

BIO-PIRACY: THE APPROPRIATION OF TRADITIONAL KNOWLEDGE

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Abstract

The anxiety of man to lead happy and prosperous life plays a vital role in the course of development. The scientists invent new technology, the researchers are engaged in searching new things, the authors are producing new literature and industrialists are producing new products by newly invented techniques. The things that man presents for the use of society can be originated only through the use of skill, labour, intellect and endeavour of his own. Every creation or performance takes its first shape in the mind of a human being and acquires a physical status on the execution of idea so conceived. Therefore, all that what is produced or originated by human skill, intellect, labour and effort is called the intellectual property. It is similar to any property consisting of movable or immovable things wherein the proprietor or owner may use his property as he wishes and nobody else can lawfully use his property without his permission. The result of developments having taken place around the world and the rapid dissemination of knowledge is that the common man has become more aware of intellectual property rights. In this paper, major issues as to protection of Traditional Knowledge are taken up. The obvious reason is that a number of cases relating to Traditional Knowledge have attracted international attention and the issue of Traditional Knowledge has been brought to the fore of the general debate surrounding intellectual property

Key Words: *Intellectual property, Biopiracy*

The term “Intellectual Property” has come to be internationally recognized as covering patents, industrial designs, copyright, trademarks, know-how and confidential information. Geographical Indications, Plant Variety Protection and Traditional Knowledge constitute a significant portion of IPR’s as well

Intellectual property, however, is not only about property. It is also about recognition of and respect for the contributions of identifiable human creators. From this perspective, intellectual property has a very important role to play in protecting the dignity of holders of Traditional Knowledge and, by conferring property rights in relation to such knowledge, giving those holders a degree of control of its use by others.

In this paper, major issues as to protection of Traditional Knowledge are taken up. The obvious reason is that a number of cases relating to Traditional Knowledge have attracted international attention and the issue of Traditional Knowledge has been brought to the fore of the general debate surrounding intellectual property. Moreover, in a world increasingly characterized as the “global information society,” we are witnessing, on the one hand, the rapid emergence of modern information technologies, and, on the other hand, an increasing awareness about “Traditional Knowledge” and its spiritual, cultural and economic values.

However, some questions like what do we mean by traditional knowledge; Who are its holders; and, does it need protection in the global information society have not been satisfactorily answered so far.

WIPO currently uses the term to refer to tradition based literary, artistic or scientific works; performances, inventions, scientific discoveries, designs, marks, names and symbols, undisclosed information and all other tradition-based innovations and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields.

Definition of Traditional Knowledge

To define Traditional Knowledge is in itself a tremendous task because the definition of Traditional Knowledge has so many legal implications. But still here an attempt is made to define this concept in a precise form.

First of all it is necessary to know the meaning of ‘traditional’

What makes knowledge ‘traditional’ is not its antiquity, much Traditional Knowledge is not ancient or inert, but is a vital, dynamic part of the contemporary lives of many communities today. It is a form of knowledge which has a traditional link with a certain community; it is knowledge which is developed, sustained and passed on within a traditional community, and is passed between generations, sometimes through specific customary systems of knowledge transmission. Traditional Knowledge often transmits the history, beliefs, aesthetics, ethics, and traditions of a particular people. For example, plants used for medicinal purposes also often have symbolic value for the community as may be witnessed in India. Many sculptures, paintings, and crafts are created according to strict rituals and traditions because of their symbolic and/or religious meaning.

A fundamentally important aspect of Traditional Knowledge is that it is traditional only to the extent that its creation and use are part of the cultural traditions of communities. In its use, Traditional Knowledge is also contemporary knowledge. This aspect is a further justification for legal protection.

Importance of Traditional Knowledge

Traditional knowledge systems are increasingly accepted as an important source of useful information in the achievement of sustainable development. Until the 1970s, development, planning and conservation policies were usually based on very negative assumptions about traditional rural societies. Poor rural dwellers were generally assumed to be backward and inimical to change, and their livelihood practices, such as shifting cultivation, were thought to be at best inefficient and unproductive and at worst environmentally destructive. More

enlightened attitudes towards the knowledge, skills and subsistence practices of rural communities in developing countries emerged in the 1970s.

