



International Federation of
Library Associations and Institutions
36(4) 294–299
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DOI: 10.1177/0340035210388246
ifla.sagepub.com



Preserving traditional knowledge: Initiatives in India

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Abstract

Traditional knowledge is a valuable asset for any country as it plays a vital role in making the nation more progressive and transforming its society. This paper discusses the need for preserving traditional knowledge. The paper describes the role of the Traditional Knowledge Digital Library and its activities in preserving traditional medicinal knowledge in India.

Keywords

traditional knowledge, traditional medicinal knowledge, indigenous knowledge, Traditional Knowledge Digital Library, intellectual property, patents, India

Traditional knowledge

The knowledge and uses of specific plants for medicinal purposes (often referred to as ‘traditional medicine’) is an important component of Traditional Knowledge (TK). TK is also termed ‘indigenous knowledge’ (IK), ‘traditional environmental knowledge’ (TEK) and ‘local knowledge’.¹ It refers to the knowledge systems held by traditional communities and is based on their experience and adaptation to a local culture and environment. This knowledge is used to sustain the community and its culture. Placing value on such knowledge helps strengthen cultural identity and the enhanced use of such knowledge to achieve social and development goals, such as sustainable agriculture, affordable and appropriate public health, and conservation of biodiversity.² Traditional knowledge is collective in nature and is often considered the property of the entire community, and does not belong to any single individual within the community. For many communities, TK is inseparable from their cultural values, spiritual beliefs and customary legal systems and is viewed as their intellectual property. Such systems are significant, not only for these communities, but also for the whole world.³

Intellectual property and traditional knowledge

The term ‘intellectual property’ (IP) reflects the idea that it is the product of the mind or the intellect. It

is protected through law and can be owned, sold or bought.⁴ IP law confers enforceable rights upon the person responsible for the intellectual output, so that the creator or owner of IP can exercise a measure of control over its future use. It plays an important role in all aspects of human life, including health care. Each country has developed its own IP laws to regulate the use and re-use of intellectual inventions within specific territorial boundaries.

The role of IP systems in relation to traditional knowledge, its preservation, protection and use, has recently received increasing attention in a number of international forums on matters as diverse as food and agriculture, the environment (notably the conservation of biological diversity), health (including traditional medicine), human rights and indigenous issues, and aspects of trade and economic development.⁵ While the policy issues concerning TK are broad and diverse, the IP issues break down into two key themes: positive protection (giving TK holders the right to take action or seek remedies against certain forms of misuse of TK) and defensive protection (safeguarding against illegitimate IP rights taken out by others over TK subject matter)⁶.

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Indigenous and local communities have argued in national and international law-making bodies that their knowledge systems should not be used by others, without their consent, as well as arrangements for fair sharing of the benefits. Understanding the role of intellectual property and TK, various inter-government bodies like the Convention on Biological Diversity (CBD)⁷, the World Intellectual Property Organisation (WIPO)⁸, the Food and Agriculture Organisation of the United Nations (FAO)⁹, the World Trade Organisation (WTO)¹⁰ and the United Nations Conference on Trade and Development (UNCTAD)¹¹ are working in this direction. WIPO has taken the initiative by considering the needs of the representatives of TK-holding communities from all over the world. In 1981, WIPO and UNESCO adopted a model law on folklore¹². In 1989, the concept of Farmers' Rights was introduced by the FAO into its International Undertaking on Plant Genetic Resources, and in 1992 the CBD highlighted the need to promote and preserve traditional knowledge.¹³ The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC)¹⁴ was established in 2001 as an international policy forum. Many multilateral treaties have also been enacted over the last more than 100 years with nation states enacting the general principles found in such treaties into their own domestic laws. For instance, India¹⁵ has adopted *sui generis* laws that protect at least some aspects of TK.

Traditional medicinal knowledge of India

Indians have an age old tradition of using herbs and spices with medicinal value, like amla (*Phyllanthus emblica*), black pepper (*Piper nigrum*), basil (*Ocimum basilicum*), etc. Amla (Indian Gooseberry) is the most potent natural source of vitamin C, which is an excellent anti-oxidant and contains as much vitamin C as two oranges. It helps maintain a stronger, healthier digestive system, improved overall immunity, detoxifies the body, purifies the blood, lowers cholesterol, enhances vision, and strengthens the lungs, respiratory system and central nervous system. Kali Mirch (black pepper) is an expectorant, carminative, antipyretic, anthelmintic and appetizer. In India, it has been used as a medicine to cure toothache, asthma, chronic indigestion, colon toxins, obesity, sinus congestion, fever, colic pain, cholera, gastric ailments, etc. Another Indian spice called methi (fenugreek) cures indigestion, constipation, mouth ulcers, prevents the formation of kidney stones, and controls blood sugar level. Tulsi, the most sacred herb of India, is used as a nerve tonic, to sharpen memory, and cure fevers, common

