

treaty. The design would then be protected in all the member countries unless specifically refused. The international procedure under this treaty also lessens the work of offices of States party to the said treaty and also helps them obtain revenues from it.

The WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT) were adopted at the end of 1996, to provide solutions to certain problems arising out of economic, social, cultural and technological developments, particularly in the information and communication fields. As of October 15, 2003, the WCT and the WPPT had 42 States each as members. Adherence to these treaties, also referred to as the Internet Treaties, would foster creation and use of literary, artistic and musical works, as well as the production and use of performances and phonograms. It will eventually assist national economic development strategies in respect of their export orientation.

Intellectual property protection is an important determinant of economic growth. It also helps enterprises to recover the costs of their innovation expenses. The intellectual property systems must be so developed that they bring in socio-economic well-being. It bears repetition to emphasise that for this purpose it is necessary for countries to accept the challenge of constantly upgrading their national intellectual property systems, both legislative and infrastructural, to increase the opportunity for transfer of first grade technology and also for developing competitiveness in the national and international market. New methodologies need to be constantly devised and updated to help users in obtaining, maintaining, exploiting and enforcing intellectual property rights.

CHAPTER FOUR

PROTECTION OF CULTURAL HERITAGE, BIODIVERSITY, TRADITIONAL KNOWLEDGE AND PRACTICES, FOLKLORE AND SUSTAINABLE SOCIO-ECONOMIC DEVELOPMENT

- *Incentives and Rewards for Protection of Intellectual Property*
- *Interface with the Intellectual Property System*

4.1 THE NATURE OF TRADITIONAL KNOWLEDGE

The role of traditional knowledge with its spiritual, cultural and economic values is being increasingly recognised today. Such knowledge has been used for centuries by indigenous and local communities under local laws, customs and traditions. Such knowledge encompasses the totality of all knowledge and practices, whether explicit or implicit, used in diverse facets of life. This knowledge, which is the result of community's cooperative effort, is built on the foundation of past experiences and observations. The products based on traditional knowledge are important sources of income, food and healthcare for large parts of the population in developing countries in particular, and, in turn, for their sustainable socio-economic development.

Traditional knowledge evolves over a period of time by contributions of members of a particular society. Modified, enlarged and enriched, it becomes a valuable knowledge for the particular society since it is tested through use over a period of time. It is generally an attribute of a community intimately linked to a particular socio-ecological context through various economic, cultural and spiritual activities. What makes traditional knowledge 'traditional' is not its antiquity, but the way it is acquired and used. In other words, the social process of learning and sharing knowledge, which is unique to each culture, lies at the very heart of its traditionality.

Traditional knowledge is not static. It is inherently dynamic, as it evolves in response to challenges posed by the environment. The changing social environment alters its form and content; thus, it is subject to a continuous process of verification, adaptation and creation. Traditional knowledge encompasses the entire field of human endeavour. It includes a broad range of subject matters such as agricultural, scientific, technical, ecological, medicinal and biodiversity-related knowledge; expressions of folklore in the form of music, dance, song, handicrafts, designs, stories, and artwork; elements of languages, such as names, geographical indications, and symbols; and movable cultural properties.¹

¹ "Protection of Traditional Knowledge: Global Intellectual Property Issue," WIPO/UNESCO Conference on Intellectual Property, Baku, May 21-23, 2001, WIPO/UNESCO IP BAK 01 INF.4.

Western societies, in general, had not recognised any significant value of traditional knowledge. They had also not recognised the obligations associated with its use. These societies, in the context of their standard intellectual property laws, also looked at traditional knowledge as information in the ‘public domain,’ which was freely available for use by anybody. The concept of any compensation to the creators and possessors of traditional knowledge also did not exist. It is only recently that western science has become more interested in traditional knowledge. They are beginning to see that traditional knowledge, in combination with modern scientific knowledge, can lead to the solution of current problems in diverse areas – ranging from agriculture to health.

This chapter analyses the incentives and rewards for protection of intellectual property and the interface of traditional knowledge with the intellectual property system.

4.1.1 Folklore

The expressions of folklore are understood as productions consisting of characteristic elements of the traditional artistic heritage developed by a community, reflecting the traditional artistic expectations of such a community. The forms of expressions of folklore include folk tales, folk poetry and riddles; folk songs and instrumental music; folk dances, plays and artistic forms of rituals; and drawings, paintings, carvings, sculptures, pottery, mosaic, woodwork, metalware, jewelry, basket weaving, needlework, textiles, carpets, costumes, musical instruments and architectural forms.

4.1.2 Cultural Heritage

Broadly, the cultural heritage of a nation includes folklore, ethnographic material, such as products of pharmacopoeia, traditional medicine and psychotherapy. The cultural heritage also includes historic monuments and groups of buildings and sites.

Monuments comprise architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features.

The groups of buildings comprise groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science.

The sites comprise works of man or the combined works of nature and man, and areas including archaeological sites, which are of outstanding universal value from the historical, aesthetic, ethological or anthropological point of view.²

The heritage of indigenous people represents all moveable property and includes all kinds of literary and artistic works such as music, dance, song, ceremonies, symbols and designs, narratives and poetry; all kinds of scientific, agricultural, technical and ecological

knowledge, medicines and rational use of flora and fauna; immovable cultural property such as sacred sites, sites of historical significance, and documentation of indigenous peoples’ heritage on film, photographs, videotape or audiotape.

4.1.3 Biodiversity

Biodiversity includes the variability amongst living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity between species and of ecosystems. The vast majority of plant genetic resources and other forms of biodiversity is largely found in, or originates from developing countries. Access to these resources and associated traditional knowledge has the potential to create substantial benefits for scientific research centres and companies in both developed and developing countries.

