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THE ROLE OF TRADITIONAL KNOWLEDGE DIGITAL LIBRARY IN PROTECTION OF INDIAN TRADITIONAL KNOWLEDGE: A CRITICAL ANALYSIS

Manjari Chandra [1], Dr. Rohit P Shabran [2]

[1] Research Scholar, ILS, SRMU
[2] Director, Institute of Legal Studies, Shri Ramswaroop Memorial University, Lucknow Deva Road, Barabanki, (U.P.) India

ABSTRACT

This research analyzes the pivotal role of Traditional Knowledge Digital Libraries (TKDLs) in safeguarding Indian traditional knowledge, critically analyzing their impact on preservation, accessibility, and legal protection. Examining the key features and functionalities of existing TKDLs, we assess their effectiveness in documenting and disseminating traditional knowledge. The study delves into the legal and policy frameworks at national and international levels, evaluating their support and potential hindrances to utilizing TKDLs for protection. Additionally, we explore the extent to which these digital repositories empower indigenous communities and practitioners while respecting cultural sensitivities and intellectual property rights. Challenges in digitization and management of traditional knowledge are scrutinized, seeking solutions for ethical considerations. The research also gauges stakeholder perspectives, including those of indigenous communities, policymakers, researchers, and legal experts, to understand the perceived effectiveness and relevance of TKDLs. This paper covers a number of topics related to the Traditional Knowledge Digital Library of India (TKDL), such as its contribution to the preservation of traditional knowledge, safeguarding and disseminating traditional knowledge, the database's current status, advantages of TKDL, instances of bio-piracy of Indian traditional knowledge, and the organization's most notable accomplishments in this area.

Corresponding Author

Manjari Chandra,
manjari116@gmail.com

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1. INTRODUCTION

Indigenous knowledge (IK), local knowledge (KL), and traditional knowledge (TMK) all typically relate to the developed, long-standing customs and practices of particular indigenous, local, or regional cultures. The wisdom, knowledge, and teachings of these cultures are also included in traditional knowledge. Traditional wisdom has often been transmitted orally down through the centuries. A portion of traditional knowledge is conveyed via folklore, tales, songs, rituals, and even laws. Different methods are often used to convey other types of traditional knowledge.

The TKDL is a database that compiles and organizes data on medical procedures and prescriptions from the four primary schools of traditional Indian medicine: Siddha, Unani, Yoga, and Ayurveda. Although the TKDL was established in 2001, its origins may be discovered in two highly publicized patent lawsuits from the 1990s: the neem case and the

turmeric case. Two University of Mississippi researchers received a patent in 1995 about the use of turmeric, or Curcuma longa, for wound healing. The US Patent and Trademark Office invalidated the patent two years later due to objections from the Council of Scientific and Industrial Research (CSIR) in India. The CSIR stated that the invention relied on customary methods that had been used in India for millennia.

The Indian Traditional Medicine System has been organized and categorized by the TKRC into thousands of subgroups for Ayurveda, Unani, Siddha, and Yoga. The TKRC made it possible to incorporate 200 sub-groups under A61K 36/00 in the International Patent Classification, as opposed to the few sub-groups on medicinal plants that were previously available under A61K 35/00. This improved the quality of prior art searches and examinations in relation to the field of traditional knowledge patent applications.

International standards and specifications for configuring TK databases in accordance with TKDL requirements have also been established by TKDL. The Intergovernmental Committee (IGC) of the World Intellectual Property Organization (WIPO) on Intellectual Property and Genetic Resources, Traditional Knowledge, and Expression of Folklore endorsed this in 2003 at its fifth session.

2. SIGNIFICANCE OF THE STUDY

India has abundant biogenetics expertise. Traditional wisdom may solve many modern problems, especially in agriculture, biotechnology, and healthcare. Traditional knowledge may provide economic benefits by providing crucial leads for practical items and procedures. Piracy occurs when outside party profit from customary knowledge. Bio piracy and patenting traditional knowledge steal indigenous peoples' creativity and ingenuity and deny them the economic opportunities they need to survive that are based on biological variety and traditional knowledge[1].This study holds paramount significance as it critically examines the role of Traditional Knowledge Digital Libraries (TKDLs) in safeguarding Indian traditional knowledge. In an era of rapid digitization, understanding the efficacy of these libraries is crucial for preserving cultural heritage. The findings can inform policymakers, legal experts, and indigenous communities about the strengths and limitations of existing frameworks. Additionally, the study contributes to the discourse on ethical considerations in digital knowledge management, addressing potential challenges. By shedding light on stakeholder perceptions, it offers insights for collaborative strategies, fostering a more inclusive and effective approach to protect and promote India's rich traditional knowledge.

