

## Traditional Knowledge and Innovation Management Strategies in India: Recent Trends

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### ABSTRACT

The country has been losing in the arena of claiming its intellectual property due to not documenting large traditional knowledge base residing in traditions, rituals, culture, society and its value system. People have failed in showcasing knowledge asset to the world, allowing them to capitalise on our knowledge. There is an urgency to sensitise people of India and make them aware of the value of tacit knowledge. This paper emphasises on the dual approach of preserving our ancient knowledge, while managing ongoing innovations of the citizens of India right from the grassroots level. The author is able to analyse the current scenario prevailing in India and establish that significant initiatives have been taken in recent past by several agencies, including the Government of India. These initiatives need to be mobilised in a systematic manner, as they are in nascent stage with teething troubles. Organisations, including libraries, as-well-as individuals will have to play a proactive role to re-establish India as the Knowledge Nation of the world.

**Keywords:** Traditional Knowledge, Indigenous Knowledge, Innovation Management, Digital Library,

### 1. TRADITIONAL KNOWLEDGE

Traditional knowledge (TK) is also termed as 'indigenous knowledge' (IK), 'traditional environmental knowledge' and 'local knowledge'. 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 aids to achieve social and development goals, such as sustainable agriculture, affordable and appropriate public health and conservation of biodiversity. It 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. It is inseparable from their cultural values, spiritual beliefs and customary legal systems and is viewed as their intellectual property (IP). Such systems are significant, not only for these communities, but also for the whole world.

### **1.1. Indigenous Knowledge**

The United Nations Environment Programme (UNEP) has defined the IK as the knowledge that an indigenous (local) community accumulates over generations of living in a particular environment. It is referred to the large body of knowledge and skills that has been developed outside the formal educational system. The IK is embedded in culture and is unique to a given location or society. (UNEP, 2012)

The IK is unique to every culture and society and is embedded in community practices, institutions, relationships and rituals. It is considered a part of the local knowledge, in the sense that it is rooted in a particular community and situated within broader cultural traditions. It is a set of experiences generated by people living in those communities. It is the basis for local-level decision making in agriculture, healthcare, food preparation, education, natural resource management and a host of other activities in rural communities.

It encompasses all forms of knowledge – technologies, know-how skills, practices and beliefs – that enable the community to achieve stable livelihoods in their environment and plays a vital role in the lives of the poor. It is the basis for decision making of communities in food security, human and animal health, education and natural resource management.

### **1.2. Features of TK/IK**

Features of IK can be summarised in the following ways:

- ❖ Locally bound, indigenous to a specific area.
- ❖ Culture and context specific.
- ❖ Non-formal knowledge.
- ❖ Orally transmitted and generally not documented.
- ❖ Dynamic and adaptive.
- ❖ Holistic in nature.
- ❖ Closely related to survival and subsistence for many people worldwide.

### **1.3. The Significance of TK/IK**

The TK/IK is integral to the identity of most local communities. It is a key constituent of a community's social and physical environment and, as such, its preservation is of paramount importance. The preservation, protection and promotion of the TK-based innovations and practices of local communities are particularly important for the developing countries.

In the emerging global knowledge economy, a country's ability to build and mobilise knowledge capital is equally essential for sustainable development as the availability of physical and financial capital. The basic component of any country's knowledge system is its IK. The IK is part of the lives of the rural poor; their livelihood depends almost entirely on specific skills and knowledge essential for their survival. Accordingly, for the development process, IK is of particular relevance for the following sectors and strategies:

- (i) Agriculture.
- (ii) Animal husbandry and ethnic veterinary medicine.
- (iii) Use and management of natural resources.
- (iv) Primary health care, preventive medicine and psychosocial care.
- (v) Saving and lending.
- (vi) Community development.
- (vii) Poverty alleviation.

The IK is not yet fully utilised in the development process. Conventional approaches imply that development processes always require technology transfers from locations that are perceived as more advanced. This has often led to overlooking the potential in local experiences and practices.

