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TRADITIONAL KNOWLEDGE IN NORTH EAST INDIA: A PERFECT CASE FOR SUI GENERIS LEGISLATION

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Abstract

With ever-growing field of Intellectual Property Regime where India is gradually progressing to become world leader and a player there is a need for strong protection of various industrial properties not only under conventional laws but also with an inclusive approach for recognizing the same. Intellectual Property not only covers inventions, designs, literary works, artistic work and performance plant varieties, symbols etc. but also the ancient traditional process, procedures and knowledge which have been a part of cultural heritage of India for centuries. For years developed countries had tried to take advantage of conventional IP laws which consider traditional knowledge as publicly available knowledge however it has been strongly opposed by countries in developing state for protection of skills, innovations, procedures and processes of communities who have been for ages making use of natural resources and preserving traditional knowledge. The contention that traditional knowledge is freely available for anyone or is a public domain has been rejected by these communities and indigenous people and nations on grounds of wrongful misappropriation and abuse. With global warming and slow gradual depletion of natural resources there is a strong thrust on developing traditional knowledge and innovations due to it. This is also a long-term goal of achieving the United Nations Sustainable Development Goals and in India from time immemorial TK of North East have assumed immense heritage. The paper analyses the protection which should be offered by suitable constitutional provisions and by sui generis legislation to Traditional Knowledge in North East India.

Keywords: Traditional Knowledge, Intellectual Property, Bio-piracy, North East India, legislation

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1. Introduction

The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom.

Isaac Asimov

Traditional Knowledge (TK) unlike other Intellectual property has not been defined anywhere in definite words not because it can't be but because it includes a wholesome basis of elements which makes it difficult to define in absolute words. TK are those knowledge of older generations, skills of elders, medical knowledge, practices, procedures which have been rooted in community from time immemorial and have been passed from generation to generation linking them to each other with a spiritual and cultural bond of knowledge. While TK in strict sense entails knowledge emancipating from a particular or specific practice, procedure and skills concluding in an intellectual activity, in broader sense it means the knowledge in itself engulfing traditional factors associated to it such as expression, signs and symbols. TK is a living knowledge which has been transferred from one generation to another orally and informally, hence, though it is found in agriculture, scientific or medicinal procedures it enjoys no established protection under current law of intellectual property regime. It not only limits itself to traditional knowledge but also adds in innovation and advancements which are gained during the passage of this knowledge from a period. In North East India, these information and traditional knowledge is developed under customary laws and hence considered as sacred and secret. In this part of country, the passage of knowledge from generation to generation creates rights as well as obligations which decides its usage, sharing of profits and benefits as well as settlement of any dispute which arises due to usage of this knowledge. This all is governed by way of customary law and do not find any protection under current legislation in force. Hence there is a great need for law under intellectual property regime for provisions to protect traditional knowledge.

TK innovations are mostly protected as Patent and Geographical Indication protection but it can be protected as Trademark as well as Trade Secrets also. Traditional Knowledge is a subject matter including the intellect, heritage, skills,

World Intellectual Property Organization, "Traditional Knowledge", available at: https://www.wipo.int/tk/en/tk/ (last visited on July 25, 2022).

practices and procedures of indigenous communities and others. Most of TK comprises of practical knowledge collectively owned and found in traditional architecture, designs, traditional music, performances, arts, rituals, fabrications, traditional dress, handicrafts production and artifacts. It also includes various procedures of food preparation, food preservation, and meat processing and cutting. A large usage of traditional knowledge is in the area of medicine and health which includes medicinal herbs, plants, healing, child delivery procedures and orthopedic procedure. Traditional designing of material made of gold, stone, precious metal or any work of any of this and wood is also TK. It also encompasses the custom old tradition of preying and hunting wild animals; fishing and skills required for it; incense, aromatic, perfumes, cosmetics which are manufactured and produced by traditional ways; weaving and dying of clothes and specifically produced gum, resins, dyes, paints etc.; traditional ways of conservation of water bodies, conservation of soil, usage of natural resources, biodiversity sustainability management and conservation; traditional farming and agricultural practices etc. In developing India, North East development is also major part of developmental agenda and knowledge of such indigenous practices can go a long way for making efficient use of available natural flora and fauna. In North East India traditional knowledge is not only used in farming, irrigation and sustainable practices but also used in allied things such as good germination, ways of increasing yield naturally, water management, soil conservation, protecting crops from pest and diseases to post harvest storage and management.