3. RESEARCH OBJECTIVES

1) To examine the Effectiveness of Traditional Knowledge Digital Library (TKDL).
2) To assess the Legal Framework Surrounding Traditional Knowledge Protection.
3) To explore Stakeholder Perspectives on Traditional Knowledge Digital Library.
4) To identify Challenges and Gaps in the Implementation of TKDL.
5) To propose Recommendations for Enhancing TKDL's Role in Knowledge Protection.

4. RESEARCH QUESTION

1) To what extent have Traditional Knowledge Digital Libraries facilitated the documentation, dissemination, and accessibility of Indian traditional knowledge, and how has this impacted the empowerment and recognition of indigenous communities and practitioners?
2) What challenges and ethical considerations arise in the digitization and management of Indian traditional knowledge within Traditional Knowledge Digital Libraries, and how can these challenges be effectively addressed to ensure respect for cultural sensitivities and intellectual property rights?
3) How do stakeholders, including indigenous communities, policymakers, researchers, and legal experts, perceive the effectiveness and relevance of Traditional Knowledge Digital Libraries in the protection of Indian traditional

[1] For Example: use of indigenous knowledge of medicinal plants for patenting by medical companies without recognizing the fact that the knowledge is not new, or invented by the patenter, and thereby the piracy deprives the indigenous community to the rights to commercial exploitation of the technology that they themselves had developed

knowledge, and what recommendations can be made to enhance their engagement and collaboration for a more comprehensive approach?

5. RESEARCH METHODOLOGY

The recommended technique will mostly be doctrinal in character. The goals of the study must be explored using analytical methods. The research mainly relies on national laws, international agreements, and policy documents. In addition to international treaties, the study is based on international conventions, other legal documents, publications from the WIPO, and other sources. The relevant laws and regulations that are in effect in India and other countries must also be carefully reviewed. Using a modified version of the doctrinal research methodology, the conclusion will be reached by looking at and analyzing legal ideas and principles. In order to advise and determine if a model law suited for the preservation of traditional knowledge in India may be brought forward in India, it is also necessary to research various legislations relevant to the protection of traditional knowledge Digital Library in other nations.

6. LITERATURE REVIEW

Over the course of around 5,000 years, the nation of India has fostered a civilizational heritage. The four Vedas, 108 Upanishads, two epics, the Bhagavad-Gita, the Brahma sutras, eighteen Puranas, the Manusmriti, the Kautilya Shastra, and smritis are among the oldest texts of India. India is among the top 12 most biodiverse nations in the world in terms of biodiversity. India is home to 7–8% of the world's known species while making up just 2.4% of the planet's geographical area. India is blessed with a diverse agro-climatic environment. There are 26 agroclimatic zones in the globe, with 16 of them found in India alone. The Trans-Himalayan region and the coastal regions of Kerala, Andaman, and Nicobar are the starting points of India's diverse agro-climatic zones. These places support a wide variety of medicinal plants, including herbs, shrubs, tubers, mangroves, and rhizomes. Over 47,000 plant species and 81,000 animal species have been identified by the Indian Zoological and Botanical Surveys. (Simeone)

The theft of biomedical information from traditional and indigenous groups or people is known as bio-piracy. The phrase may also refer to a violation of a contract that forbids using traditional knowledge for purposes other than those intended by the supplier, such as bioprospecting conducted without the approval of the local community. (Gupta, 2005)

Only seven medicinal plants of Indian origin were included in over 80% of the 4,896 references to specific plant-based medicinal patents in the US Patent Office in 2000, according to research conducted by CSIR.

After three years, the US, UK, and foreign patent office registrations had about fifteen thousand patents covering similar medications. This number increased to 35,000 in 2005, indicating the developed world's evident interest in learning about the developing world. The fact that none of the patent examiners are from emerging nations is convenient, since it gives them almost carte blanche to pilfer local knowledge from the Old World. (Martin)