#### **1.4. The Need for TK Management**

Attempts to exploit TK for industrial or commercial benefit can lead to its misappropriation and can prejudice the interests of its rightful custodians. This knowledge is being used and patented by third parties without the prior informed consent of TK holders. Today, many IK systems are at risk of becoming extinct because of rapidly changing natural environments and fast-paced economic, political and cultural changes on a global scale. Practices vanish, as they become inappropriate for new challenges or because they adapt too slowly. However, many practices disappear only because of the intrusion of foreign technologies or development concepts that promise short-term gains or solutions to problems without being capable of sustaining them. The tragedy of the impending disappearance of IK is most obvious to those who have developed it and make a living through it.

The National Knowledge Commission is of the view that principled commercialisation of our cultural, creative and legacy practices has the potential of generating employment for at least 100 million people and an annual revenue of at least Rs. 600,000 crores per year.

## 2. INDIAN SCENARIO

It is estimated that annually, some 2,000 patents relating to the Indian medicinal systems were being erroneously granted by patent offices around the world. For a patent to be granted, an applicant must satisfy certain criteria, as defined by the National Patent Law, in particular, an applicant must prove that a claimed invention is novel and not previously known. The fact that so many patents had been wrongfully granted in the US and Europe caused a great deal of national distress. The people of India felt that knowledge belonging to India was wrongfully being taken away from them. These “wrong” patents conferred exclusive rights to exploit the technology in the country in which the patent protection was granted. This was a serious economic threat to the Indian producers and to their freedom to operate in foreign markets.

### 2.1. Bridging the Divide: TK Digital Library

On an average, it takes 5-7 years for opposing a granted patent at the international level. This could cost anywhere between \$200,000 and \$600,000 million. A comparison of time and costs associated with post-grant opposition and pre-grant opposition based on the submission of prior art evidence supported by TK documentation is tabulated in table 1 below:

**Table 1: Pre & Post Grant Opposition of Patent**

Sl. no.	Methodology and process	Post-grant opposition	Pre-grant objections supported by a database such as the TK digital library (TKDL)
1.	Nature	The opposing party is part of re-examination process, can submit counter documents and participate in re-examination and hearing process	The objecting party can only file evidence as a third party and cannot participate in the examination process
2.	Cost	Highly expensive and requires legal assistance	Inexpensive and does not require legal support, because prior art evidence is available from the TKDL
3.	Time period	4 – 13 years	3 – 20 weeks
4.	Documentation	Does not require extensive documentation	Requires extensive digital documentation
5.	Patent	Applicant can appeal invalidation of the patent	Patent applicant cannot appeal, as the application is rejected at the pre-grant stage

To address this grave situation, TK digital library (TKDL) was established as a collaborative project between the Council of Scientific and Industrial Research (CSIR) and the Department of AYUSH. It aims to ensure that patent offices around the world do not grant patents for applications founded on India's wealth of age-old TK. Using Information Communication Technology (ICT) tools and a novel TK resource classification system, the TKDL has converted and structured ancient texts into 34 million A4-sized pages along the lines of a patent application. Today, only because of TKDL, India has been capable of protecting some 0.226 million medicinal formulations at zero direct cost. Access to the database helps patent examiners root out those applications that clearly do not satisfy the novelty requirement at an early stage. The cost of protecting 0.226 million medicinal formulations in the absence of the TKDL is, therefore, beyond India's means.

## **2.2. Connecting TK Holders and Patent Examiners**

The TKDL is available at all patent offices that have signed a TKDL Access Agreement, which has built-in, non-disclosure mechanisms to safeguard India's interests and counter any possible misuse. Under such an agreement, the patent examiners may use the TKDL for search and examination purposes only and its contents may only be revealed to third parties for the purposes of citation.

The submission of Third Party Observations (TPOs) has proven to be the only cost-effective way of preventing misappropriation of TK at the pre-grant stage. The TKDL database has enabled the submission of TPOs that have resulted in the successful opposition of hundreds of patent applications filed around the world. Without documenting and digitising TK and making these databases easily accessible to patent examiners operating in the major languages of commerce, this would not have been possible. It has facilitated the cancellation/withdrawal of a large number of wrong patent applications concerning India's TK at zero cost in a few weeks. It has created a unique mechanism for overcoming language and format barriers by scientifically converting and structuring the TKDL content into five international languages, English, Japanese, French, German and Spanish, thus overcoming language barriers pertaining to TK in major patent offices worldwide. Also, an examiner can read a Sanskrit verse in international languages.