4.1.4 Traditional Medicines

The World Health Organization (WHO) defines traditional medicine (TM) as the sum total of all the knowledge and practices, whether explicable or not, used in diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observations handed down from generation to generation, whether verbally or in writing. Healthcare providers worldwide are incorporating many of these into their mainstream activities. Traditional medicine is largely based on medicinal plants, indigenous to those countries where the system has been in vogue for several centuries. The effort is on accessing them either directly or through the use of modern tools of breeding and cultivation, including tissue culture, cell culture and transgenic technology. Intellectual property issues linked to such endeavours are beginning to be debated more widely now.

The protection of TM under intellectual property rights (IPRs) raises two types of issues. First, to what extent it is feasible to protect it under the existing IPR system. Certain aspects of TM may be covered by patents or other IPRs. There have also been many proposals to develop *sui generis* systems of protection. Such proposals are based on the logic that if inventors and innovators in the ‘formal’ system of innovation receive a compensation through IPRs, holders of traditional knowledge should be similarly treated.

The World Intellectual Property Organization (WIPO) has also been sensitive to these concerns. At a conference held in India in October 1998, under the aegis of WIPO, an agenda for the future of IPRs in the field of traditional medicines was prepared, which prioritised activities in this area, namely, development of standards for the availability, scope and use of IPRs in traditional medicine in Asian countries, systematic documentation of traditional medicine for protection purposes, regional and inter-regional information exchange and compilation of the requisite databases, etc.

The codification of traditional medicine varies significantly. A distinction can be made, particularly in Asia, between the codified systems of traditional medicine and non-codified medicinal knowledge, which includes folk, tribal or indigenous medicine. In India, for

² Cf. http://whc.unesco.org/world_he.htm.

example, folk traditions are passed on orally from generation to generation. Folk medicine has emerged from traditional beliefs, norms and practices based on centuries-old experiences of trials and errors, successes and failures at the household level. These are passed through oral tradition and may be called, people's healthcare culture, home remedies or folk remedies. Knowledge of TM may be possessed by individuals. In some cases, for instance, healers use rituals as part of their traditional healing methods, which often allow them to monopolise their knowledge, despite disclosure of the phytochemical products or techniques used. The codified tradition consists of medical knowledge with sophisticated foundations, expressed in thousands of manuscripts covering all branches of medicine. Examples are Ayurveda, Siddha, Unani and the Tibetan tradition.

Traditional medicine plays a crucial role in healthcare and serves the health needs of a vast majority of people in developing countries. Though the traditional healer provides a mixture of herbs to cure a malady, the healer may not know the exact mechanism of action of the drug molecule on the body in terms of biochemistry, but the healer relies on the human experience of using these products, which have evolved over several generations. Access to modern healthcare services and medicine may be limited in some developing countries. Traditional medicine becomes the only affordable treatment available to poorer segments of people, especially those in remote communities. A WHO study estimates that the vast majority of the population in most of the non-industrialised countries still rely on traditional forms of medicine for everyday healthcare. Plants used for medicinal purposes also often have a symbolic value for the community. Medicinal plants and, to a lesser but important extent, animal products, form the '*materia medica*' of these traditions. Other tradition-based creations, such as expressions of folklore, have at the same time taken on new economic and cultural significance within a globalised information society.

4.2 TRADITIONAL KNOWLEDGE PROTECTION AND PROMOTION: STRATEGIES

The issue of protection of traditional knowledge needs to be looked at from two perspectives. The protection may be granted to exclude the unauthorised use by third parties of the protected traditional knowledge. On the other hand, the protection may also mean the preservation of traditional knowledge from uses that may erode it or negatively affect the life or culture of the communities that have developed and applied it. Protection of traditional knowledge is a necessary but not sufficient requirement for its preservation and further development. In fact, the Global Knowledge Conference in 1997 emphasised the urgent need to learn, preserve and exchange traditional knowledge and encourage its role in local and national development.³

Some of the objectives of protection of traditional knowledge are briefly enumerated below, and are designed to:

- Preserve and conserve traditional knowledge

³ Cf. www.worldbank.org/afrik.

- Increase awareness of the value of traditional knowledge among traditional knowledge holders and others
- Enable communities to continue using traditional knowledge in the context of their traditional life styles
- Prevent the unauthorised use of traditional knowledge
- Encourage traditional knowledge-based innovations
- Commercialise certain types of traditional knowledge
- Equitably share the benefits arising from the commercial use of traditional knowledge
- Control and monitor access to traditional knowledge for varying purposes, including research, commercial applications, or use by other traditional communities
- Encourage the conservation and sustainable use of biodiversity
- Promote social justice and equity
- Recognise traditional customary laws and practices
- Guarantee the participation of local and indigenous communities in the policy and decision-making processes related to traditional knowledge
- Recognise the important role of women as holders of traditional knowledge and to ensure their participation in decision and policy-making processes.

One of the concerns of the developing world is that the process of globalisation is sometimes seen as appropriating the elements of the collective knowledge of societies into proprietary knowledge for the commercial benefit of a few. Developing countries need assistance to build national capacities in terms of raising awareness on the importance and potential of traditional knowledge for development. Action is needed to protect these knowledge systems through national policies and international understanding linked to intellectual property rights, while providing for its development and proper use as community knowledge and community innovation.

The local communities or individuals do not have the knowledge or the means to safeguard their property in a system which has its origin in very different cultural values and attitudes. The communities have a storehouse of knowledge about their flora and fauna – their habits, their habitats, their seasonal behaviour and the like – and it is only logical and in consonance with natural justice that they are given a greater say, as a matter of right, in the study, extraction and commercialisation of the biodiversity. A policy that does not obstruct the advancement of knowledge, and provides for valid and sustainable use and adequate intellectual property protection with just benefit sharing, is what the world needs.