7. TRADITIONAL KNOWLEDGE DIGITAL LIBRARY

TKDL has been considered to be quite helpful as far as its application in Europe is taken into consideration. It is claimed that in its initial couple of years only TKDL was able to help in rejecting 36 patent applications and up till 2015 out of 189 traditional knowledge in the European Patent Office, 17 were rejected, 30 were deemed withdrawn, 31 were abandoned and 21 were accepted. The remaining 90 applications were under consideration around 2016[2]. As one can see from the numbers, TKDL does not seem to have an outstanding success considering the fact that a great number of patent applications were undecided till 2016 and that too for a long period of time[3]. Although, a look at the EPO website does show that most of them have been resolved as of now but as mentioned below there is at least one application which was filed in 2008 but was under scrutiny until recently[4]. Also, it seems appropriate to state at this point that the

[2] Abraham S & and Marda V, The Digital Protection of Traditional Knowledge: Questions Raised by the Traditional Knowledge Digital Library in India, https://www.giswatch.org/ sites/default/files/gw2016-thematic-traditional.pdf (accessed on 12 January 2024).

[3] Patent Examiner's view on TKDL Reference's in Examination Report, http://www.tkdl.res.in/tkdl/langdefault/Common/ExaminerReport.asp?homepage=sub (accessed on 12 January 2024).

[4] Tanaka M, Visceral Fat Accumulation Inhibitor, Application No. EP1927361 (Morning Milk Industry Co. Ltd., Tokyo), Grant of Patent Intended as of 28 October 2018. https://register. epo.org/application?number=EP06810359 (accessed on 11 January 2024).

applications which were withdrawn should not be considered as a victory for TKDL, because there are cases where these withdrawn applications go for re-examination and patent is granted[5].

At present, as per the approval of Cabinet Committee on Economic Affairs, access of TKDL is available to thirteen Patent Offices (European Patent Office, United State Patent & Trademark Office, Japan Patent Office, United Kingdom Patent Office, Canadian Intellectual Property Office, German Patent Office, Intellectual Property Australia, Indian Patent Office, Chile Patent Office, Intellectual Property Corporation of Malaysia, Rospatent- Intellectual Property Office of Russia, Peru Patent Office and Spanish Patent and Trademark Office), under TKDL Access (Non- disclosure) Agreement. As per the terms and conditions of the Access agreement, examiners of patent office can utilize TKDL for search and examination purposes only and cannot reveal the contents of TKDL to any third party unless it is necessary for the purpose of citation. TKDL Access Agreement is unique in nature and has in-built safeguards on Nondisclosure to protect India's interest against any possible misuse.

In addition, pre-grant oppositions are being filed at various International Patent Offices, along with prior-art evidences from TKDL. Significant impact has already been realized. So far more than 230 patent applications have either been set aside/ withdrawn/ amended, based on the prior art evidences present in the TKDL database without any cost and in few weeks/months of time, whereas APEDA had to spend about seven crores towards legal fee only for getting few claims of Basmati rice patent revoked.

8. TRADITIONAL KNOWLEDGE DIGITAL LIBRARY- A WAY TO STOP THE MISAPPROPRIATION OF TRADITIONAL KNOWLEDGE

TKDL contains information from Indian Systems of Medicine, viz., Ayurveda, Unani, Siddha, Sowa Rigpa as well as Yoga available in public domain. For this, traditional knowledge from the existing literature existing in local languages such as Sanskrit, Urdu, Arabic, Persian and Tamil in converted into digitized format, and is available in five international languages including English, German, Spanish, French and Japanese. Traditional Knowledge Resource Classification (TKRC), an innovative structured classification system for the purpose of systematic arrangement, dissemination and retrieval was evolved for about 5,000 subgroups against few subgroups available in International Patent Classification (IPC), related to medicinal plants. The information is structured under section, class, subclass, group and subgroup as per the International Patent Classification (IPC) for the convenience of its use by the international patent examiners. The TKDL database comprises about 3.6 lakh formulations/ practicesthat has been transcribed from ISM and Yoga texts.

Each text is read, medicinal formulation/ practice identified and converted into a structured language using Traditional Knowledge Resource Classification by subject (Ayurveda, Unani, Siddha, Sowa Rigpa or Yoga) experts. The codes are then filled into the data entry screen. The content (prior art) from ancient texts are also saved in the database. The translated version of all the TKRC codes is ported in the database. The abstraction is done by the subject experts. The codes once saved in meta data directory are converted in different languages based on Unicode technology. The formulations are converted into English, German, French Japanese and Spanish languages. The converted format of the formulation is readable and can be understood in general by all.