## **3. PRESERVING PAST @ IGNORING FUTURE?**

Innovation can no more be confined to a "water-tight compartment" of formal Research & Development (R&D) sector, as it now stands for any new and unique applications of old technologies, using design to develop new products and services, new processes and structures to improve performance in diverse areas, organisational creativity and public sector initiatives to enhance delivery of services. It provides sustainable and cost-effective solutions for people at the bottom of the socio-economic pyramid, and is being viewed as an important strategy for inclusive growth in developing economies. India has a long tradition of innovation and a

significant pool of qualified people, both within country as well as the diaspora, presently engaged in innovative activities. This talent pool has to be leveraged to drive the innovation agenda. Further, there is also a need to capture the multiple innovations happening in various domains, such as government, R&D labs, universities and across sectors, to give an impetus to the innovation process in the country.

### **3.1. National Innovation Council**

To make innovation a mass movement, the National Innovation Council (NInC) was setup in 2010 to discuss, analyse and help implement strategies for inclusive innovation in India and prepare a roadmap for innovation 2010--2020. The council is headed by Dr. Sam Pitroda, an advisor to the Prime Minister (PM) on innovation. It aims to catalyse change in mindset and mobilise people at grassroots level so that more and more people in education, business, government, non-governmental organisations, urban and rural development engaged in innovative activities are co-opted and are part of shaping the national-level innovation strategy. Initiatives have already been taken in key sectors, including State Innovation Councils, Sectoral Innovation Councils, Industry Innovation Clusters and University Innovation Clusters (UICs). A brief description of UICs is given below:

### **3.2. University Innovation Clusters**

Indian universities are known to produce some of the brightest minds, yet we fall short of expectations when we compare ourselves on innovation intensity and innovation capital with the rest of the world. Recognising this, the NInC has undertaken an effort to create *UICs*. This paper highlights the need for such clusters and proposes to strengthen the innovation environment with *Cluster Innovation Centres (CICs)*. These will spearhead multiple activities in the clusters and spur innovation activity in their environment. The paper also introduces the *Innovation Toolkit*, which will aid these innovation centres in their activities

Recognising the critical role of universities in fostering a culture of innovation in the country, the NInC has proposed the creation of CICs at universities. The NInC will partner with universities to catalyse the creation of at least 20 CICs across the country. A CIC is envisaged as a focal point for all efforts to promote innovations in and around the university system. Ideally, these innovation centres will function as independent bodies inside the university and facilitate collaborations between various stakeholders to create new knowledge, new products and new processes to solve the challenges faced at the local, national and global level. The CIC is expected to provide a range of services to universities and their partners right from encouraging innovative ideas to promoting inter/multi-disciplinary research, providing training and support on innovation and entrepreneurship, developing ideas into innovative applications, facilitating collaborations with industry and society, advice on IP management, commercialisation and marketing of these applications to benefit the society at large, etc. A CIC may broadly have the following components:

- Shared resources (offices, labs, computers and library).
- Incubator for ideas/startups.
- Innovation toolkit and helpdesk.
- Cluster innovation portal, website.
- Collaborations and networking facilitation.
- Training, workshops and seminars.
- Patents and IP management.
- State-of-the-art communications (National Knowledge Network (NKN), video conferencing, etc.)
- Cluster innovation strategy and roadmap.

In addition, innovation in an academic environment is not limited to developing ideas for new businesses. The academic institutions themselves need to innovate in the 21st century. In response to the rapid changes in the society, the universities too must be engaged in creating new domains of knowledge, new teaching learning methodologies and new forms of organisation and networking. The CICs at universities will also carry out programmes to focus on this aspect of innovation, which is very important for improving the quality of education in India.

