

# Periodic Research

## Legal Protection of Genetic Resources: Possibilities under Intellectual Property Rights

### Abstract

Protections of the Traditional Knowledge relating to genetic resources of the indigenous communities is one of the most contentious and complicated issue. This paper explores the possibilities of traditional and modern intellectual property rights in protecting biotechnological development in the field of genetic and living resources that is developed by traditional people by continuous interaction with surrounding environment.

**Keywords:** Traditional Knowledge, Genetic Resources, Living Resources, Biotechnology, Intellectual Property Rights.

### Introduction

Evolution of human life and culture has directly or indirectly been associated and influenced by the knowledge they have acquired by continuous interaction with the surrounding environment. The primitive people acquired the traditional knowledge related to genetic resources by trial and error method<sup>i</sup>. Traditional knowledge is said to be the wisdom developed by any people over many generations for proper utilisation of their land, natural resources and environment; it is reflected in their life styles innovations and practices.<sup>ii</sup> It excludes the knowledge acquired through formal school education and various channels of information like newspapers television, radio or internet, etc. Consequently, they become the huge store house of knowledge in many useful subjects relating to their life and livelihood. This knowledge was accumulated and enriched and passed on from one generation to another without any written document. This knowledge is fast vanishing and becoming the subject of misappropriation. The resurgence of knowledge systems and the thought about its legal protection is a contemporary global phenomenon.

The new millennium poses serious challenge to the international legal community to set new international legal standard for tackling the problem of intellectual property protection throw open by the technology developments. The historical development of the protection of intellectual property in the wake of individual private property rights, pushed, the traditional knowledge and the innovative practice based on it outside the purview of the formal intellectual property protection regime. Traditional Knowledge was treated as Knowledge in the public demans for free exploitation without showing any respect or concern for the effort taken by the communities to preserve and promote the same. The new technological developments, particularly in biotechnology, clearly demonstrate the significance and usefulness of traditional knowledge for the development of new product of commercial importance. The formal intellectual Knowledge base. The need to protect the traditional knowledge captured the attention of the international community only recently but the standard setting was left to the national governments.

The task of locating Indigenous traditional knowledge is certainly more difficult in light of the burdens carried by the colonial legacy. All forms and practices of Indigenous knowledge have been negatively impacted by the practices and policies of colonization. The imposition of Western systems of knowledge inherent in the colonial project have marginalized and subjugated Indigenous traditional knowledge systems. Through colonization, Western knowledge systems have carried the power to depict their epistemologies (knowledge systems) as universal and authoritative, which has served to singularly legitimate its own knowledge systems while concurrently de-legitimizing others. This ethnocentric knowledge has been transmitted through legal, government and academic channels to promote patriarchal, capitalist, and often ecologically destructive policies and practices that have underestimated and undervalued Indigenous traditional

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systems of knowledge. The result has been the marginalization of Indigenous traditional systems of knowledge, and in some cases, it has resulted in the alteration or the loss of the practice.

### Problem of Study

As regards protection of knowledge, innovations and practices associated with biological resources, these do not seem to fall in the conventional legal systems of IPR protection (e.g., patents, copyrights, trademark, etc.). These conventional forms of IPRs are inadequate to protect indigenous knowledge essentially because they are based on protection of individual property rights, whereas traditional knowledge is, by and large, collective. Further, the informal knowledge presents other difficulties in being recognized for the purpose of IP protection, such as: Knowledge is developed over a period of time and may either be codified in texts or retained in oral traditions over generations. The conditions of novelty and innovativeness that are necessary for grant of patent are therefore not satisfied. Nevertheless, the development of an appropriate form of protection for the knowledge of local communities is of great interest to countries which are rich in biodiversity, and also rich in traditional knowledge, such as India.

### Scope of the Study

The scope is extended to range of options employed under conventional IP regimes, such as patents, trademarks, designs, copy rights as well as geographical indications, bio diversity, protection of plant variety and also *sui generis* systems.