As previously indicated, the TKDL programme transforms text in local languages into many languages along with its corresponding categorization system, or TKRC. It should be mentioned that TKDL is a knowledge-based conversion approach rather than a transliteration, in which data abstraction is done once and then transformed into several languages utilising Unicode and metadata methods. Modern terminology is also adapted from traditional terms. For instance, fever is now called Jwar, curcuma longa is called turmeric, smallpox is called mussorika, etc.

TKDL includes a search interface providing full text search and retrieval of traditional knowledge information on IPC and keywords in multiple languages. The search features include single or multiple word searches, complex Boolean expression search, Proximity search, Field search, Phrase search, etc in the form of simple and advance search options. Simple search lets the user search a combination of keywords. Advance search lets the user search using Boolean expressions, using the expressions like "near", "and", "and not". Searches are also available on IPC and TKRC codes.

Since the database will include information on both modern and local names in a language and format that Patent Examiners can comprehend, TKDL serves as a bridge between formulations that already exist in local languages and a

[5] Rathi M, TKDL: A Success Really, https://spicyip.com/ 2012/04/guest-post-tkdl-success-really.html (accessed on 12 January 2024).

Patent Examiner at a worldwide level. It is anticipated that the gap in previous art conventional knowledge availability would be filled.

9. IPR AND TRADITIONAL MEDICINE

1) THE NEEM CASE

W.R. Grace's patent award was a momentous occasion for India and questioned the patent system's rigidity. The business patented a pesticidal formulation including azadirachtin, the active chemical in neem plants, in the US and EU[6][7]. The applicant acknowledged that neem's pesticidal properties make it difficult to store azadirachtin without it. The applicant was only allowed to employ azadirachtin in the storage method detailed in the application, and the US patent only covered a portion of their invention.

The EPO and USPTO opposed the invention's award via re-examination and post-grant opposition processes, respectively, due to its controversy. The European Patent Office upheld the judgement because the issued patent lacked inventive step and originality[8].

Neem extracts can be used against hundreds of pests and fungal diseases that attack food crops; the oil extracted from its seeds can be used to cure cold and flu; and mixed in soap, it provides relief from malaria, skin diseases and even meningitis. In 1994, European Patent Office (EPO) granted a patent (EPO patent No.436257) to the US Corporation W.R. Grace Company and US Department of Agriculture for a method for controlling fungi on plants by the aid of hydrophobic extracted Neem oil. In 1995, a group of international NGOs and representatives of Indian farmers filed legal opposition against the patent.

They submitted evidence that the fungicidal effect of extracts of Neem seeds had been known and used for centuries in Indian agriculture to protect crops, and therefore, was unpatentable. In 1999, the EPO determined that according to the evidence all features of the present claim were disclosed to the public prior to the patent application and the patent was not considered to involve an inventive step. The patent granted on was Neem was revoked by the EPO in May 2000. EPO, in March 2006, rejected the challenge made in 2001 by the USDA and the chemicals multinational, W. R. Grace to the EPO's previous decision to cancel their patent on the fungicidal properties of the seeds extracted from the neem tree.

2) THE 'JEEVANI' AND 'KANI' TRIBES

Local innovation benefit-sharing model experiments are starting. India exemplifies. Trichopus zeylanicus (Arogyapaacha), a plant from South-Western India, was used to make a medication. Kerala's Tropical Botanic Garden and Research Institute (TBGRI) uncovered the herb, which boosts immunity and vitality. Scientists extracted, examined, and mixed the element into "JEEVANI," the source of life. A respected Kerala-based Ayurvedic medicinal company makes the tonic.

3) TURMERIC PATENT

Indian immigrants Suman K. Das and Hari Har P. Cohly received US Patent 5,40,504 for treating wounds using turmeric on March 28, 1995. US-based University of Mississippi Medical Centre received the patent[9]. This patent discovers that a high dose of turmeric topically and orally speeds wound healing. Patents must fulfil inventiveness, non-obviousness, and usefulness requirements. The patent is invalid if the published art addresses the allegations. CSIR found 32 references, some of which were over a century old and published in Sanskrit, Urdu, and Hindi, proving that India widely acknowledged this invention before submitting this patent[10]. On October 28, 1996, CSIR requested the USPTO reexamine the patent. The examiner dismissed all claims again on November 20, 1997, citing their predictability and obviousness. On April 21, 1998, the re-examination certificate was issued, ending the process.

