introduced in the Uruguay Round of GATT by an American industry coalition, the Intellectual Property Committee (IPC), which conducted what it called "missionary work" to sell the idea to the international community (Bratspies 2006-2007: 325).

The WTO negotiations succeeded in reshaping international trade because the process bundled previously unrelated areas into a single take-it-or-leave-it package. To participate in the global economy, states had to agree to abide by all the agreements that make up the WTO. Among the mass of terms were new intellectual property standards. By linking specified levels of intellectual property protection to previously unrelated trade issues, such as labour and environment, the TRIPS negotiation forced developing countries to sign on to higher standards of intellectual property than their state of development would otherwise have dictated. These intellectual property standards are having profound effects (Salazar-Xirinachs 2000: 381).

From the standpoint of economic development and technology transfer, a United Nations Development Program ("UNDP") report stated that "'countries at low levels of human technological capability cannot benefit significantly from TRIPS . . . Developing countries are not likely to be even at least as well off under TRIPS as they would be outside it.'" While some critics, such as the UNDP, call for TRIPS's abolition, others argue that it is workable for developing countries if interpreted appropriately. Everyone agrees that the short-term consequences will be massive resource transfers from developing countries to owners of intellectual property. The World Bank has estimated that TRIPS should yield an annual nineteen billion dollars for the United States, whereas South Korea would sustain the largest loss - fifteen billion dollars (Salazar-Xirinachs 2000: 381).

Many scholars have commented on these marked asymmetries in the development of intellectual property norms and principles captured by the TRIPS agreement. Nowhere is that asymmetry as sharply delineated as it is in the treatment of the claims of indigenous peoples to a property interest in their traditional knowledge and biological resources. This asymmetry stems in large part from one of the most significant changes in intellectual property rights through TRIPS - the expansion of the kinds of things that will be patentable (Heald 2003: 249).

In particular, TRIPS Article 27, entitled "Patentable Subject Matter," requires marked changes to the domestic patent law of many states. Under Article 27.1, states must ensure that patents "shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application." The most controversial portion of the TRIPS agreement, at least from the indigenous rights perspective, has been Article 27.3's requirement that states include plants and animals within the inventions eligible for patenting or develop a sui generis plan for protecting these inventions (Bratspies 2006-2007: 326).

Arguably there is room within TRIPS agreement to reshape implementation in a manner that protects traditional knowledge.(Chon 2006: 2821) Article 7 identifies the objectives of the entire TRIPS agreement as to "contribute to the promotion of technological innovation and to 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, and to a balance of rights and obligations." This language, together with Article 8, which provides that member states may adopt measures necessary to protect public health and to promote the public

interest in "sectors of vital importance to their socio-economic and technological development," was included in the final TRIPS agreement at the behest of developing countries. These provisions have become something of a rallying cry for groups attempting to blunt the force of Article 27.3 (Bratspies 2006-2007: 326-327).

Recently, there has been some modest success in this campaign. In Paragraph 19 of the Doha Round Ministerial Declaration, for example, negotiators reaffirmed that Article 27.3(b) needs to be reconsidered in light of the Article 7 and 8 objectives, with regard to traditional knowledge. (Sun 2003: 101-104) The Declaration emphasised that this is to be accomplished in the context of protecting the rights of developing states and the environment, with reference to CBD. Nonetheless, the focus to date has been predominantly on protecting producers by expanding protections rather than on balancing interests (Sun 2003: 104-105).

According to the WTO, "intellectual property rights are the rights given to people over the creations of their minds." Yet the way TRIPS is structured against indigenous groups to claim any intellectual property rights over the unmediated products of their traditional knowledge. As a result, indigenous and traditional knowledge is consigned to the global commons. This produces a striking imbalance - the "creations of the mind" of modern science are considered property and eligible for the full panoply of TRIPS protections, while the "creations of the mind" of indigenous peoples are not (Bratspies 2006-2007: 327).

When goods and services are made possible by combining traditional knowledge with western science, the contributor of the western scientific thinking is entitled to patent protection - a recognition of his or her property interest in creations of the mind - under TRIPS, the contributor of traditional knowledge is entitled to nothing. At its worst, TRIPS legitimises the transfer of exclusive ownership and control of biological resources and traditional knowledge from indigenous innovators to western ones, with no recognition, reward or protection for the contributions of the indigenous innovators (Kadidal 1993: 223).