### Aims & Objectives

To study the evolution and historical development of the concept of traditional knowledge protection in India and in international platform. An endeavour is made to trace the historical back ground of IPR and the conceptualisation of traditional knowledge in it. It discusses the historical development of Traditional knowledge in international as well as in Indian perspective.

### Methodology

Methodology for this research work as adopted by the researcher is mainly doctrinal in nature. Descriptive, explanatory, critical and analytical method is also followed in the research work. In this direction the data for the research are gathered mainly from the secondary sources.

### Sources

1. The various enacted laws, regulations, by laws, circulations and reports.
2. Various international Treaties, Agreements and Conventions. Secondary sources like:
3. Books (monographs, text books, reference books)
4. The decisions rendered by the higher judiciary relating to IPR and traditional knowledge reported in different law journals.
5. Articles written by eminent Jurists, Academicians, Lawyers and journalists etc. published in leading law journals.
6. Important Web sites on internet relating to traditional knowledge in particular and IPR in general.
7. Legal Dictionaries and Encyclopaedias etc.

### International Perspective

The potential role of intellectual property rights in the protection of traditional knowledge is an emerging field, which requires thorough exploration. Although there are at present no clear, specific international intellectual property standards for protecting such knowledge, there are a growing number of instances where individuals and organizations are resorting to existing patent, trademark or copyright systems to protect their knowledge and culture. These efforts have met with mixed success, but greater appreciation and respect for traditional knowledge is drawing international attention to these issues.

### During Colonial Rule

In the colonial period, when Europe was "discovering" the world, the disciplines of ethno botany and ethno zoology were established to grapple with the sudden influx of biological information from "exotic" corners of the world. These disciplines grew by leaps and bounds, bolstered by substantial inputs of traditional knowledge. Their primary mission, however, was not to understand these other knowledge systems per se, but rather to glean from them useful information for the further development of colonial science. Efforts focused on compiling lists of novel plants and animals that were "useful" to local populations and, consequently, were thought to be of potential utility back home. But colonial scientists did not limit their reliance on local experts to the simple identification of species of interest. They actually adopted from their indigenous counterparts entire classification schemes that order and interpret these ecological systems according to an indigenous logic. In this manner, western taxonomic knowledge and practice were significantly transformed by their encounter with traditional systems of knowledge and meaning. European understandings of Indian botany, for example, "ironically, depended upon a set of diagnostic and classificatory practices which, though represented as Western science, had been derived from earlier codifications of indigenous knowledge" (Ellen and Harris 1999: 182). Throughout the colonial period, western scientific understandings expanded through the appropriation of traditional ecological knowledge, with little acknowledgment of the intellectual origins of their borrowed discoveries. Certainly the colonial attitude lives on in the surreptitious appropriation of traditional knowledge for commercial ends. At the same time, efforts are being made to move towards new relationships between science and traditional knowledge, based on partnership, exchange and mutual benefit. While the goals may be laudable, they remain difficult to achieve, and the way forward, even when travelled with the best of intentions, is fraught with pitfalls.

### After Colonisation

After colonisation and WWII were over, world society stepped into a new economic order. Numerous international institutions or multilateral co-operations in form of governmental and non-governmental organizations have emerged, for instance, the United Nations and its subsidiary organisations (i.e. World Intellectual Property Organization (WIPO), United Nations Economic and

Social Council (ECOSOC), Food and Agriculture Organizations (FAO), United Nations Conference on Trade and Development (UNCTAD), United Nations Environment Programme (UNEP), United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations High Commissioner on Human Rights (UNHCHR), etc), and the World Trade Organizations (WTO). The specific purposes of the institutions are based on their statutes to set up the mutual co-operation amongst nations.

## **Effect of Biotechnology**

Modern agricultural production techniques have replaced age-old farming techniques, particularly in western countries. Biotechnology has manipulated productivities, disease resistance and plants varieties. On the other hand, the agricultural sectors in most developing countries are still following age-old farming practices. Their agricultural productions are based on natural waters, managing disease and insect pests and low levels of technology.