In 1995, two expatriate Indians at the University of Mississippi Medical Centre (Suman K. Das and Hari Har P. Cohly) were granted a US patent (no.5, 401,504) on use of turmeric in wound healing. The Council of Scientific & Industrial Research (CSIR), India, New Delhi filed a reexamination case with the US PTO challenging the patent on the grounds of

[6] Menon Ramesh, 'Traditional Knowledge receives a boost from the government' (2007).
[7] 'Cases of Misappropriation of Traditional Knowledge' (Shodhganga.com) accessed 18 July 2023.
[8] Mangala Hirwade, 'Protecting Traditional Knowledge Digitally: A Case Study of TKDL' (2010)
[9] Anuradha, R.V, 'Biopiracy and Traditional Knowledge' The Hindu (20 May 2001)
[10] Saipriya Balasubramanian, 'Traditional Knowledge And Patent Issues: An Overview Of Turmeric, Basmati, Neem Cases' (Singhassociates.in, 2017)

existing of prior art. CSIR argued that turmeric has been used for thousands of years for healing wounds and rashes and therefore its medicinal use was not a novel invention. Their claim was supported by documentary evidence of traditional knowledge, including ancient Sanskrit text and a paper published in 1953 in the Journal of the Indian Medical Association. Despite an appeal by the patent holders, the US PTO upheld the CSIR objections and cancelled the patent. The turmeric case was a landmark judgment case as it was for the first time that a patent based on the traditional knowledge of a developing country was successfully challenged. The US Patent Office revoked this patent in 1997, after ascertaining that there was no novelty; the findings by innovators having been known in India for centuries.

4) AYAHUASCA

For generations, Shamans of indigenous tribes throughout the Amazon basin have processed the bark of B. caapi Mort. to produce a ceremonial drink known as “Ayahuasca”. The Shamans use Ayahuasca (which means “wine of the soul”) in religious and healing ceremonies to diagnose and treat illness, meet with spirits, and divine the future.

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

The Coordinating Body of Indigenous Organisations of the Amazon Basin (COICA), which represents more than 400 indigenous tribes in the Amazon region, along with others, protested about a wrong patent that was given on a plant species. They protested that Ayahuasca had been known to natives of the Amazon rainforest and it is used in traditional medicine and cultivated for that purpose for generations, so Miller could not have discovered it , and should not have been granted such rights, which in effect, appropriated indigenous traditional knowledge. On reexamination, USPTO revoked this patent on 3rd November 1999. However, the inventor was able to convince the USPTO on 17th April 2001, and the original claims were reconfirmed and the patent rights restored to the innovator.

10. EXPANDING TKDL DATABASE ACCESS TO NON-PATENT OFFICE USERS

Granting "Widening access of the Traditional Knowledge Digital Library (TKDL) database to users, besides patent offices" has been authorized by the Union Cabinet, which is headed by Prime Minister Narendra Modi.

With the following advantages, the TKDL database's public release will herald a new era for Indian traditional knowledge:

- The action will facilitate the wider adoption of Indian traditional medicines and encourage new manufacturers and innovators to build profitable businesses based on India's valuable knowledge heritage.
- It will also help integrate and coopt traditional knowledge with current practices to enhance trade and innovation[11].
- The TKDL has the capacity to serve a wide range of users, including corporations, public and private research institutions, educators, students, and other entities such as knowledge holders, ISM practitioners, patent holders and their legal representatives, and the government.
- Additionally, the New Education Policy 2020 will utilise the TKDL to foster thought leadership and knowledge leadership through Bharatiya Gnana Parampara[12].

11. HUMAN RIGHTS PROTECTION OF TRADITIONAL KNOWLEDGE

Two intellectual property concepts preserve traditional knowledge. Protecting traditional knowledge from use or IP claims is the first step. Several cultures have created traditional knowledge databases to verify their knowledge is prior art and deter bio-piracy.

Databases make conventional knowledge public, even if they prohibit people from claiming rights to it. This is problematic since many civilizations want to retain such old knowledge. Traditional or customary laws governing the use of traditional knowledge may vary from their country's or the world's intellectual property rights framework.

[11] About TKDL | Council of Scientific & Industrial Research | CSIR | GoI.
[12] 4 https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=1852530.

Disclosure breaks these norms. "Positive protection" legalizes customary knowledge. This is done using existing laws or by passing new sui generis legislation.

Some argue that granting these groups perpetual rights may violate the US Constitution. They also oppose utilitarianly to legalizing traditional knowledge. Traditional knowledge, such as medicinal treatments, may benefit others while retaining some exclusive rights.

Other concerns include resource and advantage distribution. Local and indigenous groups say they seldom use development incentives. Spirituality and culture impact their information utilization. If this information is misused, it may violate their cultural and communal norms.