Many multilateral and bilateral donor agencies including the World Bank, United Nations agencies such as FAO, UNESCO and UNEP, and several of the International Agricultural Research Centers now recognize the role of traditional knowledge in sustainable development. WWF's "Statement of Principles on Indigenous Peoples and Conservation" expressed appreciation of the enormous contribution indigenous peoples have made to the maintenance of many of the earth's most fragile ecosystems the goals of conserving biodiversity and protecting and securing indigenous cultures and livelihoods have sometimes been perceived as contradictory rather than mutually reinforcing.

Moreover, Traditional Medicine (TM) which constitutes a large part of traditional knowledge serves the health needs of a vast majority of people in developing countries, where access to modern health care services and medicine is limited by economic and cultural reasons. For instance, the per capita consumption of TM products, in Malaysia; is more than double that of modern pharmaceuticals. TM is also significant in more advanced developing countries such as South Korea, where the per capita consumption of TM products is about 36% more than modern drugs. It is often the only affordable treatment available to poor people and in remote communities. TM also plays a significant role in developed countries, where the demand for herbal medicines has grown in recent years. The world market for herbal medicines has reached, according to one estimate, US\$43 billion, with annual growth rates of 5 to 15%. For China, the leading country in this field, WHO estimates that TM generated income of about \$5 billion in 1999 from the international and \$ 1 billion from the domestic market. The European market in 1999 was calculated to be \$ 11.9 billion (where Germany had 38%, France 21% and United Kingdom 12%). Moreover, many pharmaceutical products are based on, or consist of, biological materials.

Examples of Internationally Acknowledged Traditional Knowledge

Some known examples of traditional knowledge will be worth mentioning here:

- In Vembur village, Tamil Nadu, India, there is a man by the name of Thiru Palchamy Gounder who has been curing animals since he was sixteen. Developing his trade under the guidance of his guru, Kandavilswamy, this traditional veterinarian has gained fame within his region for being able to cure a variety of bovine ailments. Using medications developed from local plants, he is able to treat such common malady as fractures, broken horns, swollen tongues, swollen faces and headaches. The treatments can last from two hours to a month, but the continued demand for these services provides little doubt as to the efficacy.
- Traditional ecological knowledge held by aboriginal communities in Canada has proven to be valuable in environmental planning and resource management; for some communities.

- May apple (*Podophyllum peltatum*) used by native Americans for centuries as an ameliorate for skin warts, ulcers and cancerous growths is the source of *Etoposide* used for the treatment of cancerous growths with a US \$ 500 million world market value; oil of evening primrose (*Oenothera*) used by indigenous populations in the Americas for skin problems is currently marketed for eczema and pre-menstrual problems with an estimated market of over \$400 million.
- Australian smokebush (*Conospermum*) given by aborigines to their old folk was found to contain Conocurvone, a substance that treats rheumatism and lumbago and destroys HIV virus in low concentrations now pays Australian \$100 million a year to the Western Australian Government for the exclusive privilege to develop the discovery.
- Sustainable irrigation is maintained through traditional water systems such as the *aflaj* in Oman and Yemen, and the *qanat* in Iran.
- In South India the medicinal knowledge of the Kani tribes led to the development of a sports drug named Jeevani, an anti-stress and anti-fatigue agent, based on the herbal medicinal plant *arogyapaacha*. Indian scientists at the Tropical Botanic Garden and Research Institute (TBGRI) used the tribal know-how to develop the drug. The knowledge was divulged by three tribal members, while the customary rights to the practice and transfer of certain traditional medicinal knowledge within the Kani tribes are held by tribal healers, known as *Plathis*. The scientists isolated 12 active compounds from *arogyapaacha*, developed the drug Jeevani, and filed two patent applications on the drug. The technology was then licensed to the Arya Vaidya Pharmacy Ltd., an Indian pharmaceutical manufacturer pursuing the commercialization of Ayurvedic herbal formulations.
- *Oryza longistaminata* is a wild rice growing in *Mali*. Local farmers considered it a weed, but the migrant *Bela* community developed detailed knowledge of its agricultural value. The *Bela* community developed systematic understanding of the distinct properties of this and other kinds of rice, and recognized that *oryza longistaminata* has stronger resistance to diseases such as rice blight than many other local kinds of rice. Guided by this traditional knowledge, researchers subsequently isolated and cloned a gene named Xa21, which conferred this resistance in rice plants.