The issues of the economics of community knowledge are truly complex. While it is true that many indigenous cultures appear to develop and transmit knowledge from generation to generation within a system, individuals in local or indigenous communities can distinguish themselves as informal creators or innovators, separate from the community. Furthermore, reportedly, some indigenous or traditional societies recognise various types of intellectual property rights over knowledge, which may be held by individuals, families, lineages or communities. Discussion of intellectual property rights and traditional knowledge should draw more on the diversity and creativity of indigenous approaches to IPR issues.

To quote Professor Carlos Correa's 'Discussion Paper' of November 2001, "Several proposals have been made, within and outside the IPR system, to protect traditional knowledge (TK). . . The possibility of applying the existing modes of IPRs protection to different components of TK has been extensively explored . . . Some elements of traditional medicine may be protected under patents . . . However, since most of the TK is not contemporary and has been used for long periods, the novelty and/or inventive step requirements of patent protection may be difficult to meet. It would be easier to comply with a more flexible novelty requirement such as that for plant varieties in UPOV for plant varieties that had been previously commercialised or disposed of for purposes of exploitation . . . Some valuable TK may be kept secret, such as in cases of applications of plants for therapeutic purposes. Holders of this knowledge may be protected against disclosure under unfair competition rules . . . Geographical indications may, in some cases, be a suitable mechanism to enhance the value of agriculture products, handicrafts and other TK – derived products . . . Copyright can be used to protect the artistic manifestations of TK holders, especially artists who belong to indigenous and native communities, against unauthorised reproduction and exploitation . . . Another approach . . . would be the development of a *sui generis* regime of IPRs . . . which is specifically adapted to the nature and characteristics of TK. Although this approach has received considerable attention . . . little progress has been made in terms of actually implementing this kind of protection."⁴

While recognising the market-based nature of IPRs, other non-market-based rights could be useful in developing models for protecting traditional knowledge, innovations and practices. To date, debate on IPRs and biodiversity has focussed on patents and plant breeders' rights. Provisions concerning undisclosed information or trade secrets could be invoked to protect traditional knowledge not available in the public domain. Geographical indications and trademarks, or *sui generis* analogies, could also be the alternative tools for indigenous and local communities seeking to gain economic benefits from their traditional knowledge. The potential value of geographical indications and trademarks is in protecting plants and germplasms that are specific and unique to geographical regions. They could protect and reward traditions while allowing innovation. They will emphasise the relationships between human cultures and their local land and environment. They are not freely transferable from one owner to another. They can be maintained as long as the collective tradition is maintained.

4.3 INTELLECTUAL PROPERTY RIGHTS AND TRADITIONAL KNOWLEDGE

Environmental NGOs, anthropologists and the Convention on Biological Diversity (CBD) have addressed these issues linked to traditional knowledge in a holistic manner. The CBD's large and diverse constituency open to NGOs has provided an

intergovernmental forum where these issues are being debated with a certain measure of coherence.

Two extreme views have surfaced in the debates in the CBD and other fora. One view advocates the extension of intellectual property protection to cover traditional knowledge and the other view promotes the *status quo* where such knowledge is treated as a public good. Those who are in favour of the first view argue that extending intellectual property protection to traditional knowledge will in fact promote technological innovation, as it would facilitate the dissemination and development of that knowledge in the modern economic space. An example of how the intellectual property system can be utilised to commercialise traditional cultural property system or prevent its misuse is the way in which Aboriginal and Torres Strait Islander artists in Australia have obtained a national certification trademark which is intended to promote the marketing of their art and cultural products and deter the sale of products falsely claimed to be of aboriginal origin. Further, recognition of intellectual property rights in traditional knowledge could generate incentives amongst the indigenous communities in conserving and preserving their environment.

Also, the industrialised countries have a moral obligation to ensure that indigenous and local people receive a fair and equitable share of benefits arising from the use of their traditional knowledge and commercialisation of their genetic resources. The opportunity of exploiting traditional knowledge comes from interlinking and developing partnerships between local innovators and entrepreneurs on the one hand and by holders of traditional knowledge on the other.

The Honeybee Network in India, for example, works to protect the intellectual property rights of grassroots level innovators through the documentation and dissemination of their innovations via the said Network, and has compiled a database having around 10,000 entries. This activity is based on the fundamental belief that when peoples' knowledge is collected and recorded, they should not become poorer for sharing their insights, and for connecting innovators through the networking in local languages. If income is generated by developing people's knowledge, they must be rewarded with a fair share. Another example is in the People's Democratic Republic of Laos, where the government established the Traditional Medicines Resource Centre (TMRC), which is working with the local healers to document details of all traditional medicines with a view to promoting a practice of mutually beneficial sharing. The TMRC is also collaborating with the International Cooperative Biodiversity Group (ICBG) in efforts to discover prospective medicinal products. Any benefits, profits or royalties realised from plants and knowledge recovered during the collaboration will be shared with all the involved communities.

Some opponents of the extension of intellectual property protection to traditional knowledge argue that such a move might destroy the social basis for generating and managing the knowledge. They argue that traditional knowledge being community property, passed on from one generation to the next, it would be privatised through protection under intellectual property law, and this may deny access to such knowledge.⁵

⁴ Cf. Discussion paper entitled "Traditional Knowledge and Intellectual Property" by Carlos M. Correa, Professor of Intellectual Property Law and Director of the University of Buenos Aires' Masters Programme on Science and Technology Policy and Management, and more recently member of the U.K. Government's Commission on Intellectual Property Rights (CIPR). The said discussion paper was published in November 2001 by Quaker United Nations Office (QUNO), Geneva, Switzerland.

⁵ J. Mugabe, "Intellectual Property Protection and Traditional Knowledge: An Exploration in International Policy Discourse," Paper prepared for WIPO, Geneva, December 1998.