Thus, in the definitional moment itself, TRIPS excludes indigenous innovation about biological diversity from what will be property in this new globalised legal world. This treatment stands as a sharp contrast to the patent rights that biotechnology routinely generates, and that TRIPS requires be recognised. By defining property to exclude the resources of indigenous peoples while including what is developed from those resources, this vision of property reconstructs the cycle of dependency that was at the heart of colonialism. TRIPS has to date

proven itself resistant to accommodating and protecting indigenous works within the hyper-owned world it has created. While the Doha Declaration recognised this problem of inequitable recognition of property rights, the Minister's state-based perspective suggests that the fundamental problem of inequity with regard to indigenous rights is unlikely to be resolved in the near future (Bratspies 2006-2007: 328).

Despite many countries' reservations over TRIPS, the past decade witnessed a strengthening of intellectual property rights legislation in developing countries. Although dissent over the role of intellectual property rights continues, strengthened intellectual property regimes appear to be the wave of the future, due in part to national commitments under TRIPS (Lesser 1998:197).

Despite optimistic predictions that TRIPS would lead to increased technological transfer and economic stimulation in developing countries, experience has shown that TRIPS tends to promote the importation of biotechnological products, not processes, into developing countries. Large pharmaceutical corporations from developed countries often apply for patents in developing countries but will not physically establish production facilities or research labs inside host countries. Many large biotechnological firms expressly precondition granting patent licenses on a host country's promise not to establish research facilities domestically. While these business practices may provide limited protection to large biotechnology firms, they inhibit the overall transfer of scientific knowledge and technology envisioned under Articles 66 and 67. Many agreements between foreign biotechnological firms and host countries charge excessive royalties or force developing countries' firms to purchase inputs from the patent holder exclusively. This likewise imposes additional costs on the developing world that may inhibit local development and increase prices of crucial biotechnological products, such as pharmaceuticals and certain crops (Ritchie 1996:439-440).

Not surprisingly, many developing countries remain reluctant to strengthen their intellectual property rights protections for a variety of reasons. First, increased prices for life-saving pharmaceuticals and other products have prompted many countries to thwart the patent provisions of the United States and the European Union by producing essential medicines locally. Moreover, TRIPS-compliance often imposes huge burdens on developing economies. To comply formally with the TRIPS Agreement, countries must establish industrial property registries, develop enforcement mechanisms, combat piracy, and prosecute criminals (Visser 2004:208).

In sum, the TRIPS Agreement made many promises for facilitating the equitable transfer of technology to developing countries. Although strengthened intellectual property protection enabled a handful of developing countries to obtain greater FDI than before the TRIPS Agreement, the overall impact of TRIPS on technology transfer has been dismal. Despite the predictions of many economists and scholars alike that increased intellectual property protection will result in technological development both domestically and abroad, the fruits of this transfer have yet to provide any substantial gains for most developing countries. Consequently, the net effect of Articles 66 and 67 has resulted in little effective technology transfer and benefits-sharing to developing countries (Maskus 2000: 239).

Biotechnology versus Biodiversity

Perhaps, one of the most contentious areas in the negotiations under WTO and CBD is on the matters related to the protection of biodiversity associated traditional knowledge. As a matter of fact, protections of such resources have been confronting a severe crisis primarily due to the provisions for patenting of life forms enforced by the TRIPS Agreement. These provisions have found a place in the TRIPS Agreement primarily due to revolutionary breakthrough in the biotechnology industry under monopoly control of multinational companies based in United States and Europe. It has been rightly argued that the challenges posed by biotech multinational companies have redefined the very notion of security.

The rapid growth of the biotechnology industry over the past two decades led many countries to recognise the vast economic potential of their genetic resources and indigenous knowledge (Sharma 1995). With increasing demand for new biotechnological products, the global community is struggling to strike a balance between the interests of host countries, who seek remuneration for supplying genetic resources and traditional knowledge, and biotechnological inventors, who are pressing for free access, open markets, and stronger intellectual property rights protection.