Several constitutional articles and statutory laws protect these ideas, and the UN is slowly acknowledging them as distinct human rights. Similar to how local and indigenous people have claimed that public assertions about their knowledge without their consent were an appropriation of their identity and history and a violation of their fundamental, inalienable, and collective human rights.

12. ACTIONS TAKEN TO PRESERVE INDIGENOUS MEDICINAL SYSTEMS' ANCIENT AND TRADITIONAL KNOWLEDGE

All patent offices worldwide that have signed Non-Disclosure access agreements with the CSIR are granted access to the Database in accordance with the current clearances held by the Government of India. The TKDL database is accessible to fourteen patent offices, including the Indian Patent Office (Controller General of Patents, Designs & Trade Marks). Based on the TKDL evidences, the CSIR-TKDL Unit also submits pre-grant oppositions and third-party remarks on patent applications pertaining to Indian traditional knowledge.

The defensive protection provided by TKDL is regarded as a worldwide standard and has proven successful in preventing the theft of Indian traditional knowledge. As of March 25, 2022, a total of 418885 formulations—119269 in Ayurveda, 236399 in Unani, 54689 in Siddha, 4151 in Yoga, and 4377 in Sowa Rigpa—have been entered into the TKDL database[13].

Indian traditional knowledge has been safeguarded as of March 25, 2022, when 265 patent applications were either withdrawn, considered withdrawn, altered, or set aside based on TKDL evidence[14].

A Non-Disclosure Agreement was signed by the Council of Scientific and Industrial Research (CSIR)-Traditional Knowledge Digital Library Unit and the National Biodiversity Authority to assess and determine potential ways to incorporate data from the People's Biodiversity Register (PBR) into the TKDL database. A mechanism for formally documenting and maintaining detailed data on the availability and understanding of biological resources in the area, whether for medicinal or other purposes, is the Register[15].

13. CURRENT STATUS: TKDL DATABASE

It is a database that includes an understanding tool for the codified information that is now in place for Indian medical systems, such as Ayurveda, Siddha, Unani, and yoga, as previous art. It's not a usage or diagnostic database. Additionally, the Books on Indian Systems of Medicine, which serve as TKDL's knowledge source, constitute the prior art; TKDL is not the prior art in and of itself.

On the other hand, TKDL has digitised photos of the original books' drug formulas.

More than two lakh formulas from Ayurvedic, Unani, Siddha, and Yoga books are covered by TKDL. It is important to remember that the TKDL does not include all of the data found in the Indian Systems of Medicine. TKDL is a dynamic database rather than a complete one, since formulas will be added and modified often based on input from database users. All IPR offices globally now have access to the whole database, which will help with prior art searches and deter bio-piracy.

[13] https://pib.gov.in/PressReleasePage.aspx?PRID=1809661
[14] https://pib.gov.in/PressReleasePage.aspx?PRID=1809661
[15] Ibid.

The official TKDL website offers access to a representative database with 1200 formulas drawn from several ancient sources of the Ayurvedic, Unani, and Siddha schools of medicine. It contains two hundred easily accessible Siddha medicines, five hundred Unani formulations, and five hundred Ayurvedic medications.

14. CONCLUSIO

When considering the TKDL as a countermeasure to the theft of traditional knowledge, it becomes clear that there are benefits and drawbacks to utilizing databases to preserve traditional knowledge. On the one hand, the TKDL demonstrates how a well-thought-out documentation and categorization system may recognize traditional knowledge as prior art, close the alleged gap between formal and informal knowledge systems, and stop such information from being misappropriated. Moreover, the IPC's modifications to include conventional medical knowledge imply that the international patent system and its organizations are flexible in modifying their documentation requirements to incorporate information from non-Western knowledge traditions.

Since TKDL is built on a limited access paradigm, it is highly recommended that it be made publicly accessible. This will support scientists in their research and inform applicants about previous research in the subject in which they are working. Although there have been security issues, they are manageable.

The study's findings emphasize the need of ongoing assessment and modification of TKDLs in order to address changing issues. To maintain the relevance and sustainability of TKDLs in the ever-changing field of traditional knowledge preservation, stakeholders should be encouraged to engage in continuous communication, capacity-building, and awareness-raising. In the end, the research recommends a comprehensive and cooperative approach to use digital platforms in safeguarding and advancing the diverse body of Indian traditional knowledge for future generations.

CONFLICT OF INTERESTS

None.

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None.

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