colds and respiratory disorders like bronchitis, asthma and influenza, etc. It also acts as a remedy in cases of influenza, kidney stone and heart disorders by reducing blood cholesterol. Ginger, perhaps the most sought after spice in most of the Indian foods, provides relief from sweating, vomiting, dizziness, nausea, arthritic pain, ulcerative colitis, headaches, fevers from flu and colds, sore throats, and chemotherapy. This traditional knowledge about the uses of herbs, better known among Indians as 'dadi maa ke nuskhe' (Grandma's treatment), has been handed down from one generation to another and forms an inseparable part of Indian culture.

Such traditional knowledge is being used by a number of pharmaceutical organizations. In South India, the medicinal knowledge of the Kani tribes led to the development of a sports drug named Jeevani, an anti-stress and anti-fatigue agent, based on the herbal medicinal plant arogyapaacha.¹⁶

Traditional Knowledge Digital Library (TKDL)

India's rich traditional knowledge has not only been passed down by word of mouth from generation to generation, but has also been described in ancient classical and other literature. Such knowledge is often inaccessible to the common man, and even when accessible, is rarely understood, as it exists in local languages such as Sanskrit, Urdu, Arabic, Persian, Tamil, etc. Documentation of this existing knowledge of various traditional systems of medicine, available in the public domain, has become imperative to protect it from being misappropriated in the form of patents on non-original innovations.¹⁷ It had been observed that, in the past, patents have been granted to inventions related to already known traditional knowledge because the patent examiners could not search for relevant traditional knowledge as prior art, due to the non-availability of such information in the classified non-patent literature. In 1995, the United States Patent Office granted a patent on the wound-healing properties of turmeric (*Curcuma longa*) which was challenged successfully and the patent revoked. The revocation of the patent granted by European Patent Office to W.R. Grace Company and the United States Department of Agriculture on neem (EPO patent No. 436257), again on the same grounds of its use having already been known in India, is another example.¹⁸ A study conducted in 2000 showed that 4,896 patents on medicinal plants had been granted by the US Patent Office, 80 percent of which were on plants of Indian origin¹⁹. The findings also revealed that out of 760 such patents, 350 should have