This list is not exhaustive. There are innumerable examples of Traditional knowledge which have not been listed here as the other aspects of the concept also need attention.

Problems Faced By Holders Of Traditional Knowledge

The holders of traditional knowledge confront innumerable problems. WIPO sought to summarise the concerns of traditional knowledge holders as follows:

- The loss of traditional life styles and of traditional knowledge, and the reluctance of the younger members of the communities to carry forward traditional practices.
- Lack of respect for traditional knowledge and the holders of traditional knowledge is another problem. When we consider innovation, we refer to only formal systems of innovation, namely that done in universities, industrial R&D laboratories, etc. Often not recognized is the technology innovation that takes place in an informal system of innovation, be it by artisans, farmers, tribes or other grass root innovators. Indeed many societies in the Third World have nurtured and refined systems of knowledge of their own, relating to such diverse domains as geology, ecology, botany, agriculture, physiology and health. These informal innovators have, therefore, generated such a rich store of traditional knowledge.
- External social and environmental pressures, migration, the encroachment of modern lifestyles and the disruption of traditional ways of life can so weaken the traditional means of maintaining or passing knowledge on to future generations.
- The resources in question are often not owned by anyone in particular, but are the heritage of one or more communities, which are not necessarily cohesive, or all living in one country. While some genetic resources can be traced to very specific areas and habitats, in other cases they comprise components from many countries, in which benefit-sharing arrangements will be totally impractical. Because of this diversity of national circumstances or indeed those within nations in relation, for example, to their cultural, economic or institutional conditions, it is very difficult to devise legislation and practices which cover that diversity in ways that facilitate implementation of such measures.
- A further challenge is to address the international dimension of the protection of TK and benefit-sharing for associated genetic resources.

Some Other Points Of Concern Which Are Realized By Some Jurists Are:

- That one type of IPR system is being universalised and prioritized to the exclusion of all others, that causes the most legitimate disquiet among those peoples and communities that are least able to benefit from what to them is an imposed system. In that case indigenous peoples rightly see Western law as an imposition which seems to cancel out their own custom based regulations. After all, if indigenous peoples in WTO member states are required to accept the existence of patents that they are economically prevented from availing themselves of, why shouldn't their own knowledge-related regimes and jurisprudence be respected by others?
- Then the policy makers schooled in the Western legal system are apt to suppose that the only IPRs which exist are the ones referred to in TRIPS and the WIPO-administered

conventions. In fact, local and indigenous communities often have very complex custom-based intellectual property systems.

- Yet another problem is that whether widely known or not, once traditional knowledge is recorded and publicly disseminated, its use and application is beyond the control of the original knowledge providers. As witnessed earlier, if a researcher investigates a piece of published traditional knowledge and then improves upon it in a practical way, the result may well become a patentable ‘invention’ that this researcher can own. This problem has again come to fore as the US Patents and Trademarks Office is reported to have issued 150 yoga related copyrights and 134 patents on yoga accessories, besides 2315 yoga trademarks. Now as everybody knows that yoga constitutes a bigger part of Indian Traditional Knowledge, these copyrights and patents are likely to hit the rights of TK holders or even a common man in India as yoga is a way of life for them and not commercial commodity.
- Traditional knowledge holders do not have the political influence to change the system.
- Another problem confronting TK holders, which may be termed as the most serious is the commercial exploitation of their knowledge by others, technically called ‘biopiracy’ which raises questions of legal protection of TK against misuse, the role of prior informed consent, and the need for equitable benefit-sharing.

Biopiracy – The Misappropriation Of TK

Bio-piracy through IPRs has arisen as a result of the devaluation and invisibility of indigenous knowledge systems and the lack of existing protection of these systems.

The protection of Traditional Knowledge systems as systems of innovation and the prevention of piracy of biodiversity require a widening of legal regimes beyond the existing IPR regimes such as patents

Bio-piracy has been defined as the process through which the rights of indigenous (traditional) cultures to genetic resources and knowledge are erased and replaced for those who have exploited indigenous knowledge and biodiversity.