Intellectual property rights provide an incentive to turn knowledge into a marketable commodity and to commercialise it. Mere preserving of such knowledge in its cultural context, although laudable, does not serve a wider public good. There is a school of thought, however, that feels that ethnobotanical knowledge by its very nature is integrative, holistic and synergistic, and is most meaningful in the place where the plants exist. It must be seen in the ecological and cultural context in which they have grown, and are managed, and used by local residents. Intellectual property rights protection provides values to the specified properties of plants that can most easily be taken out of their natural and cultural context, and replicated through artificial selection in a laboratory or a greenhouse. This provides a potential to use these for a wider possible public good, rather than confining them locally.

Indeed, traditional knowledge has been increasingly used for providing the 'technical lead' in biodiversity prospecting. A number of pharmaceutical companies rely on traditional knowledge of indigenous and local people in their screening activities for identifying the biologically active constituents which have potential commercial market. While doing so, the rights of these people have been ignored. Indigenous and local people have not shared, at least in a fair and equitable manner, the benefits arising from the appropriation of their knowledge and its subsequent use in drug development. Though it is fully recognised that there is a need to protect traditional knowledge, and to secure a fair and equitable sharing derived from the use of biodiversity and associated traditional knowledge, there is no agreement per se on what would be the most appropriate and effective way of achieving these objectives.

4.4 LOSS OF TRADITIONAL KNOWLEDGE

There is a growing concern about the increasing loss of plant and animal species as well as destruction of habitats, as also the loss of knowledge concerning these. For example, such a loss takes place in many different ways. These include destruction of ecosystems in search for expanded agricultural lands, deforestation associated with harvesting of timber and other forest products, over emphasis on oral traditions, lack of documentation and appropriation of traditional knowledge with no rewards for the holders of that knowledge and also extinction of some of the groups possessing this knowledge. For example modest estimates show that about 85 Brazilian Indian groups became extinct in the first half of the 20th century. In the Amazonian region, on an average, one Amerind group is estimated to have disappeared during each year of the 20th century.

Loss of traditional knowledge also could be due to the advent of new technologies. In India, for example, the Bhotiya tribe inhabiting higher altitudes in Garhwal Himalayas, traditionally dyed their wool using herbal dyes, which were available in their vicinity. These dyes were fast and cheap. But with the development of road network in the formerly inaccessible areas, synthetic dyes from the markets of the Punjab, became easily available to the Bhotiya community, at much cheaper rates. Thus the availability of synthetic dyes brought the traditional wool dyeing technique to the verge of extinction.

4.5 BIOPIRACY OF TRADITIONAL KNOWLEDGE

The grant of patents on non-original innovations (particularly those linked to traditional medicines), which are based on what is already a part of the traditional knowledge in the developing world, has been causing great concern in these countries. Protection of traditional knowledge is a sensitive issue. Grant of wrong patents on knowledge that was already in the public domain has had two effects. Firstly, it has caused a heartburn amongst those who possessed this knowledge. Secondly, the challenges to such patents, and their subsequent revocation, have brought more clarity in this debate by identifying the real reasons for grant of such wrong patents and have, on a positive side, led to new initiatives, such as the creation of traditional knowledge digital libraries, and potential changes in the international patent classification systems. In the following, we will describe some of these cases.

4.5.1 Challenge to Patents Based on Traditional Knowledge

4.5.1.1 Turmeric (*Curcuma longa*)

The rhizomes of turmeric are used as a spice for flavouring in Indian cooking. Turmeric 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 expatriate Indians at the University of Mississippi Medical Centre (Suman K. Das and Hari Har P. Cohly) were granted a US patent (No.5,401,5041) on the use of turmeric in wound healing. The Council of Scientific & Industrial Research (CSIR) in India, filed a re-examination case with the United States Patent and Trademark Office (USPTO), challenging the patent on the basis of prior art. The CSIR argued that turmeric has been used for thousands of years for healing wounds and rashes and, therefore, its medicinal use was not a novel invention. Their claim was supported by documentary evidence of traditional knowledge, including a paper published in 1953 in the *Journal of the Indian Medical Association*. Despite an appeal by the patent holders, the Patent Office upheld the objections filed by the CSIR and revoked the patent in 1997, after ascertaining that there was no novelty, the findings reported by innovators having been known in India for centuries. The turmeric case was a landmark judgement as it was the first time that a patent based on the traditional knowledge of a developing country was successfully challenged.

4.5.1.2 Neem (*Azadirachta indica*)

Neem extracts can be used against hundreds of pests and fungal diseases that attack foodcrops; the oil extracted from its seeds can be used to cure cold and flu; and mixed in soap, it offers cheap relief from malaria, skin diseases and even meningitis. In 1994, the European Patent Office (EPO) granted a patent (EPO patent No.436257) to the US Corporation, W.R. Grace Company and US Department of Agriculture for a method of controlling fungi on plants through hydrophobically extracted *neem* oil. In 1995, a group of international NGOs and representatives of Indian farmers filed a legal petition against the patent. They submitted evidence that the fungicidal effect of extracts of *neem* seeds had been known and used for centuries in Indian agriculture to protect crops, and thus was a

prior art and unpatentable. In 1999, the EPO determined that according to the evidence all features of the present claim had been disclosed to the public prior to the patent application and thus the patent was not considered to involve an inventive step. The patent granted on *neem* was revoked by the European Patent Office (EPO) in May 2000.

4.5.1.3 *Basmati*

Rice Tec. Inc. had applied for registration of a mark "Texmati" before the UK Trademark Registry. It was successfully opposed by the Agricultural and Processed Food Exports Authority (APEEDA), India. One of the documents relied upon by Rice Tec as evidence in support of the Rice Tec Inc. was US patent 5,663,484 granted by the US Patent Office on September 2, 1997, and that is how this patent became an issue for contest.