In the health care sector, medicinal plants are still very essential for peoples. in less developed and developing countries. Eighty percent of the peoples still rely only on traditional medicines obtained from local plants. Eighty five percent of traditional medicine involves the use of plant extracts. Moreover, there are some two hundred chemicals extracted in pure form from approximately ninety plant species used in medicine throughout the world. About half of the world's medicinal compounds are still derived or obtained from plant sources. The medicinal plants are of great significance to both developed and developing countries. Those resources are known as genetic resources.

It is very difficult to estimate the number of genetic resources. Academics, such as W. Lesser, State: Scientists indeed have experienced great difficulty estimating the number of types of living organisms to within even an order of magnitude. Generally accepted estimates range from 6 million to 111.6 million species, with a 'work" figure of 1 6 million (Hawksworth and Kalin-Arroyo, 1995), of which about 1.4 million have been described (Wilson, 1992)

Developing countries are rich in traditional knowledge, especially genetic resources. The value of traditional knowledge, indigenous and genetic resources are both in economic and cultural. Traditional knowledge and indigenous resources hold an increasing economic importance to indigenous peoples and local communities, for instance, traditional knowledge of the biodiversity and genetic resources in the local flora and fauna has contributed to the productivity of various industries.

In addition, developing countries are recognised as having most of the world's base crop collections, particularly, in plant genetic resources that might contain undiscovered useful compounds for medicine. Those resources may well occur only in specific geographical areas, for instance, in the rainforest areas or tropical countries.

The genetic resources of developing countries have contributed to the production of large-scale agricultural commodities in developed countries. Naomi Roht-Arriaza cites that: Indigenous and local farming communities have contributed significantly to

the quality and diversity of the germplasm that forms the Western countries crop production. Genes for fifteen major crops that first grew in the fields of developing countries now contribute more than \$ 50,000,000 in annual sales in the United States alone. Community-based innovation systems develop and maintain this crucial genetic diversity because indigenous farmers breed varieties suited to their specific local needs and microenvironments.

It is now widely accepted that traditional knowledge, indigenous resources genetic resources are crucial issues, particularly in the agricultural and medicinal sectors. The following topic will address how genetic resources from developing countries flow to developed countries and how their protection has become a matter of debate since the end of twentieth century.

## **The Flow of Genetic Resources from Developing countries to Developed Countries**

There are three main significant issues which need clear understanding to know how the concern for protection of traditional knowledge evolved causes for the flow of genetic resources from developing countries to developed countries. Firstly, the extinction of genetic resources/ declining of traditional knowledge in developing countries, secondly, the concept of 'plant genetic resources being the common heritage of mankind' and thirdly, the concept of 'intellectual property rights on living resources'.

## **The Extinction of Genetic Resources**

In the early twentieth century, the extinctions of both plant and animal species were acknowledged. Academics such as Klaus Bosselmann state that: Estimate of the number of species that exist today vary from ten to hundred million, up to twenty-five percent of which may currently be at risk. Of this number, approximately 1.4 million species have been named by science. (Paul R. Ehrlich and Edward O. Wilson, 1991) At current rates, one-quarter of all the Earth's species could be lost by the end of the next century. Fifty species of plants and animals become extinct every day. As a result, an estimated fifty percent of the world's species are found in tropical forests, including 100,000 of the planet's 250,000 species of higher plants. Less than one-sixth of these species are known to be classified in any way, and only one percent of tropical rainforest species have been surveyed for potential agricultural protection measures, crop scientists and agricultural developers have prepared for this exigency by assembling large collections of genetic resources in gene banks and making them available for crop improvement.<sup>iii</sup> In 1970, an international framework for collection, conservation, utilisation, and exchange of genetic resources was established. These include the International Board for Plant Genetic Resources Institute (IPGRI), the world collections of principal crops at International Agricultural Research Centres, (such as the International Rice Research Institute), and national collections, (such as those of the National Seed Storage Laboratory in Fort Collins, Colorado).