Some North East organic agriculture² includes forest litter which spread over like bedding in the field used as compost; terrace farming of rice and other crops; locally made drying kilns of mud for cardamom crops; use of cow dung for germination and yield of seeds. Leaves of many plants are used for protection from insects and protection of crop fields. Traditional form of ritual and worships like *Dibin, Tachi, Ampu and Mari* take place and sacrifices are made to please God to save crops from rains and diseases. About 30 fishing techniques are practiced in Arunachal Pradesh alone which are completely harmless to aquatic organism. Bamboo is being used for making water streams for continuous irrigation and to cultivate betel. Special recipes

Neelotpal Deka, "Traditional Knowledge in North-East India: Scope for a Sui Generis Protection", 3(1) The Clarion 92-97 (2014).

from cooked rice fermentation known as apong are also a tradition in Arunachal Pradesh.

These TK having been carried over for generations have developed a new set of ideas, innovation and inventions with a cultural attached to community thereby setting up a platform for this community to ask for exclusive ownership rights over this knowledge. Many of this traditional knowledge are basis of new patented inventions. However, there are instances wherein genuine communities who have these TK are not even aware that this is being patented by another person. Wherein TK is a community right which from time immemorial conserve and promote interest of collective community patents on other hand are used for promoting individual business and multiplying profits and monopolistic market. The reality is modern world needs a combination of both.

2. Traditional Knowledge-Types and Variety

Since TK is considered to be oral, informal and unrecorded form of Intellectual Property it is unprotected by conventional legal system in place. The diverse and complex form of TK makes it difficult to identify a TK as Intellectual property. TK is classified in various diversified way as: oral and written, fixed and variable, closely held by community and publicly available, religious sacred TK and available to all TK, documented and undocumented TK, TK held by indigenous community and the indigenous knowledge.

TK is said to be fixed when it is available in some tangible form such as recorded song, recipe book, printed book, movie or documentary which gives it a subtle form. It can also be said to be a documented TK. Documented TK is not only way of giving it a legal protection but it is also a means for wider preservation and dissemination. Most of the fixed TK are said to be verbal or unwritten like a song or a movie or written like recipe book and also as a figure or art which impliedly express some form. Variable TK is not available in any recorded form whether written or unwritten and is only found by way of oral history. Music, performances, healing skills and techniques are some variable TK.

The most complex part of granting protection to TK is for the oral part of TK since it is orally passed on information and the same is in contrast to the requirement of

patenting wherein it requires documented or written TK to determine its validity as patent. The problem which arises is if the documented TK can be exploited for misuse. The issue which arises have a dichotomy, as on one hand it undermines the interest of community with oral tradition and on the other hand it raises a concern of recognizing TK as a prior art. This challenge still remains for future conventions. One way of preservation and keeping the information safe is to keep it reserved for the concerned community only.

3. North East India Indigenous People Traditional Knowledge

Most of the population in North East India which is approximately 12-15% of population in India lives in hills and plains of North East and are majorly dependent on flora and fauna of remote hills and forest which they consider their home for centuries. The population of NE India depends heavily on plants and indigenous system of medicines which they have developed since ancient times. This is because of the presence of extremely rich biodiversity with several species found only in this part of the world. Traditional folk medicines, folk culture and dresses of muga silk, jhum cultivation practiced by hill farmers using all available natural resources to minimize risk and maximize output.³ Wetland rice cultivation by Apatani in Arunachal Pradesh, Zabo farming and Alder agriculture in Nagaland, large cardamom plantation in Sikkim and some traditional mixed cropping etc. are some examples of sustainable farming which are less risky, more productive and cost effective.