This US utility patent claimed a rice plant having characteristics similar to the traditional Indian Basmati rice lines, and with the geographical delimitation covering North, Central or South America, or the Caribbean Islands. The patent had 20 claims covering not only the novel rice plant but also various rice lines; resulting plants and grains, seed deposit claims, method for selecting a rice plant for breeding and propagation. Its claims 15-17 were for a rice grain having characteristics similar to those of Indian Basmati rice lines. The said claims 15-17 would have come in the way of Indian exports to the U.S., if legally enforced.

Evidence from the Indian Agricultural Research Institute (IARI), New Delhi, *Bulletin* was used against claims 15-17. The evidence was backed up by the germplasm collection of the Directorate of Rice Research, Hyderabad, since 1978. The various grain characteristics were evaluated by Central Food Technological Research Institute (CFTRI) scientists and accordingly the claims 15-17 were opposed on the basis of the declarations submitted by CFTRI scientists on grain characteristics.

Eventually, a request for re-examination of this patent was filed on April 28, 2000. Soon after filing the re-examination request, Rice Tec chose to withdraw claims 15-17 along with claim 4.

The above are the examples of cases that were successfully contested. On the other hand, there are cases which have remained unresolved, or in which the concerned patent offices have not agreed with the claims of the challenges, and have not revoked the patents. Some examples of these cases are given below:

4.5.1.4 *Kava (Piper mytheisticum)*

Kava is an important cash crop in the Pacific, where it is highly valued as the source of the ceremonial beverage of the same name. Over 100 varieties of kava are grown in the Pacific, especially in Fiji and Vanuatu, where it was first domesticated thousands of years ago. In North America and Europe, kava is now promoted for a variety of uses. The French company L'Oreal has patented the use of kava to reduce hair loss and stimulate hair growth.

4.5.1.5 *Ayahuasca (Banisteriopsis caapi)*

For generations, Shamans of indigenous tribes throughout the Amazon basin have processed the bark of *B. caapi* to produce a ceremonial drink known as "ayahuasca."

The Shamans use ayahuasca (which means "wine of the soul") in religious and healing ceremonies to diagnose and treat illness, meet with spirits, and divine the future.

An American national, Loren Miller, obtained a US Plant Patent (No. 5,751 issued in 1986), granting him rights over an alleged variety of *B. caapi* which he had collected from a domestic garden in Amazon and had called "Da Vine," and was analyzing it for potential medicinal properties. The patent claimed that Da Vine represented a new and distinct variety of *B. caapi*, primarily because of the flower colour.

The Coordinating Body of Indigenous Organisations of the Amazon Basin (COICA), which represents more than 400 indigenous tribes in the Amazon region, along with others, protested against the wrong patent that was given on a plant species called *B. caapi*. They protested that ayahuasca had been known to be native to the Amazon rainforest, and cultivated for generations for its traditional medicinal uses, so Loren Miller could not have discovered it, and should not have been granted such rights, which in effect, appropriated indigenous traditional knowledge. On re-examination, the USPTO revoked this patent on 3rd November 1999. However, the inventor (Loren Miller) was able to convince the USPTO on 17th April, 2001, and the original claims were re-confirmed and the patent rights restored to the innovator.

4.5.1.6 *Quinoa (Chenopodium quinoa)*

Quinoa is a staple food crop for millions in the Andes, especially Quechua and Aymara people who have bred a multitude of quinoa varieties. One traditional quinoa variety, Apelawa, is the subject of the US patent No. 5,304,718 held by two Professors from the Colorado State University who claim the variety's male sterile cytoplasm is key to developing hybrid quinoa.

To cite some more examples, the plant *Phyllanthus amarus* is used for Ayurvedic treatment for jaundice. A US patent has been taken for its use against hepatitis B. The plant *Piper nigrum* is used for Ayurvedic treatment for vitiligo (a skin pigmentation disorder). A patent has been granted in the UK for the application of a molecule from *Piper nigrum* for use in treatment of vitiligo.

4.5.2 *Successful Cases of Benefit Sharing*

In contrast to the above two categories, where patents were either revoked or not revoked, but the holders of knowledge did not get involved in any financial transactions, there are cases, where the originators of knowledge did get a benefit. Such an interesting case is discussed below.

4.5.2.1 *Hoodia (Hoodia gordonii)*

For thousands of years, African tribesmen have eaten the Hoodia cactus to stave off hunger and thirst on long hunting trips. The Kung bushmen, San, who live around the Kalahari desert in southern Africa used to cut off a stem of the cactus about the size of a cucumber

and munch on it over a couple of days. According to tradition, they ate together so they brought back what they caught and did not eat while hunting.

In 1995, the South African Council of Scientific and Industrial Research patented Hoodia's appetite-suppressing element (P57) and hence, its potential cure for obesity. In 1997, they licensed P57 to British Biotech Company, Phytopharm. In 1998, 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 \$ 32 million. The San people eventually learned of this exploitation of their traditional knowledge, and in June 2001, launched legal action against the South African Council of Scientific and Industrial Research and the pharmaceutical industry on grounds of biopiracy. They claimed that their traditional knowledge had been stolen, and the South African Council of Scientific and Industrial Research had failed to comply with the rules of the CBD, which require the prior informed consent of all stakeholders, including the original discoverers and users.

Phytopharm claimed to have conducted extensive enquiries but were unable to find any of the traditional knowledge holders. The remaining San were apparently at the time living in a tented camp away from their tribal lands. The South African Council of Scientific and Industrial Research claimed that they had planned to inform the San of the research and share the benefits, but wanted to make sure that the drug proved successful.