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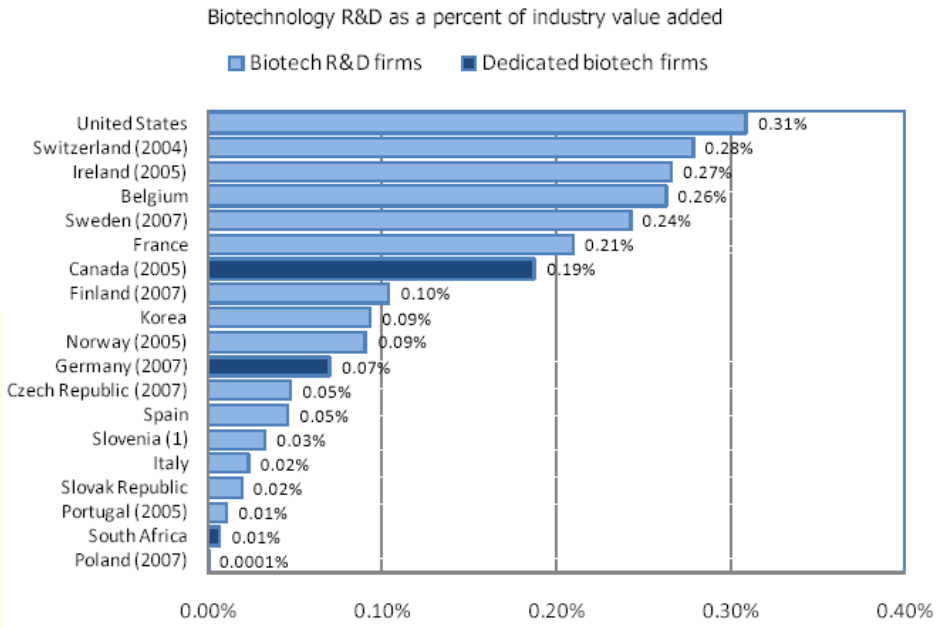

Source: Brigitte van Beuzekom and Anthony Arundel (2009): "OECD Biotechnology Statistics," at http://www.oecd.org/dataoecd/4/23/42833898.pdf

Industrialised countries, seeking to maintain incentives for new innovations through a strong intellectual property rights regime, viewed many developing countries' wishes to assert sovereign control over their resources as barriers to free trade (Sharma 1995: 15-17). In contrast, many developing countries viewed intellectual property rights as a tool for industrialised countries and multinational corporations to gain free access to their resources without sharing in the benefits derived from these resources (Lesser 1998). Consequently, developing countries began to assert their sovereign right to control the resources within their territorial jurisdictions.

Pharmaceutical corporations and Agribusiness increasingly rely upon these resources to engineer new drugs and genetically modified crops for sale in the international market. Developing countries, home to over eighty percent of the world's biodiversity**, (**Straus 2000:142) have become hotbeds for bio-prospectors searching for the next big breakthrough in medicine or agriculture. As a result of the high stakes involved in this multi-billion dollar industry, the global community, in seeking to facilitate the equitable sharing of benefits, is struggling to strike a balance between the interests of biological suppliers and biotechnological inventors.

The Convention on Biological Diversity (CBD) and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) mirror the conflicting views of industrialised

and developing countries concerning intellectual property rights. Industrialised countries view the CBD with a suspicious eye, as it precariously balances the sovereign rights of states with intellectual property protections. In turn, developing countries often viewed TRIPS as a tool for affording multinational corporations access to their resources without sharing in the benefits derived from them.

The conflict over intellectual property rights is partially the result of an unequal distribution in the location and wealth of the world's global biodiversity (Sharma 1995). As a general rule, the richness in biodiverse natural resources is inversely related to latitude. Thus, the majority of the world's biological wealth is concentrated in the temperate regions of the globe (Kothari 1994: 67-72). Estimates indicate that nearly eighty percent of the raw genetic inputs used in biotechnology are from tropical developing countries (Straus 2000:142). The uneven distribution of the earth's biological resources, coupled with the superior technology, economic leverage, and scientific knowledge of developed countries, has resulted in serious inequities in the global biotechnology trade.

CBD and Developing Countries

The CBD represents a global framework aimed at protecting biodiversity**.** Although this agreement is largely an international treaty aimed at promoting the sustainable use of environmental resources, it also possesses important economic aspects that impact the application of intellectual property rights on the inputs of the biotechnological industry. The CBD approaches conservation based on the theory that what is perceived as having economic value tends to be used more efficiently, thus promoting the sustainable use of depletable resources (Lesser 1998).

For many decades Developed Countries have combated the counterfeiting of their products abroad. They have called “pirates” all the foreign enterprises, no matter whether big or small, who reverse engineered and copied their intellectual creations in order to form their own industrial capacity and skills and decrease the technological gap dividing developed and Developing Countries. But ironically enough, the biodiversity and traditional knowledge (TK) issue seems to reverse the roles in the game. Almost all industrialised countries do not have Peru’s plant varieties or anything like the Indian neem tree, not to mention any shamanic knowledge associated to those natural resources (Ghidini & Arezzo 2006).

The problem of biodiversity and TK stems from the circumstance that foreign researchers and scientists, backed by their own governments, take such resources without permission, and without granting any truly equitable sharing of benefits flowing from production of biodiversity-based drugs to the indigenous people, nor to their governments. Indeed, not only local natural resources and knowledge generate huge amount of profits to the exclusive benefit of such companies but also, as Professor Boyle has pointed out, they often go back to their country of origin embedded in strong patents that impede the very local communities, who have long studied and cherished them, to keep using their own heritage and scientific culture (Ghidini & Arezzo 2006).