In fact, a large number of patents have been granted on genetic resources and knowledge obtained from developing countries, without the consent of the possessors of the resources and knowledge.

Moreover, many of the genes and micro-organisms may originate in developing countries, and thus “misappropriation” or biopiracy is taking place.

Some internationally noticed examples of Biopiracy are discussed here

Turmeric

The turmeric case is a landmark case as it was the first time that a patent based on the traditional knowledge of a developing country had been successfully challenged. The legal

costs incurred by India in this case have been calculated by the Indian Government to be about at US \$10,000. Turmeric (*Curcuma longa*) is a plant of the ginger family yielding saffron-coloured rhizomes used as a spice for flavouring Indian cooking. It also has properties that make it an effective ingredient in medicines, cosmetics and as a colour dye. As a medicine, it is traditionally used to heal wounds and rashes.

In 1995, two Indian nationals at the University of Mississippi Medical Centre were granted US patent no. 5,401,504 on "use of turmeric in wound healing". The Indian Council of Scientific and Industrial Research (CSIR) requested the US Patent and Trademark Office (USPTO) to re-examine the patent. CSIR argued that turmeric has been used for thousands of years for healing wounds and rashes and therefore its medicinal use was not novel. Their claim was supported by documentary evidence of traditional knowledge, including an ancient Sanskrit text and a paper published in 1953 in the Journal of the Indian Medical Association. Despite arguments by the patentees, the USPTO upheld the CSIR objections and revoked the patent.

Neem

Neem (*Azadirachta indica*) is a tree from India and other parts of South and Southeast Asia. It is now planted across the tropics because of its properties as a natural medicine, pesticide and fertilizer. Neem extracts can be used against hundreds of pests and fungal diseases that attack food crops; the oil extracted from its seeds is used to treat colds and flu; and mixed in soap, it is believed to offer low cost relief from malaria, skin diseases and even meningitis.

In 1994 the EPO granted European Patent No. 0436257 to the US Corporation W.R. Grace and USDA for a method for controlling fungi on plants by the aid of hydrophobic extracted Neem oil. In 1995 a group of international NGOs and representatives of Indian farmers filed a legal opposition against the patent. They submitted evidence that the fungicidal effect of extracts of neem seeds had been known and used for centuries in Indian agricultural to protect crops, and thus was the invention claimed in EP257 was not novel. In 1999 the EPO determined that according to the evidence all features of the present claim have been disclosed to the public prior to the patent application and [the patent] was considered not to involve an inventive step. The patent was revoked by the EPO in 2000.

Ayahuasca

For generations, Shamans of indigenous tribes throughout the Amazon Basin have processed the bark of *Banisteriopsis caapi* to produce a ceremonial drink known as "ayahuasca". The Shamans use ayahuasca which means vine of the soul, in religious and healing ceremonies to diagnose and treat illnesses, meet with spirits, and divine the future. An American, Loren Miller obtained US Plant Patent 5,751 in June 1986, granting him rights over an alleged variety of *B. caapi* he had called "*Da Vine*". The patent description stated that the plant was discovered growing in a domestic garden in the Amazon rain-forest of South America. The patentee claimed that *Da Vine* represented a new and distinct variety of *B. caapi*, primarily because of the flower colour.

The Coordinating Body of Indigenous Organizations of the Amazon Basin (COICA) – an organisation representing over 400 indigenous groups – learned of the patent in 1994. On their behalf the Centre for International Environmental Law (CIEL) filed a re-examination request on the patent. CIEL protested that a review of the prior art revealed that *Da Vine* was neither new nor distinct. They argued also that the granting of the patent would be contrary to the public and morality aspects of the Patent Act because of the sacred nature of *Banisteriopsis caapi* throughout the Amazon region. Extensive, new prior art was presented by CIEL, and in November 1999, the USPTO rejected the patent claim agreeing that *Da Vine* was not distinguishable from the prior art presented by CIEL and therefore the patent should never have been issued. However, further arguments by the patentee persuaded the USPTO to reverse its decision and announce in early 2001 that the patent should stand.