In the meantime, the situations of extinction of genetic resources and the increasing world population, particularly in third world countries,

created a need to preserve genetic resources in whatever way. Large amounts of genetic resources were transferred from the third world to developed countries without awareness and compensation.

The issue of genetic resources flow has not been mentioned recently. Instead of this, the genetically modified organisms (GMOs) issue has become the crucial issue being debated in world forums. Academics such as Michael Hassemer state that 'strong evidence suggests that with the growing extinction of species, traditional knowledge is also declining. What makes this extinction particularly deplorable-is its invisibility'.<sup>iv</sup> The awareness of the world food shortage is resulting in the flow of genetic resources from developing countries to developed countries. Preservation and production of plant genetic resources are being undertaken to save the world from starvation. As a result, there are many new plant varieties emerging due to biotechnological development. Thus plant varieties will be problematic with regard to intellectual property protection in the following decade.

### **The Concept of 'Plant Genetic Resources being the Common Heritage of Mankind**

The reference to crop genetic resources being the common heritage appeared in the 1980s in association with the establishment of the Commission on Plant Genetic Resources at the Food and Agricultural Organization of the United Nations (FAO). In 1983 the FAO conference affirmed a resolution that 'plant generic resources are a heritage of mankind and consequently should be available without restriction. In this context, Stephen B. Brush, also states:

The crop scientists who articulated the idea of common heritage for crop resources were acculturated in science as a social system without proprietary relations over its basic resources: theories, wgorithms, or methodologies (Robert K. Merton, 1973). The sociology of science in this context was described by Merton as the Communism of sciences in which concern for authorship did not imply exclusive rights. Accordingly, most crop scientists who helped establish the international framework for plant genetic resources worked in public breeding programs that released their products as public goods.

The concept of common heritage of crop genetic resources was widely adopted, especially amongst the crop scientists and agricultural developers. In fact, crop genetic resources could never be applied to criteria of common heritage of mankind in international law. The common heritage principle of international law is explicitly included in two international treaties. These are the Agreement Governing the Activities of States on the Moon and Other Celestial 1979 and the United Nations Convention on the Law of the Sea 1982.

Another major cause of genetic resources flow from developing countries to developed countries is the view of common heritage. Thus, if genetic resources are seen to belong to all peoples, it is not necessary to allow for sharing of benefits or any protection measures. It is interesting that the concept of common heritage of mankind was introduced to apply to genetic resources, but not to other non-

renewable resources, such as oil and gas. Those non-renewable resources should be taken into account more than renewable plant resources.

### **The Concept of 'Intellectual Property Rights on Living Resources'**

While there has been a general assumption that living things cannot be patented, this concept is explicitly known and accepted by intellectual property scholars.

At the end of the twentieth century, the development of biotechnology became impacted on the medical and food sectors Biotechnology also offers specific new possibilities for information and interventions affecting human life To protect biotechnology, questions were raised in public debate about whether living organisms could be patented or not The debate includes moral considerations relating to human life, research on the human genome, animal welfare issues, the issues relating to the limits of intellectual property rights and the environmental as well as health and safety issues The European Union (EU) has spent decade debating this issue. Finally, they agreed to harmonise the criteria for the patentability of organic material under the Directive on the Legal Protection of Biotechnological Inventions 1998.

The situation with regard to patenting biological organisms in the United States is clearer. The United States Government passed the Plant Patent law of 1930 and the Plant Variety Protection Law of 1970, both of which had been passed in the brief that patent law did not extend to living things. In 1980, the United States Supreme Court ruled in the Chakrabarty Case that living things are capable of being patented under the general law. This case is considered as a landmark case to protect plants, seeds and tissue cultures. As a result, the United States probably leads the world in the scope of protection that it offers to biotechnological inventions in that 'invented' living organisms can be patented and that plant varieties can be patented and protected.