The best way of protecting those communities in a way consonant to the principles expressed by the Convention on Biological Diversity is to grant them some form of entitlement to protect their tangible and intangible knowledge against its misappropriation. In 1992, the United Nations Conference on Environment and Development convened in Rio de Janeiro created the CBD. Generally, the CBD "established sovereign national rights over biological resources and committed member countries to conserve them, develop them sustainably, and share the benefits resulting from their use."

Over the centuries, many samples of unique genetic resources have been taken from their original country of origin to collections in industrialised nations. Many unique biological resources have yet to be catalogued or even discovered. These resources, which are concentrated in developing countries of high biodiversity**,** remain in demand as sources of leads for new products, or for scientific collections (Laird & Kate 2002). This demand has led many biodiversity rich developing countries to exercise their rights over biological resources established by the CBD by enacting national laws and rules to protect their resources (Gollin 1999). The extension of developing countries' laws to require informed consent and benefit-sharing as preconditions to access to biological resources has resulted in contractual arrangements between biodiversity source countries and biotechnology and pharmaceutical corporations seeking access to the biological resources. These agreements are variously referred to as either biodiversity prospecting agreements or access and benefit sharing agreements.

While national legislation relating to biological resources and biodiversity prospecting agreements is intended to protect countries' rights to their biological resources, it has also added new legal complexities. Intellectual property experts have not been extensively involved in the

establishment of such rules, with the result that they are of limited practicality.

While some biodiversity prospecting agreements may be fairly straightforward, many provide negotiated royalty payments in exchange for access and sample collection, and other agreements involve complex negotiations regarding the sharing and value of locally acquired and/or pre-existing indigenous knowledge regarding a developing country's biological resources (Barber et al., 2002: 371-74). Source countries may place a high value on these contracts in monetary, environmental, and political terms. Thus, legal representation that can adequately and appropriately handle the intellectual property issues that arise in the context of biodiversity prospecting agreements is crucial.

The concerns of developed and developing countries resulted in various concessions that are reflected throughout the text of the CBD. In Article 16, for example, the CBD consistently acknowledges the importance of intellectual property rights and stipulates that these rights be honored. Nevertheless, Article 16 places conditions on adherence to intellectual property rights by requiring mandatory technology transfer and benefits-sharing obligations when necessary to meet the goals of the CBD. The end result was an international agreement that arguably fell short of meeting the expectations of both developed and developing countries because of its compromised and often ambiguous language (Maskus 2000:225).

Despite the shortcomings of the CBD, the agreement marked a crucial starting point for addressing the concerns of intellectual property rights and the trade of biotechnological products. By acknowledging the importance of intellectual property rights and the goal of equitably sharing the benefits derived from utilising the genetic materials of developing countries, the CBD came close to striking a balance between the divergent views of the developed and developing world.

TRIPS versus CBD: Conflict or Cooperation

There are few laws and regulations in force at present that have been explicitly enacted to govern access to genetic resources or to clarify the questions related to private versus community rights. Most countries face significant new challenges regarding administrative competencies and jurisdictions for regulating access to genetic resources, particularly given the partially conflicting directives of the major international treaties. Although CBD predates TRIPS, it is not clear which treaty takes precedence when conflicts occur; TRIPS has enforcement and penalty provisions, CBD does not, but both treaties have equal nominal authority. Thus the dearth of legal,

institutional, and scientific capacity to deal with these complex biodiversity, trade, and property rights issues is exacerbated by the lack of clarity within the international policy framework.

CBD vs. TRIPS	
Main CBD issues	Conservation of biodiversity Sustainable use of its components Fair and equitable sharing of benefits on derived products Protection of traditional access to genetic resources and technology
Main TRIPS issues	Reduce distortion and impediments to international trade Promote effective and adequate protection of intellectual property rights (IPR), including for plant varieties and other genetic innovations Ensure that measures and procedures to enforce IPR do not themselves become barriers to legitimate trade
Potential Conflicts	TRIPS asserts IPR protection on life forms; CBD asserts national sovereignty and right to prohibit such protection CBD promotes equitably shared benefits from use of biological resources and protection of traditional knowledge; TRIPS promotes private appropriation of benefits with no mechanism for acknowledging role of traditional knowledge from which industrial applications may derive
Potential Resolutions	Article 1 of TRIPS provides some flexibility, allowing domestic law to exceed minimum protection standards--a provision that could allow member nations to enact legislation to protect traditional knowledge Article 27.2 of TRIPS allows for the exclusion from patentability based on public order or morality Article 27.3b of TRIPS allows for the development of unique IPR protection systems for plants, animals, and essentially biological processes, creating an opportunity to develop alternative IPR regimes appropriate to the needs and conditions of traditional communities