While the knowledge and usage of the traditional folk medicines have also developed by deep understanding of ecosystem, some of it has found its place in formal system of medicines and some are still guarded secret of community which has remained a secret throughout oral passage confined to members of family only. Secrecy of such knowledge creates an informal regime since the usage of these practices is only limited to the innovator and it is a secret as long as it is kept secret by the innovator and only then benefit arises to him. However, with time it becomes difficult to keep this knowledge a secret within community.

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³ L.C. De, "Traditional knowledge practices of North East India for Sustainable Agriculture", 10(1) *Journal of Pharmacognosy and Phytochemistry* 549-556 (2021).

4. Patenting Capability of Traditional Knowledge

Modern patent law is based on surmise that entire innovation and patent process has to be disclosed before a patent can be granted which renders that it is no more a secret. Even when the process is not patented the innovators manages to derive fair share of profits in way of monetary compensation and other ways like commodities. Since TK is mostly studied under patent laws it is described as existing information or knowledge which is passed from one generation to another by written or unwritten/oral form. The written or documented TK forms the basis of prior art and is patentable under patent laws and since it is publicly available information it cannot be prohibited for commercial usage or any limitations. As per section 3(p) of the Patents Act, TK cannot be considered as an invention or innovation for purpose of patenting.

In order to guard the interest of TK so that Multinational Corporation (MNCs) do not patent traditional knowledge of communities in India, a library called as Traditional Knowledge Digital Library (TKDL) has been established wherein details of traditional and scientific knowledge available from ancient literature and scriptures is arranged according to classification of patents. This was a milestone by the Indian Government to challenge the US patent granted by the United States Patent and Trademark Office (USPTO) to turmeric for its healing characteristic and neem for the antifungal characteristic, which was retracted and eventually revoked. The granting of patent by USTPO was also due to the fact that the ancient Indian texts contain so much literature on medicinal value of plants and resources in Indian languages like Hindi, Sanskrit, Pali and other ancient languages that it cannot be comprehended that foreign patent offices have taken note of the same. Nearly 2000 patents were granted to Indian Ayurveda and Unani medicines worldwide and to resolve this issue in 2005 India published these in five different languages.

4.1. Neem Patent Case⁴

An application for patent was filed in the European Patent Office (EPO) for patent on neem on grounds of the anti-fungal property of neem which was granted. For the novelty and inventive step, it was produced before the EPO a method of using neem

⁴ "India wins Neem Patent Case" *The Hindu*, March 9, 2005, *available at*: https://web.williams.edu/AnthSoc/native/neem.htm (last visited on July 22, 2022).

oil in combination with fungus resulting in control of growth of fungus in plants. India filed an objection on ground of ancient text available in Ayurveda and also contended that neem has been used in India for centuries for its antiseptic and other medicinal properties such as antifungal and antidiabetic. Neem wood is used for making tooth brush as well as combs. Its seeds are also used for its antifungal properties. EPO thus revoked the patent on ground of non-obviousness, existing prior art and lack of inventive step.

4.2. Turmeric Patent

Turmeric herb is a yellow-colored root which is mainly used as spice and also known for home remedies owing to its healing properties such as blood purification, old cough and cold and various skin disease. University of Mississippi got it patented for its wound healing properties in 1995 which was objected by India. India proved its opposition by presenting evidence in ancient literature in various languages. Eventually the USPTO revoked the patent as it was held it was obvious and known.

TK has various elements to it, so a proper examination is required if it can be patented or not. Simply because there exists a certain traditional knowledge it cannot be assumed that it is non-patentable. The uniqueness of TK lies in the traditional passing of information from one generation to another. This very fact does not make it non-patentable. Hence it can be patented and attributed to the true inventor with rights to its true successor. The question that arises is how to establish non obviousness, inventive step and utility for commercial application in claimed inventions for TK developed or invented in Traditional Knowledge system. Also, the bigger question is as to whom the patent has to be granted *i.e.*, identification of appropriate applicant.

In case of TK which is of limited common knowledge within a local or indigenous community, it is whether it can be considered "undisclosed" or not "publicly disclosed" is a legal dilemma. The commercial interest arising out of TK are those of community or individual representing community or state on behalf of its people or community. TK has unique features of ownership rights, custodian rights and equitable rights. Nowadays through bio-piracy traditional knowledge is misappropriated by getting it patented for commercial gains. Due to absence of proper established laws, TK is vulnerable to exploitation.