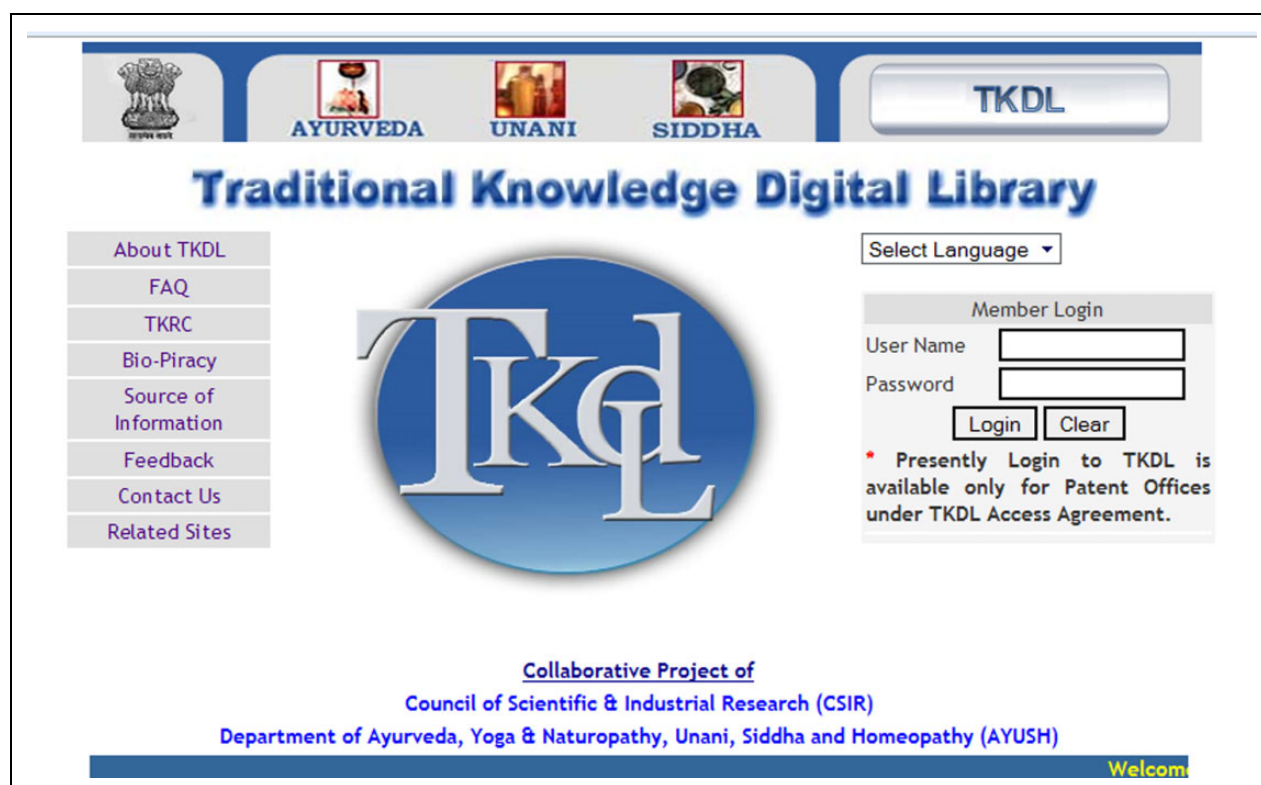


Figure 1. The TKDL interface.³⁰

not been granted. Some 200–500 such patents are granted every year, mainly due to the lack of access to documented traditional knowledge in India. Every year, about 1,500 patents were being granted by the European Patent Office (EPO) and the US Patent Office, based on traditional Indian knowledge in medicine.²⁰

Keeping in view the importance of such traditional medicinal knowledge, the Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) of the Indian government constituted an inter-disciplinary Task Force in 1999 for the preparation of an approach paper on establishing a Traditional Knowledge Digital Library (TKDL). Accordingly, the Government of India has undertaken the development of the TKDL database to prevent patenting of inventions based on Indian traditional knowledge (Figure 1).

TKDL aims to act as a bridge between the traditional knowledge existing in local languages and the patent examiners at various international patent offices. If TKDL had existed earlier, international disputes such as those referred to above would not have arisen. TKDL has also resolved the perpetual problem of lack of access to documentation on India's traditional medicine due to language barriers or formatting incompatibilities, thereby abating the loss of future revenue and resources. It is seen by India as a safeguard against the burgeoning research-based fields

of biopharmacology, integrative medicine (IM), evidence-based complementary and alternative medicine (CAM), ethnobotany, and ethnopharmacology.²¹

TKDL is a joint project of five Indian government organizations, including the Council of Scientific and Industrial Research (CSIR) and the National Institute of Science Communication and Informative Resources (NISCAIR). More than 150 traditional medicine practitioners, information technology engineers, patent examiners, intellectual property attorneys, scientists, researchers and librarians worked together to construct this database for India's indigenous medical and scientific knowledge resources which would fit within the framework of the International Patent Classification (IPC) scheme. The TKDL teams systematized and arranged the ancient and mediæval Indian medicaments in this database in accordance with modern conventions of taxonomy. The database is built up from transcribed texts of the triad of Indian medical sciences – Ayurveda, Unani and Siddha – transposed sacred slokas (verses), of 14 ancient texts from the 6th to the 3rd century BC Vedic corpus, and other authoritative Oriental canons and treatises.

Translation of palm leaf scriptural verses, parchment manuscripts, textbook citations and oral tradition references into decoded English, French, German, Japanese, and Spanish required Brahmi-based and

other non-Latin script conversions of Vedic Sanskrit, classical Sanskrit, Hindi, Arabic, Farsi/Persian, Dravidian Tamil and Urdu in accordance with international language encoding standards (ISO) and Unicode metadata. The TKDL team developed a 'smart translation' software to produce the scanned text and images from 54 primary sources on ayurvedic medicinal properties, provenance data, biological activity, chemical constituents, approximately 150,000 triad medicines and pharmaceutical preparations, 1,500 yoga asana therapies, traditional botanical names, malady descriptions, and other bibliographic details in contemporary terminology²². TKDL has completed documenting over 220,000 medical formulations (including 81,000 Ayurveda, 140,000 Unani and 12,000 Siddha formulations) and saved them from piracy. TKDL is a dynamic database, where formulations are continuously added and updated according to inputs from the users of the database.