Source: Data Compiled from TRIPS agreement and CBD

There are differences in rationale, origins and overall framework of the CBD and the TRIPS Agreement. TRIPS is a commercial treaty with commercial objectives that largely benefit

strong private firms. On the other hand, the establishment of the CBD was prompted mainly by the growing concern over the rapid worldwide loss of biodiversity, a recognition of the important role of traditional knowledge and the rights of local communities that develop and hold the knowledge, and the need to regulate access to and the sharing of benefits deriving from the conservation and sustainable use of biodiversity.

Article 16(5) of the CBD, in fact, recognises that IPR can have a negative effect on the implementation of the CBD provisions, and thus, urges Parties to cooperate to ensure that IPR are supportive and do not run counter to the CBD objectives. The discussions raised under the TRIPS Council have dealt with the relationship with the CBD, as well as the review of Article 27.3(b) (Gervais 2003:228-30). Nonetheless, developing countries argue that they feel consistently exploited because of structural imbalance between countries rich in biological diversity and those strong in technological and legal instruments.[1] They contend the CBD is intended to conserve and use biological diversity of developing countries on a long-term basis, while TRIPS is intended to provide private property rights over products and processes. According to the developing countries' standpoint, TRIPS Agreement influences the provisions of the pre-existing CBD in the access to genetic resources, the fair and equitable sharing of benefits from the utilisation of genetic resources, and the respect for traditional knowledge held by the indigenous communities.[2]

Based on the principle of national sovereignty enshrined in the CBD, countries have the right to regulate access of foreigners to biological resources and knowledge, and to determine benefit sharing arrangements. TRIPS enables persons or institutions to patent a country's biological resources (or knowledge relating to such resources) in countries outside the country of origin of the resources or knowledge. In this manner, TRIPS facilitates the conditions for misappropriation of ownership or rights over living organisms, knowledge and processes on the use of biodiversity takes place. The sovereignty of developing countries over their resources, and over their right to exploit or use their resources, as well as to determine access and benefit sharing arrangements, is compromised.

Developing countries argue that CBD Article 15.1 recognises the sovereign rights of States

[1] Jonathan Curci Staffler, "Towards A Reconciliation Between the Convention on Biological Diversity and TRIPS Agreement," *Graduate Institute of International Studies (IUHEI)*, Geneva, at http:// www.Botanischergarten.Ch/Patents/Staffler-Cbd-Trips.Doc

[2] Ibid.

over their national resources and that national government might determine access to genetic resources. Also, under CBD Articles 14.4 and 14.5, the CBD simply submits access to genetic resources to the "prior informed consent" of the party on mutually agreed terms aimed at sharing the benefits arising from the utilisation of such resources. However, on the contrary, it is said that biological resources should be subject to private intellectual property rights under TRIPS Articles 21 and 27. Thus, developing countries assert that the conflict arises, while national sovereignty in the CBD implies that countries have the right to prohibit patents on life forms, and TRIPS requires provisions of intellectual property rights on life forms.[3]

A key aspect of the CBD is that it recognises the sovereign rights of states over their biodiversity and knowledge, and thus gives the state rights to regulate access, and this in turn enables the state to enforce its rights on arrangements for sharing benefits. Access, where granted, shall be on mutually agreed terms (Article 15.4), shall be subject to prior informed consent (Article 15.5), countries providing the resources should fully participate in the scientific research (Article 15.6) and, most importantly, each country shall take legislative, administrative or policy measures with the aim of "sharing in a fair and equitable way the results of research and development, and the benefits arising from the commercial and other utilisation of genetic resources with the contracting party providing such resources. Such sharing shall be upon mutually agreed terms".