Indigenous knowledge is more specific and precise knowledge than TK, as it is maintained, disseminated and developed by recognized indigenous people while TK on other hand is said to be held by communities other than those which are non-indigenous. United Nations Declaration on the Rights of Indigenous Peoples has identified and stated the rights of communities and people relating to traditional knowledge.

5. Existing Obligations, Provisions and Possibilities for Protection⁵

Intellectual Property issues regarding protection to TK can be broadly classified under two aspects:

5.1. Defensive Protection

Defensive protection means strategic steps to avoid and deter unrelated third parties to exploit and abuse TK by gaining IP rights over TK. For the same many countries are developing database of TK and classifying them with a purpose to raise an objection to any illegitimate mean to gain a patent on it on grounds of prior art. WIPO has also been extending support by development of toolkit for documentation of TK. WIPO had also amended its "International Patent Classification System" and the "Patent Cooperation Treaty Minimum Documentation."

5.2. Positive protection

Positive protection is studied in two aspects firstly IP rights for TK to avoid being used in an unauthorized way such as Unauthorized usage by patenting of traditional remedy or medicine by pharmaceutical company or any folksong adapted in any documentary or a movie without credit being passed to the community or fair share of profits being shared. Positive Protection also entails active exploitation by originating community itself.

IP protection entails recognition of exclusive rights of rightful holder of TK to the exclusion of those who are prohibited to use it for commercial use without proper authorization. The shielding also includes other nonproprietary forms of protection like

World Intellectual Property Organization, "The Protection of Traditional Knowledge: Updated Draft Gap Analysis;" *available at:* https://www.wipo.int/meetings/en/doc_details.jsp?doc_id=411448 (last visited on July 18, 2022).

incentives for creativity, control over commercial exploitation, moral rights, fair distribution of profits or compensation and legal protection from rivals using unfair means.

Various other conventions, protocol, treaties, declaration can be enunciated as follows:

5.3. Convention on Biological Diversity⁶

Requires that a Contracting Party shall: "Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices."

5.4. Nagoya Protocol⁸

Article 7 states that "In accordance with domestic law, each Party shall take measures, as appropriate, with the aim of ensuring that traditional knowledge associated with genetic resources that is held by indigenous and local communities is accessed with the prior and informed consent or approval and involvement of these indigenous and local communities, and that mutually agreed terms have been established."

Article 5.5 states: "Each Party shall take legislative, administrative or policy measures, as appropriate, in order that the benefits arising from the utilization of traditional knowledge associated with genetic resources are shared in a fair and equitable way with indigenous and local communities holding such knowledge. Such sharing shall be upon mutually agreed terms."

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⁶ The Convention on Biological Diversity, 1992.

⁷ *Id.*, art. 8(j).

⁸ IUCN, "UN Convention on Biological Diversity (CBD)", available at: https://www.iucn.org/theme/global-policy/our-work/convention-biological-diversity-cbd/nagoya-protocol (last visited on July 15, 2022).

Secretariat of the Convention on Biological Diversity Montreal, "The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity", available at: https://www.cbd.int/abs/ (last visited on July 14, 2022).

Article 16 adds:

- "1. Each Party shall take appropriate, effective and proportionate legislative, administrative or policy measures, as appropriate, to provide that traditional knowledge associated with genetic resources utilized within their jurisdiction has been accessed in accordance with prior informed consent or approval and involvement of indigenous and local communities and that mutually agreed terms have been established, as required by domestic access and benefit-sharing legislation or regulatory requirements of the other Party where such indigenous and local communities are located.
- 2. Each Party shall take appropriate, effective and proportionate measures to address situations of non-compliance with measures adopted in accordance with paragraph 1 above.
- 3. Parties shall, as far as possible and as appropriate, cooperates in cases of alleged violation of domestic access and benefit-sharing legislation or regulatory requirements referred to in paragraph 1 above."

5.5. FAO International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

It provides that "each Contracting Party should, as appropriate, and subject to its national legislation, take measures to protect and promote Farmers' Rights, including: (a) protection of traditional knowledge relevant to plant genetic resources for food and agriculture; $(...)^{10}$."