The two sides entered into negotiations for a benefit-sharing agreement, despite complications regarding as to who should be compensated, that is, the persons who originally shared the information, their descendants, the tribe, or the entire country. The San are nomads spread across four countries.

However, in March 2002, a landmark agreement was reached according to which the San will receive a share of any future royalties. The settlement will not directly affect Phytopharm or Pfizer since the San would be paid out of the royalties that would be received by the South African Council of Scientific and Industrial Research, as the latter was the patent holder. The South African Council will probably receive a royalty of around 10% from Phytopharm, which itself will receive royalties from sales by Pfizer. Thus, San are likely to end up with only a very small percentage of eventual sales.

4.5.2.2 Need for Concerted Action

The appropriation of elements of this collective knowledge of societies into proprietary knowledge for the commercial profit of a few is one of the concerns of the developing world. Urgent action is needed to protect these fragile knowledge systems through national policies and international understanding linked to IPRs, while providing for the development and proper use of the knowledge for the benefit of its holders. While focussing on safeguarding community knowledge, efforts should be made to enhance community innovation, enterprise and investment.

The local communities or individuals do not have the knowledge or the means to safeguard their property in a system which has its origin in very different cultural values and attitudes. The communities have a storehouse of knowledge about their flora and fauna, their habits, their habitats, their seasonal behaviour and the like, and it is only

logical and in consonance with natural justice that they are given a greater say in all matters regarding the study, extraction and commercialisation of the biodiversity. A policy is needed which does not obstruct the advancement of knowledge, and provides for valid and sustainable use and adequate intellectual property protection, with just benefit sharing.

In February 2002, the following countries, viz., China, Brazil, India, Indonesia, Costa Rica, Colombia, Ecuador, Kenya, Peru, Venezuela and South Africa, which are rich in biodiversity, formed an alliance to fight biopiracy and press for rules protecting their people's rights to genetic resources found on their land.

4.6 USE OF TRADITIONAL KNOWLEDGE FOR CREATING MARKETABLE PRODUCTS

It has been realised that natural products are sources of new biochemical compounds for drug, chemical and agro-products development.⁶ These have been exploited by the biotechnology, pharmaceutical and human healthcare industries. It has been estimated that the present world market of 60 billion dollars on herbal products is expected to grow to over 5 trillion dollars by the year 2020. The biological diversity comprising the plants and animals from tropical countries is worth more than £ 20 billion a year to major pharmaceutical companies and unfortunately very little money has gone back to the developing world. Exploiting the treasure of biological diversity has led to the resurgence of interest in traditional knowledge and medicine. This interest has been stimulated by the importance of traditional knowledge as a lead in new product development. Of the 119 drugs developed from higher plants, on the world market today, an estimated 74% were discovered from a pool of traditional herbal medicine.⁷ In 1990, Posey estimated that the annual world market for medicines derived from medicinal plants the knowledge of which was gained from indigenous peoples amounted to US\$ 43 billion.

Developing countries and their traditional communities have contributed considerably to the global pharmaceutical industry. For example, Okoth-Owiro and Juma have estimated that plant-derived prescription drugs in the United States of America originate from 40 species of which 50% are from the tropics. The 20 species generate about US\$ 4 billion for the US economy.⁸ The commercial exploitation of these plants has been accompanied by appropriation of traditional knowledge. To cite an example, in the 1970s the US National Cancer Institute (NCI) invested in large scale collection of *Maytenus buchananii* from Simba Hills of Kenya. The lead for the collection came from the knowledge of the Digo communities – indigenous of the Simba Hills area – who use the plant to treat cancerous conditions.⁹ The plant contains a biologically active constituent maytansine, which is considered a potential treatment for pancreatic cancer. The collected material was traded without the consent of the Digo community. Their knowledge of the plant and its medicinal properties was also not rewarded.

⁶ Cf. W. Reid *et al* 1993 as quoted in paper mentioned in footnote 5.

⁷ Cf. S. Laird, 1994.

⁸ Cf. A. Okoth-Owiro & C. Juma, 1996.

⁹ Cf. C. Juma, 1989.

Similarly, the NCI also collected another plant *Homalanthus nutans* from the Samoa rainforests, which contains an anti-HIV compound prostratin. This collection was undertaken on the basis of traditional knowledge.¹⁰ NCI has also benefitted from traditional knowledge of local communities living around Korup Forest Reserve in Cameroon, from where it collected *Ancistrocladus korropensis* to screen for an anti-HIV chemical, Michellamine B. The NCI and other drug research and development organisations have started investing considerable sums of money to prospect for plants containing useful chemicals, and are also investigating the efficacy of traditional medicines.

Some other examples provided by Naomi Roht-Arriaza for drug and cosmetic development based on traditional knowledge, include Eli Lilly extraction of the rosy periwinkle plant, and traditional knowledge from Madagascar and commercialisation of the resultant drug totalling US\$ 100 million with no returns to the local people.

Though the discovery of biologically active constituents and trade in medicinal plants from developing countries has increased in the past few decades, little if any benefits accrue to the source countries or the traditional communities. According to Iwu, total trade in herbal remedies and botanicals in 1995, yielded over US\$ 56 billion, and the only payments to the communities were for the manual labour involved.¹¹ According to Posey,¹² less than 0.001% of profits from drugs developed from natural products and traditional knowledge accrue to traditional people who provided technical leads for the research.