The information on traditional medicines appears in a standard format in TKDL. For example, formulations on Indian Systems of Medicine appear in the form of a text, which comprises the name of the drug, origin of the knowledge, constituents of the drug with the parts used and their quantity, method of preparation of the drug and usage of the drug as well as bibliographic details. TKDL uses modern names of plants (e.g. *Curcuma longa* for turmeric), diseases (e.g. fever for jwar), or processes and establishes relationships between traditional knowledge and modern knowledge.²³ TKDL includes a search interface providing full text search and retrieval of traditional knowledge information using the International Patent Classification (IPC), Traditional Knowledge Resource Classification (TKRC) and keywords in multiple languages. TKRC, an innovative structured classification system for the purpose of systematic arrangement, dissemination and retrieval has been evolved for about 25,000 subgroups related to medicinal plants, minerals, animal resources, effects and diseases, methods of preparations, mode of administration, etc.²⁴ Search features of TKDL include complex Boolean expression search, proximity search, field search, phrase search, etc. The database does not claim exhaustive coverage and does not affect the rights and obligations relating to any prior art traditional knowledge formulation or know-how not listed in TKDL. Hyperlinks to other websites are provided for convenience only. This does not imply either responsibility or approval of the information contained in those websites.

The contents of TKDL are being digitally transcribed into a readable form in five international languages – English, French, German, Japanese and

Table 1. Current status of TKDL databaseⁱ

Discipline	Number of texts (including volumes) used for transcription	Transcribed formulations
Ayurveda	75 books	85,500
Unani	10 books	120,200
Siddha	50 books	13,470
Yoga	15 books	1,098
Total	150 books	220,268

ⁱ Council of Scientific & Industrial Research (CSIR) (n.d.). *About TKDL Traditional Knowledge Digital Library (TKDL)*. Retrieved July 2, 2010, from <http://www.tkdil.res.in/tkdil/langdefault/common/Abouttkdil.asp?GL=Eng>

Spanish – with the objective of preventing their misappropriation at international patent offices. The status of transcription of the traditional medicine formulations in the TKDL as of May 2010 is given in Table 1.

India is going all out to save yoga, a 2,000-year-old Indian art of righteous living. The team of TKDL is presently scanning through 35 ancient Sanskrit texts, including the Mahabharata, Bhagawad Gita and the Yoga Sutras of Patanjali to identify and document all known yoga concepts, postures and terminology. Among the yoga books being scanned by scientists are *Hatha Praditika*, *Gheranda Samhita*, *Shiva Samhita* and *Sandra Satkarma*. Currently, 600 'asanas' (physical postures) have already been documented with a target to put on record at least 1,500 such yoga postures by the end of 2009. Till now, 130 yoga-related patents granted in the USA have been traced by TKDL.²⁵ Once the postures are put on record, they would be made available in five international languages. Besides photos and explanation of the postures, video clips of an expert performing them will be put in the TKDL. A voice-over will also point out which text mentions the posture.

In February 2009, the Indian government granted access to TKDL to the European Patent Office under a three-year agreement. The TKDL allows examiners at EPO to compare patent applications with existing traditional knowledge. New patent applications need to demonstrate significant improvements and inventiveness compared to prior art in their field. The cooperation between India and the EPO comes at a time when many countries are struggling to protect traditional and respected knowledge against exploitation, primarily in the pharmaceutical sector. The 34 member states of the EPO now have restricted access for purposes of patent search and examination. TKDL is integrated with the EPO's database as another measure to thwart illegitimately-gained exclusivity.²⁶ Experts

at the EPO say that access to the 30-million-page database will help them to correctly examine patent applications relating to traditional knowledge at an early stage of patent examination. One perceived flaw is the lack of accessibility to online backtracking of certificates of correction and defective patents. Patents are granted for new uses, innovative delivery systems, different combinations, and novel variations of chemical entities and properties.

The TKDL effort has also been appreciated at the international level as well. It has become a model for other countries on defensive protection of their traditional knowledge from misappropriation. Countries and organizations such as South Africa, the African Regional Intellectual Property Organization (ARIPO), Mongolia, Nigeria, Malaysia and Thailand have expressed their keen desire to replicate TKDL.²⁷

Conclusion

TK is part and parcel of the daily life of Indians. Very few countries in the world can boast of the variety and vastness of traditional knowledge that India has. However, this knowledge has been exploited throughout the world and is being exclusively patented by foreigners. Natives of India have protested against this, and have urged the government to take every measure to protect our traditional knowledge heritage. Libraries also can play a significant role in this regard as they are now implementing digitization projects for the preservation of our national heritage. However, projects like TKDL should be open for citizens to add new forms/cases of traditional knowledge which are still undiscovered by our scientists.

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