Hoodia Cactus

The San, who live around the Kalahari Desert in southern Africa, have traditionally eaten the Hoodia cactus to stave off hunger and thirst on long hunting trips. In 1937, a Dutch anthropologist studying the San noted this use of Hoodia. Scientists at the South African Council for Scientific and Industrial Research (CSIR) only recently found his report and began studying the plant.

In 1995 CSIR patented Hoodia's appetite-suppressing element (P57). In 1997 they licensed P57 to the UK biotech company, Phytopharm. In 1998, the pharmaceutical company Pfizer acquired the rights to develop and market P57 as a potential slimming drug and cure for obesity (a market worth more than £6 billion), from Phytopharm for up to \$32 million in royalty and milestone payments.

On hearing of possible exploitation of their traditional knowledge, the San People threatened legal action against the CSIR on grounds of "biopiracy." They claimed that their traditional knowledge had been stolen, and CSIR had failed to comply with the rules of the Convention on Biodiversity, which requires the prior informed consent of all stakeholders, including the original discoverers and users.

In March 2002, an understanding was reached between the CSIR and the San whereby the San, recognised as the custodians of traditional knowledge associated with the Hoodia plant, will receive a share of any future royalties. Although the San are likely to receive only a very small percentage of eventual sales, the potential size of the market means that the sum involved could still be substantial.

These examples suggest that some methods need to be evolved to check Biopiracy. In fact some methods have already been evolved to check Biopiracy and to compensate the original TK holders. One example in this regard is the agreement between Costa Rica and *Merck*, *Merck* obtained a monopoly right to bioprospecting in Costa Rica for an annual fee of \$ 568,000 with a promise of 50 percent royalty share in any marketable product developed.

In the case of the Arogyapachha fruit (*Trichopus Zeylanicus*) used by the Kani community in India for its anti-fatigue effects, the plant came to the attention of a scientific expedition in 1987 and was found to activate the body's natural defenses by acting on the cellular immune system with hepato-protective, anti-peptic ulcer and cholorectic effects. The drug "Jeevani" developed from this herb was patented by Kerala's Tropical Botanic Gardens

Research Institute as contemporary knowledge and the Kani community rewarded with a 50 percent share in royalties through a trust fund together with remuneration for participation in its expanded cultivation and development. This brought prosperity to the Kani community and raised their income by an average of about Euro 200 per month for every household.

Legal Framework To Safeguard The Rights Of Traditional Knowledge Holders

TK protection involves important policy issues beyond the domain of IP. This is a brief overview of the work undertaken by various international bodies and processes.

Convention on Biological Diversity (CBD)

The Convention, which was agreed in 1992, seeks to promote the conservation of biodiversity and the equitable sharing of benefits arising out of the utilisation of genetic resources.

Article 10 (c) may constitute a more powerful assertion of rights than Article 8 (j). It requires parties to protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements.

- Concluded in 1994, the *UN Convention to Combat Desertification (UNCCD)* provided for the protection of traditional knowledge in the ecological environment as well as the sharing of benefits arising from any commercial utilization of this TK.
- In 1978, the World Health Organization (WHO) first recognized the relevance of traditional medicine as a source of primary health care in the *Primary Health Care Declaration of Alma Ata*.
- In 2000, the United Nations Conference on Development (UNCTAD) in its Plan of Action stressed the importance of studying ways to protect traditional knowledge,
- The *United Nations Development Programme (UNDP)* conducts extensive capacity building work on TK, including on aspects of legal protection and equitable benefit- sharing negotiations,
- The FAO Conference adopted the *International Treaty on Plant Genetic Resources for Food and Agriculture* which provides in Part III for the recognition of farmers' rights, including the protection of traditional knowledge relevant to plant genetic resources for food and agriculture.
- During 1998 and 1999 WIPO conducted *fact-finding missions* in 28 countries in order to identify the IP- related needs and expectations of traditional knowledge holders.

- *In late 2000, the WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore was established.*
- The *International Union for the Protection of New Varieties of Plants (UPOV) Convention* provides a *sui generis* form of IP protection specifically adapted for plant breeding, with the aim of encouraging the development of new plant varieties.