Under TRIPS, there is no provision for the patent holder on claims involving biological resources or related knowledge to share benefits with the state or communities in countries of origin. In fact, there is little that a country of origin can do to enforce its benefit-sharing rights (recognised in CBD) if a person or corporation were to obtain a patent in another country based on the biological resource or related knowledge of the country of origin. While a legal challenge can be launched, such legal cases are prohibitively expensive. Even if a state has the resources to legally challenge a patent in another country, it may not have the resources to track down and challenge every patent that it believes to be a case of bio-piracy against it, nor is there a guarantee of success. Thus, if the patent laws, the administration of approvals, or the courts of a particular country operate in a context that is favourable to granting such patents, there is little that can be done by a country of origin to ensure that bio-piracy does not take

[3] Ibid.

place, or that if it takes place that it can get a remedy.[4]

In the preamble of TRIPS, it is recognised that "intellectual property rights are private rights". Patents confer exclusive rights on its owner to prevent third parties from making, using, offering for sale, selling or importing the patented product, and to prevent third parties from using the patented process (and from using, selling or importing the product obtained from the patented process). In TRIPS, the award of IPR over products or processes confers private ownership over the rights to make, sell or use the product or to use the process (or sell the products of that process). This makes it an offence for others to do so, except with the owner's permission, which is usually given only on license or payment of royalty.

IPR, therefore, have the effect of preventing the free exchange of knowledge, of products of the knowledge, and their use or production. This system of exclusive and private rights is at odds with the traditional social and economic system in which local communities make use of, and develop and nurture, biodiversity. For example, seeds and knowledge on crop varieties and medicinal plants are usually freely exchanged within the community. Knowledge is not confined or exclusive to individuals but shared and held collectively, and passed on and added to from generation to generation, and also from locality to locality.

The CBD has several provisions that acknowledge this and also that aim at protecting community rights, the key provision being Article 8(j). However, the contribution and nature of community knowledge and community rights are not recognised in the TRIPS agreement. Instead, the patent system endorsed by TRIPS favours private individuals and institutions, enabling them to acquire "rights", including rights over the products or knowledge, whose development was mainly carried out by the local communities. TRIPS and the enactment of patent laws relating to biological materials in some countries have facilitated the misappropriation of the knowledge and resources of indigenous and local communities, and the number of "bio-piracy" cases has been increasing at a rapid rate. This misappropriation is counter to the principles and provisions of the CBD that oblige countries to recognise local community rights and fair benefit sharing. Indeed, one of the main objectives of establishing the CBD was to counter the possibility of misappropriation or "bio-piracy", whilst one of the effects of TRIPS has been to enable the practice of such misappropriation.

[4] Ibid.

Towards a review of TRIPS and CBD

In the review of TRIPS (which is provided for in Articles 27.3(b)), amendments should be made in Article 27.3(b) to bring the scope of exclusion of biological materials and processes in line with environmental and ethical considerations as well as the need for preventing bio-piracy; and an interpretation can be made that the sui generis option for plant varieties can include the protection of traditional knowledge and local community rights, in line with the CBD.

Amendments can also be made to TRIPS, in the context of the review under Article 71.1, to strengthen the obligations of developed countries to ensure the transfer of technology to developing countries, or to operationalise the implementation of technology transfer. Consideration can also be given to revise TRIPS to allow for exclusion or relaxation of standards of IPR relating to environmentally-sound technologies, and to technologies that relate to the use of biodiversity. This would bring TRIPS more in line with the spirit of the CBD, and with Article 16 provisions, including those dealing with technology transfer on concessional and preferential terms (para 2) and with the need to ensure that IPR are supportive of and do not run counter to CBD objectives (para 5).

In a review of the CBD, Article 16 could be amended to remove the tensions in Article 16, so that the important objectives and principles of access to and transfer of technology to developing countries are not so constrained, as with the present CBD, by the references to the need to be consistent with adequate and effective protection of IPR and international law. The obligations on technology transfer can also be strengthened and the implementation made more operational.

It should also be recognised that the present provisions in the CBD on access to genetic resources now place the onus of implementation on national policies and legislation. However, measures by national authorities are insufficient to enable effective implementation of access and benefit sharing arrangements. For example, in its national legislation, the state of a country of origin may require as part of its access contract that the collector cannot patent the product or knowledge (or that such a patent can be applied for only under certain conditions or benefit-sharing arrangement); but that state would require the cooperation of patent authorities or Biodiversity Authorities of other states to be able to monitor or effectively implement that contract. An international protocol would be required to establish guidelines and standards for

access and for fair and equitable sharing of benefits, as well as to establish international cooperation to facilitate implementation of the access and benefit-sharing arrangements.[5]

India as a founding member of both CBD and WTO initiated enactments of domestic laws in order to comply with her international obligations. The following sections illustrate how India was forced to enact Biodiversity Act 2002 and completely revamped intellectual property regimes in the wake of TRIPS agreement.

Traditional knowledge (TK) and Globalisation

The TK that indigenous peoples have developed over the course of the millennia, and which they still hold, has a fundamental role in the conservation and sustainable use of biodiversity**.** Where these peoples live in equilibrium with nature, harmonised ecosystems still exist. This maintains cultural diversity and their associated knowledge about flora, fauna, and ever-evolving interconnections.