4.6.1 Cases of Benefit Sharing

One can cite some exceptions where a part of the benefit has percolated to the indigenous people. These include the Shaman Pharmaceuticals and the Body Shop. Shaman develops new therapeutics by working with indigenous peoples of tropical forests. The Body Shop is bioprospecting in the Kayapo area of Brazil extensively drawing on traditional knowledge of the Kayapo Indians. It has invested in ethnobotanical research for the development of new ingredients for its body-care products. The investment has proved to be a boon. In 1991, the Body Shop had at least 300 products with annual sales of US\$ 90 million. By 1995, its annual sales stood at least at US\$ 200 million.¹³

Another example of benefit sharing models for indigenous innovation relates to a medicine that is based on the active ingredient in a plant, *Trichopus zeylanicus*. Scientists at Tropical Botanic Gardens and Research Institute (TBGRI), Thiruvananthapuram, Kerala, India were on an expedition to areas inhabited by Kani tribals in 1987. Their interaction with the tribals led them to an observation of a plant that the tribals chewed to keep themselves energetic. They studied the properties of this plant by isolating and testing the active ingredients. They incorporated these ingredients into a product, which they christened

'Jeevani.' This product was shown to bolster the immune system. It was later found that it had immuno modulation hepato-protection as well as aphrodisiac properties. The development of this drug was entirely possible due to the indigenous knowledge of the Kani tribe residing in the Western Ghat forests in India. TBGRI, which is the sole patent holder, struck an agreement with the tribal community to share a license fee and 2% of net profits. This marks perhaps the first time that for indigenous knowledge held by a tribe, compensation in the form of cash benefits has gone directly to the source of the IP holders. Such examples need to be multiplied globally.

Shaman, the Body Shop, and Jeevani, have developed mechanisms of returning some of the benefits from the commercialisation of medicinal plants and traditional knowledge, to the local people. The Body Shop also sponsors projects to assist local people to establish enterprises for processing crude products.

In the interest of the developing countries requirements it may be worthwhile to ensure that living organisms and their parts are not patented; also that the rights of traditional farmers to use, exchange and save seeds be protected; and that the indigenous local farming community innovations are likewise protected.

4.7 PROTECTION OF TRADITIONAL KNOWLEDGE THROUGH DOCUMENTATION

Traditional knowledge documentation data constitute an important form of non-patent literature with specific characteristics making it a category of non-original databases. Some of those characteristics may necessitate specialised measures for traditional knowledge data to be adequately integrated and recognised as relevant non-patent literature and as a non-original database.

If the development of such measures takes into account the needs and priorities of all stakeholders, they might: (i) avoid the grant by IP offices of patents for traditional knowledge-based inventions which are not novel and non-obvious; (ii) avoid the costs of challenging such patents for traditional knowledge holders and other interested third parties; and (iii) facilitate recognition of the technological value of traditional knowledge by all users of non-patent literature, including IP offices, industry, researchers and the general public.

As mentioned earlier, the grant of patents on non-original innovations (linked to traditional medicines), which are either based on what is already a part of the traditional knowledge or a minor variation thereof, have been causing a great concern to the developing world. A recent study by an Indian expert group¹⁴ examined randomly selected 762 US patents, which were granted under A61K35 78 and other IPC classes, having a direct relationship with medicinal plants in terms of their full text. Out of these 762 patents, 374 (49%) were found to be based on traditional knowledge. The fact that 408 patents have been granted by USPTO in March 2000 alone on several medicinal plants implies that there is an extreme urgency in addressing the issue of patents on traditional systems of medicine. The Governments in the developing world as well as members of public are equally concerned about the grant of patents on traditional systems of medicine.

¹⁰ Cf. D. Posey & G. Dutfield 1996, References 7 to 10 as quoted in the paper mentioned in footnote 7.

¹¹ Cf. J. F. Ayafor, 1997 as quoted in the paper mentioned in footnote 7.

¹² Cf. D. Posey, "Intellectual Property Rights for Native Peoples: Challenges to Science, Business, and International Law." Paper prepared for the International Symposium on Property Rights, Biotechnology and Genetic Resources, Nairobi, Kenya, 1991.

¹³ *Op. cit.* footnote 5.

¹⁴ TKDL Task Force Findings: Indian Systems of Medicine and Homeopathy, March 2000.

Patent examiners, in such patent offices, that undertake substantive examination prior to grant of a patent, when considering the patentability of any claimed subject matter, use available resources for searching the appropriate non-patent literature sources. Patent literature, however, is usually wholly contained in several distinctive databases and can be more easily searched and retrieved than can be the non-patent literature prior art that may be buried somewhere in the many and diverse sources. Therefore, there is a need to create more easily accessible non-patent literature databases that deal with traditional knowledge. With the help of developing countries, traditional knowledge can be documented, captured electronically, and placed in the appropriate classification within the International Patent Classification (IPC) so that it can be more easily searched and retrieved. A traditional knowledge digital library (TKDL) would help to prevent patenting of products based on traditional knowledge.

Eventually, the creation of TKDL in the developing world would serve a bigger purpose in providing and enhancing its innovation capacity. It could integrate widely scattered and distributed references on the traditional knowledge systems of the developing world in a retrievable form. It could act as a bridge between the traditional and the modern knowledge systems. Availability of this knowledge in retrievable form in many languages will give a major impetus to modern research in the developing world, which would add further value to this traditional knowledge; an example being the development of an allopathic medicine based on a traditional plant-based therapeutic. Sustained efforts to modernise the traditional knowledge systems of the developing world will create higher awareness at national and international levels and will establish a scientific approach that will ensure higher acceptability of these systems practitioners of modern systems and public at large.

A Task Force consisting of members from USPTO, JPO, EPO, China and India was constituted by WIPO in the 30th meeting of the IPC Union (February 19–23, 2001) to look into the possibility of integrating or interlinking traditional knowledge resource classification (TKRC) into the IPC. In the 31st meeting of the IPC Union (February 25–March 1, 2002), the committee noted that the IPC, representing the worldwide system for classifying patent information, could also be successively applied for classifying non-patent documentation, such as traditional knowledge documentation. However, only a few entries in the IPC were available for classifying this subject matter, and substantial revision of the classification would be required in this regard, including creation of a new sub-class covering traditional knowledge subject matter.