Use of Existing Intellectual Property Laws

Examples are emerging which illustrate how the current intellectual property system can be utilised to commercialise traditional knowledge or prevent its misuse.

Existing IP rights have been used in the following ways

Unfair Competition and Trade Practices Laws

These allow for action to be taken against false or misleading claims that a product is authentically indigenous, or has been produced or endorsed by, or otherwise associated with, a particular traditional community. *Patents*: When practitioners innovate within the traditional framework, they have been able to use the patent system to protect their innovations. For example, in 2001 China granted 3300 patents for innovations within the field of Traditional Chinese Medicine.

Copyright

The use of copyright protection in Canada to protect tradition-based creations including masks, totem poles and sound recordings of Aboriginal artists has also proved itself successful.

Distinctive signs (trademarks, collective marks, certification marks): The use of industrial designs to protect the external appearance of articles such as head dresses and carpets in Kazakhstan is a good example.

Trademarks

Traditional signs, symbols and terms associated with TK have been protected as marks, and have been safeguarded against third parties' claims of trade mark rights. For instance, the Seri people of Mexico, faced with competition from mass production, registered the *Arte Seri* trademark to protect authentic ironwood products that are produced by traditional methods from the *Olné tesota* tree.

Aboriginal and Torres Strait Islander artists in Australia have obtained a national certification trademark. Like any other trademark, this certification mark or Label of Authenticity is intended to help promote the marketing of their art and cultural products and deter the sale of products falsely claiming to be of Aboriginal origin.

Geographical Indications

The use of geographical indications to protect traditional products such as liquors, sauces and teas in Venezuela and Vietnam is another example of this kind.

The Law of Confidentiality And Trade Secrets

This has been used to protect non-disclosed TK, including secret and sacred TK. Customary laws of communities often require that certain knowledge be disclosed only to certain recipients. Courts have awarded remedies for breach of confidence when such customary laws are violated. A group of North American indigenous communities, the Tulalip Tribes, have developed Story base, a digital collection of their TK. Some of the TK may be disclosed for patent review. Community leaders identify other information as for use exclusively within the Tulalip community, according to customary law; the latter is protected as undisclosed information.

In some communities and countries, the judgment has been made that even adaptations of existing IP rights systems are not sufficient to cater to the holistic and unique character of TK subject-matter. This has led to the decision to protect TK through *sui generis* rights. A number of countries have adapted existing intellectual property systems to the needs of TK holders through *sui generis* measures for TK protection.

Suggestions

- The collective management systems for protecting individual IP of traditional knowledge holders and grassroots innovators must be institutionalised so as to make IP system accessible to large number of people.
- Protection of Geographical Indications should be expanded for other products of interest to developing countries, as this is a good means of protecting both specific instances of TK but also the other constituent elements of the local communities and environment from where this TK originates.
- For protection of plant varieties bred by small farmers and local communities, they should not be required to provide data needed by the plant variety authority because of their inability to generate such data. Authority should get such data generated at their cost.
- Participation of TK holders in international/national IP rule making processes is essential for their legitimacy. So the government should facilitate help TK holders so that may represent themselves in an organized manner.
- WIPO should hold more consultations at the local, national, regional levels to develop for practical improvements of existing IP systems or for new IP systems.

- Local language databases of patent information must be created.
- Benefit sharing and ‘Prior Informed Consent’ mechanisms should reflect local values and the views of local stakeholders as to what is appropriate.
- All countries should provide in their legislation for the obligatory disclosure of information in the patent application of the geographical source of genetic resources from which the invention is derived.

Conclusion

It may be concluded that a single solution can hardly be expected to meet such a wide range of concerns and objectives. The type of measures required to prevent misappropriation may not be the same, indeed may not be compatible, with those needed to encourage the wider use of traditional knowledge. A multiplicity of complementary measures will almost certainly be required, many of which will be outside the field of intellectual property.

It has rightly been observed that if indigenous communities are the nurseries for the care and feeding of traditional knowledge, science parks are the nurseries where discoveries are confirmed and inventions made with more advanced tools. There is no reason to provide incentives only to science park communities and not to indigenous communities but recognized forms of incorporated collective identities represented in science parks have no equivalent in forms of collective and communal expression.

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