5.6. UN Desertification Convention

It states that "parties shall protect, promote and use relevant traditional and local technology, know-how, and practices and, to that end, undertake to make inventories of such technology, knowledge, know-how and practices and their potential uses with the participation of local populations, and disseminate such information, where appropriate, in cooperation with relevant intergovernmental and non-governmental organizations" (Article 18.2(a)). It provides further those regional activities may include "preparing inventories of technologies, knowledge, know-how

¹⁰ International Treaty on Plant Genetic Resources for Food and Agriculture, 2001, art. 9.

and practices, as well as traditional and local technologies and know-how, and promoting their dissemination and use" (Article 6(b) of Annex II).

5.7. The Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising Out of their Utilization

This Guideline is described in the Executive Secretary's Introduction to the Guidelines as "not legally binding (majority of countries accepted) ... a clear and indisputable authority" provide for some protection of traditional knowledge in recommending that "providers should: ... Only supply genetic resources and/or traditional knowledge when they are entitled to do so" and that "Contracting Parties with users of genetic resources under their jurisdiction ... could consider, inter alia... measures to encourage the disclosure of the country ... of the origin of traditional knowledge, innovations and practices of indigenous and local communities in applications for intellectual property rights."

The objective is to "contribute toward the development of access and benefit regimes that recognize the protection of traditional knowledge" (paragraph 11(j)) and encouragement of "cooperation between Contracting Parties to address alleged infringements of access and benefit-sharing agreements."

5.8. United Nations Declaration on the Rights of Indigenous Peoples

Article 31 of the Declaration stipulates that: "Indigenous peoples have the right to maintain, control, protect and develop their ... traditional knowledge (...), as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such (...) traditional knowledge (...)It further provides that "in conjunction with indigenous peoples, States shall take effective measures to recognize and protect the exercise of these rights."

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United Nations Permanent Forum on Indigenous Issues, "Declaration on the Rights of Indigenous Peoples", *available at*: https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html (last visited on July 20, 2022).

While TK banks on promoting community interests, patent focus on individual monopoly and to maintain a balance for TK innovated patents its necessary that profits are shared for same. Biodiversity Act, 2002 of India tries to strike a chord by section 2 (a) of the Act read with section 6 (2), by bring forth the concept of "benefit sharing" with respect to the product or process derived or made with the help of traditional knowledge for commercial purpose. A patent was granted for Jeevani drug which is manufactured by the plant of same name known for its energy enhancement effects. This plant is planted at western ghats and used by people of Kani tribes who use it for energy and to reduce their weariness. A revenue sharing was done by patent holder to the tribe of an extent of fifty percent.¹²

5.9. Interlaken Declaration on Animal Genetic Resources

It "affirms the desirability, as appropriate, subject to national legislation, of respecting, preserving and maintaining traditional knowledge relevant to animal breeding and production as a contribution to sustainable livelihoods. Linked to the Declaration is the Global Plan of Action for Animal Genetic Resources which aims, among other things, to promote a fair and equitable sharing of the benefits arising from the use of animal genetic resources for food and agriculture, and recognize the role of traditional knowledge, innovations and practices relevant to the conservation of animal genetic resources and their sustainable use, and, where appropriate, put in place effective policies and legislative measures."

Internationally¹³ options identified for protecting TK can be summarized as following:

- Internationally binding instrument or instruments with strong coordination by way of guidelines, laws and conventions;
- ii. Nation should frame laws and focus of capacity building, innovation encouragement and initiatives for practical usage of TKs;

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¹² *Ibid*.

WIPO Report on Fact-Finding Missions on Intellectual Property and Traditional Knowledge (1998–1999), "Intellectual Property Needs and Expectations of Traditional Knowledge holders", *available at*: https://www.wipo.int/edocs/pubdocs/en/tk/768/wipo_pub_768.pdf (last visited on July 20, 2022).

- iii. Clear legal interpretation of existing guidelines for protection of traditional knowledge;
- iv. Internationally passed resolution establishing a norm against abuse of TK and establishing the rights of TK holders on such knowledge.