The concept that 'living resources cannot be patented' is also a cause of genetic flow. This concept is support to the concept of common heritage which believes that genetic resources belong to all peoples. Developing countries were not taken into account with regard to the protection of their resources because genetic resources were not protected by intellectual property rights.

### **Recent International Development**

Recently, international attention has turned to intellectual property laws to preserve, protect, and promote the traditional knowledge. The reasons for this are complex. In 1992, the Convention on Biological Diversity (CBD) recognized the value of traditional knowledge in protecting species, ecosystems and landscapes, and incorporated language regulating access to it and its use (discussed below). It soon became apparent that implementing these provisions would require that international intellectual property agreements would need to be revised to accommodate them.

This became even more pressing with the adoption of the World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property

Rights (TRIPs), which established rules for creating and protecting intellectual property that could be interpreted to contradict the agreements made under the CBD. In response, the states who had ratified the CBD requested the World Intellectual Property Organization (WIPO) to investigate the relationship between intellectual property rights, biodiversity and traditional knowledge. WIPO began this work with a fact finding mission in 1999. Considering the issues involved with biodiversity and the broader issues in TRIPs (involving all forms of cultural expressions, not just those associated with biodiversity - including traditional designs, music, songs, stories, etc.), WIPO established the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC-GR traditional knowledge F).

The period of the early 1990s to the Millennium was also characterized by the rapid rise in global civil society. The high-level Brundtland Report (1987) recommended a change in development policy that allowed for direct community participation and respected local rights and aspirations. Indigenous peoples and others had successfully petitioned the United Nations to establish a Working Group on Indigenous Populations that made two early surveys on treaty rights and land rights. These led to a greater public and governmental recognition of indigenous land and resource rights, and the need to address the issue of collective human rights, as distinct from the individual rights of existing human rights law.

The collective human rights of indigenous and local communities has been increasingly recognized - such as in the International Labour Organization (ILO) Convention 169 (1989) and the Declaration on the Rights of Indigenous Peoples (2007). The Rio Declaration (1992), endorsed by the presidents and ministers of the majority of the countries of the world, recognized indigenous and local communities as distinct groups with special concerns that should be addressed by states.

Initial concern was over the territorial rights and traditional resource rights of these communities. Indigenous peoples soon showed concern for the misappropriation and misuse of their "intangible" knowledge and cultural heritage. Indigenous peoples and local communities have resisted, among other things: the use of traditional symbols and designs as mascots, derivative arts and crafts; the use or modification of traditional songs; the patenting of traditional uses of medicinal plants; and the copyrighting and distribution of traditional stories.

Indigenous peoples and local communities have sought to prevent the patenting of traditional knowledge and resources where they have not given express consent. They have sought for greater protection and control over traditional knowledge and resources. Certain communities have also sought to ensure that their traditional knowledge is used equitably-according to restrictions set by their traditions, or requiring benefit sharing for its use according to benefits which they define.

## Recent development-Traditional Knowledge Digital Library (TKDL)

The issue of biopiracy and unethical bioprospecting made headlines after Government of India successfully achieved revocation or limitation of turmeric and basmati rice patents granted by United States Patent and Trademark Office (USPTO) and the neem patent granted by European Patent Office (EPO) in late 1990s.

Soon cases of more such patent claims came into light and also the fact that India's vast traditional medicine knowledge existed in languages like Sanskrit, Hindi, Arabic, Persian, Urdu, and Tamil, making it inaccessible for patent examiners at the international patent offices to verify such claims. This experience prompted the Department of AYUSH, Government of India to create a task force of experts in the areas of traditional medicine systems of India, i.e. Ayurveda, Unani, Siddha as well as Yoga, patent examiners, IT experts, scientists and technical officers, for the creation Traditional Knowledge Digital Library (traditional knowledgeDL), which was finally initiated in the year 2001. The task included, for example transcribing Sanskrit shlokas which describe an Ayurvedic formulation in text form, using Traditional Knowledge Resource Classification (traditional knowledgeRC) devised for the purpose, so that it is easily understandable to any patent examiner, anywhere in the world. For this reason, the entire text, all 34 million pages of it, is available in five languages: English, German, French, Spanish and Japanese.