Globalisation is jeopardising the normal development of many indigenous peoples around the world in three main ways. First, it is creating sophisticated legal mechanisms to control the management of vast territories in the name of conservation. Second, globalisation has exponentially increased the chances of acquiring first-hand information about the knowledge that indigenous peoples have of plants, animals, fungi and other living organisms, thus becoming medicinal prospects for pharmaceutical industries. Third, the intrusion of western styles in their traditional cultures and the exploitation of natural resources in their territories-a typical behavior of the western actor-have produced emigrations as well as the consequent subsuming of indigenous peoples as a whole.

This complex combination of factors has enhanced the erosion of TK, which in turn produces additional vulnerability of ecosystems. It has been shown that indigenous knowledge of medicinal plants and food decreases research and production costs by 40% or by $200 million a year. Ten years ago, the global pharmaceutical industry had yearly revenues for over $32,000 million. Traditional knowledge about ecosystems, specifically regarding medicinal plants and animals, has become the "green gold" of transnational corporations, representing increasingly important economic advantages for just a few.

[5] Third World Network (2001): "Intellectual property rights, TRIPS Agreement and the CBD," *TWN Statement to the 2nd meeting of the Panel of Experts on Access and Benefit Sharing*, Montreal, March 19-22, at http://www.twnside.org.sg/title/benefit.htm

From Bio-prospecting to Bio-piracy?

Bio-prospecting is defined as the "exploration of wild plants and animals for commercially valuable genetic and biochemical resources." Bio-prospecting is a fair enterprise based on certain legal conditions and benefit sharing. Bio-prospecting can help medical and other scientific research by collecting biological samples. Bio-piracy, on the other hand, occurs when corporations use the folk wisdom of indigenous people to locate and understand the use of medicinal plants and then exploit this knowledge commercially. Bio-piracy refers to the appropriation and monopolisation of a traditional population's knowledge and biological resources, including the smuggling of diverse forms of plants and animals. Bio-piracy results in traditional populations losing control over their resources (Song 2005: 271).

The term has gained popularity in use only over the past decade. Prior to that, research expeditions occurred regularly with the purpose of finding, collecting, and making use of the rich abundance of biological diversity worldwide with little to no legal repercussions.[6]

The expeditions funded by pharmaceutical companies are in no way undertaken for the simple goal of expanding knowledge of the unknown. Nor are they intended to satisfy the researcher's innate desire for learning. The entire purpose of these expeditions is to acquire as much local knowledge of traditional biological applications and collect "genetic samples from plants, animals and humans for later use in product research and development." The controversy stems from the multinational companies accumulating huge benefits while basically forgetting to share any of the profits with the countries providing the resources (Marden 1999: 279).

A rational definition of 'bio-piracy' would focus on activities relating to access or use of genetic resources in contravention to national regimes based on the CBD. Accordingly, a legitimate claim of 'bio-piracy' will involve unauthorised access to a controlled genetic resource and using that resource in a manner that contravenes the national regime. In practical terms, this means that (a) the activity in question occurred after the CBD came into force (December of 1993), and (b) the acts consist of a party gaining access without the consent of the source country, or in contravention to laws or regulations governing access to or use of genetic resources that the country has established.

This concept of bio-piracy stands in stark contrast to the claims of bio-piracy that are made with ever-increasing frequency by certain groups. For these groups, bio-piracy consists of

[6] Michael A. Gollin: "Biopiracy: The Legal Perspective," at www.actionbioscience.org/biodiversity/gollin.html.

an innovator gaining access (legitimate or otherwise) to some genetic resource, making an invention, and filing a patent application. Indeed, some groups make lists of 'examples' of bio-piracy that consist merely of patent applications. It is hard to see how the filing of a patent application can, in itself, amount to 'bio-piracy'. The filing of a patent application presumes that something beyond the information relating to the genetic resource has been developed; namely, an invention. By attacking the innovative process itself, including efforts to obtain intellectual property protection for inventions arising out of use of genetic resources, these groups will ultimately prevent or deter parties from even attempting to create benefits that could be shared under the CBD model. Of course, the CBD may require equitable sharing of the benefits from such an invention; if this does not take place, this could then reasonably be termed 'bio-piracy'. However, the wrong does not lie in filing the patent application, but in failing to deal fairly with the parties that helped create the opportunity for innovation.[7]