6. Specific Provision from Indian Legislation Protecting TK in India

- i. Patents Act 1970 (Amendments of 2002 & 2005) sections 3 (b), (c), (d), (f), (h), (i), (j) and (p) The major shortcomings of the Act are its very far off from idea of patenting of TK. This might be because of the reason that while enacting this Act there was very less emphasis on TK and it was an evolving field in Intellectual property arena. Legislature can now revisit and provide amendments which will help and strongly protect TK by specific provisions in this Act which directly help in developing medicines using TK or in various other type of treatment or agriculture systems technologies;
- ii. Geographical Indications Act 1999 sections 11, 24 and 25 It is a very new and nascent area of IP regime in India and this field is still developing and will keep on evolving with time. Over a period of time we can expect TK to be protected and strengthened by strong legislations;
- iii. Trademarks Act 1999 section 29 Not all the marks used in development of TK can be registered as Trademarks as in case of major developed countries hence there is a need to revisit the act by legislature;
- iv. Biodiversity Act 2002 section 6(1) Needs very strong implementation in order to provide support and protection to TK. There is still very little action taken for its strict enforcement even after passage of the act to protect the very essence for which it was enacted. There is a need to strictly enforce the act which will also help in protection of TK wherein many elements of traditional treatment are obtained from.

Many of the medicines used in North East India have been in public domain for centuries therefore negating them to be patented on grounds of prior use. Patent law requires novelty and non-obviousness therefore patent law examines it as a prior art. However, with new innovations and techniques developed over a period of time in medicinal use the methods could be patented. In a *sui generis* system of protection of

the invention like Peruvian law where it defines collective knowledge under article 2(b). In Panama, the community rights of indigenous people are recognized on their traditional work, methods, process and procedures.

The Peruvian¹⁴ law is one of the most comprehensively drafted laws on prior informed consent (PIC) which implies for obtaining prior informed consent from the indigenous people possessing the traditional knowledge only for purpose of commercial, scientific and industrial application. The collective group or community will inform the traditional knowledge holders of the negotiations and keep interest of the community priority. Peruvian laws and Panama laws can be used by law makers and legislators for framing of legal framework for protection of traditional knowledge of North East India.

7. Conclusion

TK has been contributing to our culture and society from time immemorial. Not only it's a national and cultural heritage but also a treasure of resource which can be developed more and more to benefit the society and country as well as providing economic benefits to the contributing community or indigenous people. However, a check and balance need to be maintained for its exploitation unlike patent wherein its entire motive is profit multiplication and commercial exploitation. These rights should be protected by every nation as its solemn duty for maintain socio-economic balance and rights of the native communities. For protecting TK of North East India, the only ways are sui generis system of protection of industrial property from western world who want to exploit the same by way of patenting. Though in sue generis system it often poses a challenge that some TK can be protected under existing provisions while some cannot. Existing legislative provisions are inadequate to protect traditional knowledge in current intellectual property regime. The need is to study the aspect of the protection of some TK under existing IP laws and to make legislative amendments for the others which are no protected by current laws thus bridging any gap which is left. Though it seems a mirage but the way world is developing and major thrust is being given on intellectual property and its value it will be made possible soon. For that to be

Law Introducing a protection Regime for the Collective Knowledge of Indigenous Peoples Derived from Biological Resources, Peru- Law No. 27811, art. 6.

achieved till that time there is a need to address the socio-economic impact of misuse of TK owing to differential gap in TK and IP framework. The legislature should strive to protect the interest of traditional knowledge holders only then TK can be preserved and protected by its misuse by multinationals.

Though with establishment of TKDL¹⁵ and creating provisions for protection of TK it has emerged to be a real useful resource which needed to be exploited at the same time in no way the rightful ownership of indigenous communities or holders of traditional knowledge should not be jeopardized. India has long way to go in the protection of these rights because it's a nation with its roots in ancient knowledge not only in field of medicine and remedies but in other aspects of traditional knowledge also.

[&]quot;Bio-piracy of Traditional Knowledge", *available at:* http://www.tkdl.res.in/tkdl/langdefault/common/Biopiracy.asp?GL=Eng (last visited on July 12, 2022).