#### 4. INDIA INCLUSIVE INNOVATION FUND

The Government of India has announced the launch of a \$1 billion (Rs. 5,000 crore) initiative called the India Inclusive Innovation Fund (IIIF), which will focus on fostering technological innovations aimed to serve the needs of millions of poor citizens in the country. The IIIF will start with a *seed capital* of \$20 million (Rs. 100 crore), as announced by the PM during the release of the first report of the NInC.

#### 5. NATIONAL INNOVATION FOUNDATION

It is an autonomous organisation established under the Department of Science and Technology (India). It was set up in February 2000 at Ahmadabad, India, to provide institutional support for scouting, spawning, sustaining and scaling-up innovations at grassroots level. It organises **IGNITE**, an annual competition for student's ideas and innovations conducted by the National Innovation Foundation (NIF). All students up to class 12 from any school (and of the same age group, but out of school also) in India are eligible to participate. The NIF is mandated to build a national register of ideas, innovations and TK practices related to agriculture, plants, animal health and human health. With the help of the Honey Bee Network, NIF has been able to document more than 1,50,000 ideas, innovations and traditional practices.

### 5.1. Activities of the NIF

There are 5 main functions of NIF:

Sl. no.	Activities	Scope
1.	Scouting and documentation	The NIF scouts for innovations and traditional practices across the country. The national biennial competition is one of the means to invite entries relating to original technological ideas, innovations and outstanding TK. Twice a year, a Shodhyatra (journey of exploration) is undertaken in remote regions in the hope of discovering hidden creative genius in the people. The NIF participates in agricultural fairs and exhibitions to scout for innovative solutions to problems.
2.	Value addition and research and development	Innovations discovered in their raw form are rarely optimised in terms of design and formulation. The NIF brings together inputs from formal science and subject matter experts to add value to such innovations. Research bodies such as the CSIR India, Indian Council of Medical Research (ICMR), BCI and higher education institutions such as (Indian Institute of Technology) IITs, partner with NIF to provide value addition and validation services.
3.	Business development and micro-venture innovation fund	The NIF helps in commercialisation of innovations by licensing those technologies to entrepreneurs. It also supports innovators to become entrepreneurs by providing funds for market research, test marketing, prototype development and pilot production. Most venture capital firms ignore such proposals because of the high-risk involved. However, NIF has the benefit of a micro-venture innovation fund sponsored by the Small Industries Development Bank of India (SIDBI) specifically for this purpose.
4.	Intellectual property (IP) management	The NIF protects the IP of the knowledge holder by helping the innovator draft and file patent applications and provides legal help to fight cases of IP infringement.
5.	Dissemination	The NIF disseminates TK and innovations discovered in one region to people in other regions of the country through means such as Shodhyatra, website, kiosks and competitions.



## 5.2. Network Partners

The NIF partners include Honey Bee Network, SRISTI, GIAN and government bodies.

Sl. no.	Initiatives	Year established	Scope
1.	<b>Honey Bee Network (HBN)</b>	1986-87	HBN is a crucible of like-minded individuals, innovators, farmers, scholars, academicians, policy makers, entrepreneurs and non-governmental organisations (NGOs). It has its presence in more than 75 countries. It provides access to the HNB database of 10,000 innovations.
2.	<b>Sustainable Technologies and Institutions (SRISTI)</b>	1993	It is an NGO setup to strengthen the creativity of grassroots inventors, innovators and ecopreneurs engaged in conserving biodiversity and developing eco-friendly solutions to local problems. It is devoted to empowering the knowledge rich—economically poor people by adding value in their contemporary creativity as well as TK. It provides organisation support to the activities of the HBN.
3.	<b>Grassroots Innovations Augmentation Network (GIAN)</b>	1997	Promotes value additions in innovations to sustain creativity and ethics of experimentation. It functions as a technology business incubator to help untrained, unqualified, individual innovators produce a sustainable business venture.

## 6. CONCLUSION

It can be concluded that the initiatives like TKDL, NInC, NIF, etc, in India have the potential to safeguard ancient wisdom and manage present tacit knowledge base by providing effective and efficient platform. With the announcement of IIF, the scenario seems to be positive. But, such ambitious programmes and projects demand participation in whatever capacity it is possible, which in turn will re-build 'Bhârata' by making India a country of Takshasilas and Nalandas.

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