Traditional Knowledge Resource Classification (TKRC) devised by India is a classification system for the purpose of systematic arrangement, dissemination and retrieval of traditional knowledge resources. It is expected to facilitate the digitisation of traditional knowledge and act as a meta library to provide a language-independent storage and retrieval of digitised information. This is devised by following the internationally well-accepted IPC structure which includes sections, classes, sub-classes, groups and sub-groups. TKRC needs to be integrated into the IPC, which has been widely accepted by patent authorities globally for classification and retrieval of information. Once TKRC is integrated into the IPC, it will offer a uniform acceptable solution, which will serve as an instrument for the orderly arrangement of documents relating to traditional medicinal plants and other traditional knowledge resources. It will serve as a basis for selective

dissemination of information on traditional resources to all users of non-patent information.

For documenting traditional knowledge, it will be necessary that TKRC gets accepted globally. TKRC relating to more than 2000 medicinal plants, information on processes for the preparation of the drugs and its uses, details of plants used, therapeutic compound formulations, compositions, doses and diseases in which they are used, along with the list of documents wherein such information is available, has already been completed by Indian experts. This classification will have to be enhanced at a global level.

India has taken an initiative to create a Traditional Knowledge Digital Library (TKDL). This is a collaborative project of the National Institute of Science Communication And Information Resources (NISCAIR, CSIR) and the Department of ISM&H and is being implemented at NISCAIR. Immediate target for TKDL is 35,000 formulations included as Slokas in the Ayurvedic texts which are in the public domain. Each Sloka will be transcribed in approximately four pages. Therefore, the portal will contain approximately 1,40,000 pages in a single language. One time cost on TKDL on Ayurveda has been estimated as US\$ 300,000.

Identification of priority medicinal plants was done by the experts of the Department of Indian Systems of Medicine and Homeopathy (ISM&H) and CSIR with the help of international patent databases.

Once the National Traditional Knowledge Digital Libraries get created, they may be included in the official list of International Search Authorities (ISA) relating to non-patent literature. Presently, there are 135 non-patent technical journals, in the lists of ISA. Once the TKDL by various member states get created and integrated with www.tkd.com, it will be useful for IP offices to review patents granted on non-original inventions which are part of the traditional knowledge systems. Revocation of such patents by IP offices will go a long way in addressing the emotive concerns of the developing world on the issue of IPR based on indigenous knowledge.

The IPC Union has decided to include about 200 sub-groups on medicinal plants in contrast to one sub-group A61K 35/17 available at present. In the 32nd IPC Union meeting held in WIPO, Geneva, in February 2003, it was decided that the Task Force should continue its work on further development of classification tools for TK and to investigate possible patent classification aspects relating to components of biodiversity and folklore. The Task Force is also supposed to consider how the future revised IPC could be linked to TKRC, which may be developed in various countries, and how to best organise access to TK documentation, which was in the public domain, including hyperlinking the IPC to TK databases. These developments augur well for integrating traditional knowledge into knowledge systems based on industrial systems.

4.8 TRADITIONAL RESOURCE RIGHTS (TRR)

Knowledge of traditional resources is central to the maintenance of identity of indigenous and local communities embodying traditional lifestyles. Therefore, control over these resources is of central concern in their struggle over land and territory. Effective links

between external forces and local communities are likely to be forged through the development of *sui generis* system(s) that must first protect indigenous and local communities and ensure their control over land, territory and resources before issues of access and transfer can be discussed. Equitable benefit sharing from the wider use and application of the knowledge, innovations and practices of indigenous people and local communities, as well as from use of the biological resources conserved on their lands and territories, can then be negotiated. Adequate and effective protection and benefit sharing mechanisms inevitably require a shift from economic or ecological-determined legal and political frameworks to a rights-driven system.

The term Traditional Resources Rights (TRR) has emerged to define the many “bundles of rights” that can be used for protection, compensation, and conservation. The change in terminology from IPR to TRR reflects an attempt to build on the concept of IPR protection and compensation, while recognising that traditional resources – both tangible and intangible – are also covered under a significant number of international agreements that can be used to form the basis for a *sui generis* system. “Traditional resources” include plants, animals, and other material objects that may have sacred, ceremonial, heritage, or aesthetic qualities. “Property” for indigenous peoples and local communities frequently has intangible, spiritual manifestations, and, although worthy of protection, can belong to no human being. Indigenous and traditional communities are increasingly involved in market economies, and are seeing an ever-growing number of their resources traded in those markets. Even so, for many, privatisation or commoditisation of their resources is not only foreign, but incomprehensible or even unthinkable.

4.8.1 The TRR Process

The TRR concept can be implemented by identifying guiding principles for legislative processes, and by forming the basis for practical instruments and mechanisms that guarantee protection, benefit sharing, and political and financial support for indigenous and local communities.

Governments now have a unique opportunity to support work in the development of a TRR-type *sui generis* system. By doing so they will be taking an important step towards synergising and harmonising their human rights commitments with biodiversity conservation, sustainable development and global trade agreements. Governments should also press for the establishment of an Ombudsman’s Office that would not only advise indigenous and local communities on the protection of their resource rights and on benefit sharing, but represent them in their complaints relating to infringements of their resource rights.

Governments could assist these processes by providing resources and expertise for the development of practical instruments (such as Material Transfer Agreements, Information Transfer Agreements, contracts and covenants) and mechanisms that embody TRR principles. Financial and political support for indigenous and local communities

can also be provided through new guidelines for policies and projects. To protect traditional resources all such projects and policies should be planned and implemented in collaboration with the affected indigenous and local communities. This may require the development of new guidelines and laws for defining and implementing with prior informed consent.