Interpreting Patent legislation: A case of bio-piracy

In 1980, the Supreme Court of United States indirectly addressed the question of whether bacteria qualified as patentable subject matter. The Court explained that the relevant consideration was whether the invention was the product of human intervention. This decision paved the way for future applications containing eukaryotic organisms. The PTO adopted the policy of addressing patentability on a case-by-case basis according to the precedent established in Chakrabarty. Chakrabarty, a genetic engineer employed by General Electric, developed a bacterium from the genus Pseudomonas that was capable of breaking down crude oil. It was suggested that the bacterium could be used for treating oil spills. With the organism originally rejected by the PTO as unpatentable subject matter, the issue eventually went to the Supreme Court. Ultimately, in a 5-4 ruling, the Court held in favour of Chakrabarty, stating "A live, human-made micro-organism is patentable subject matter under Title 35 USC 101. Respondent's micro-organism constitutes a 'manufacture' or 'composition of matter' within that statute." Just because the subject matter of the patent is a living organism does not bar the subject matter from patent protection. In other words, the Court's holding set the stage for future courts as well as the PTO to give wide scope to their interpretation of patent laws(Henry 2008: 3).

The Supreme Court decision in Chakrabarty was vital to progress in the biotechnology

[7] International Chamber of Commerce (1999): "TRIPS and the Biodiversity Convention: what conflict?," *Commission on Intellectual and Industrial Property*, June 28, at http://www.iccwbo.org/id418/index.html

industry. The industry uses an abundance of natural discoveries, particularly living organisms, in most of the new products it develops each year. From pharmaceuticals to agricultural engineering, the active ingredients behind many of the most remarkable inventions are from plants and organisms discovered in the diverse ecosystems of smaller, less developed countries. Company representatives travel to remote locations looking for "undiscovered" traditional medicine that could possibly be commercialised for profit (Henry 2008: 3).

Indeed, in the ten years following Chakrabarty's victory, patents were extended in rapid order to isolated and purified genetic sequences, to man-made plants, and to animals. By the turn of the millennium, raw biological material increasingly moved from an open access or global commons good to a private or government-owned good (Safrin 2007: 1927-28).

Conclusion

The forgoing discussion reveals that many developed countries and most developing countries had opposed the very inclusion of new themes in the Uruguay Round of GATT negotiations. However, the TRIPS Agreement was enforced on the international community at the insistence of the United States. Ever since the agreement came into force, there were huge opposition to most provisions in the TRIPS Agreement all over the world. A review of the provisions of TRIPS Agreement, which was attempted in this paper, reveals these provisions have radically altered the very nature, scope and duration of prevalent IPR provisions in national legislations. TRIPS have also introduced universal and uniform standard of protection in a fashion that one size fits all approach. From the standpoint of economic development and technology transfer, the findings of UNDP report that countries at low levels of human technological capability can not benefit significantly from TRIPS Agreement are serious and quite disturbing. The most controversial point of the TRIPS Agreement, at least from indigenous perspective, has been article 27.3 that requires state to include plants and animals within the inventions eligible for patenting or develop a sui generis plan for protecting these inventions.

Conversely, many of the provisions in the CBD are found to be in tune with the development aspirations and efforts to protect biodiversity and traditional knowledge resource base of developing countries. The mismatch in this regard is most evident in the article 16 (5) of the CBD and article 27.3(b) of TRIPS. Article 14.4, 14.5 and 15.1 of the CBD reinforce the need for ABS and PIC. In that sense, there are conflictual areas in the TRIPS Agreement and CBD which demand a review of such provisions so that the minimum interests of all stake holders are

protected. It would also restrict the tendencies opportunities for manipulation and unfair dealings through bio-piracy and bio-prospecting. A number of cases of bio-piracy have been reported from developing countries in Asia, Africa and South America, reflective and illustrative of the ambiguities and mutually contradictory prescriptions in the TRIPS and CBD.

An examination of Indian experience in this regard reveals that until the advent of TRIPS Agreement, the IPR protection in the country has served well the interests of the people and society on the one hand and the legitimate interests of the right holders on the other. Implementation of the TRIPS Agreement in India, as in the case of other developing countries, did experience a variety of challenges, the intensity of which was felt high in the realm of protection of indigenous and traditional knowledge as well as biodiversity resources.

In brief, the dearth of legal, institutional, and scientific capacity to deal with these complex biodiversity, trade, and property rights issues have been exacerbated by the ambiguity in the international regulatory framework. A review of the provisions in the TRIPS Agreement especially Article 27.3 is the essential minimum to prevent bio-piracy. The recognition of the provisions in the CBD especially those related to ABS and PIC will be in the interests of the protection of biodiversity associated traditional knowledge in developing countries.

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