As the database project reached its completion, the government in 2006 decided to allow access to the library to international patent offices, including European Patent Office (EPO), Japan and the UK, subject to a non-disclosure clause. This allowed patent examiners to evaluate patent applications and stop attempts to patent traditional knowledge as "new" inventions. Subsequently, agreements were signed with European Patent Office (EPO) in February 2009, with United Kingdom Trademark & Patent Office (UKPTO) in January 2010, apart from an agreement with the U.S. Patent and Trademark Office (USPTO) after the Summit meeting between US President Barack Obama and Prime Minister, Manmohan Singh, also in January 2010. With patent examiner getting access to traditional knowledge DL database, legal cases regarding unethical patent claims, which in the past have taken years and vast expenditure for bringing each case to fruition, could be avoided. Another project to include data relating to 1,500 postures in yoga began in 2008, after new reports of a large number of false gurus and yoga masters, who attempted to patent in their country this ancient knowledge, for example 131 yoga-related patents were traced in the US alone in 2007, and after uproar in the parliament and media, Government of India took up the issue with USPTO.<sup>[14][15]</sup> Thereafter, a team of yoga gurus from nine schools working with government officials and 200 scientists from the Council of Scientific and Industrial Research (CSIR) scanned 35 ancient texts including the Hindu epics, the Mahabharata and the Bhagwad Gita, and Patanjali's Yoga Sutras to register

each native pose, and end 2009, 1500 asanas were to be added.

As a future project, a people's Register of Biodiversity, is also being set up by the government, to document and protect, traditional knowledge passed down through the oral tradition, under India's National Biodiversity Act of 2002.

#### Findings

Misappropriation of traditional knowledge and bio-piracy of genetic resources are the issues of great concern for all the developing countries. These issues are being pursued at several multilateral forums, such as Convention on Biological Diversity, TRIPs Council, World Trade Organization and World Intellectual Property Organisation. However, so far a 'global framework' for traditional knowledge protection system has not been established. Neither the international community nor the Indian legislation provides a law specifically designed for protection of traditional knowledge and in the Indian legal environment, no agreed definition of traditional knowledge has been established.

#### Suggestions

A comprehensive strategy for protection is needed considering the community, national, regional and international dimensions of traditional knowledge. The stronger the integration and coordination between concern organisations, the more likely the overall effectiveness. Developing countries really need to craft their way in order to prevent their traditional knowledge from being siphoned to the west without benefits on the use of such resources flowing to the east. As already highlighted the ability to have IPR laws changed for their benefit lies in their co-operation. Developed countries themselves should work in co-operative blocks.

Only IPR have proven largely inadequate in upholding traditional communities' rights over their traditional knowledge. The introduction of sui generis elements as procedural safeguards, incorporated into the existing IPR law structure, was put forward as an effective alternative. Each international instrument recognizes that the traditional knowledge of the indigenous people is their cultural legacy and that the people have a right for such knowledge to be

protected from misappropriation. Internationally enforceable minimum standards providing for a globally harmonized approach to traditional knowledge protection are also needed. Having put forward a regime of intellectual property protection, the importance of alternative approaches to protect traditional knowledge should not be overlooked. Efforts based on human rights and indigenous peoples' rights should be encouraged as should any model which incorporates the customary laws of indigenous peoples. Equal rights for indigenous peoples are not limited to the use of their resources and it is beyond the scope of intellectual property law to answer wider questions relating to indigenous peoples' self-determination. The diverse models of protection are not mutually exclusive, however, and instead of a fragmented approach a paradigm exploring synergies between these disciplines should be encouraged. The various parties with an interest in traditional knowledge should attempt to work together as partners towards the same end rather than as rivals fighting over limited resources.

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