



## Traditional Knowledge - From Protection to Promotion: A Perspective

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Traditional Knowledge (TK) including cultural expressions constitute a plethora of knowledge, and practices, both in the form of documented classical text or oral traditions and folklores which intertwined with the day to day lives and livelihood of the associated knowledge holders and indigenous communities, and has been evolving with time. However, rapidly shifting economic, political, cultural and climatic scenarios world over, are affecting traditional knowledge systems and the associated communities. In addition, neglect, erosion, misappropriation, and miscommunication of TK have been lately the major concerns worldwide. There have been rising recognition of systematic documentation and evidence-based scientific understanding of TK. By integrating TK with contemporary science based on modern scientific parameters, and its effective communication can help in addressing various pressing global concerns such as affordable health, climate change, biodiversity, sustainable agriculture and livelihood security to people and deprived sections of the society.

There have been several initiatives internationally and in India towards protecting, preserving and propagating TK. The Council of Scientific and Industrial Research (CSIR), has led the efforts for protection and preservation of Indian TK not only by supporting R&D rooted in TK but also through its various initiatives such as the Wealth of India, Traditional Knowledge Digital Library (TKDL), Indian Journal of Traditional Knowledge (IJTK) and Scientifically Validated Societal Traditional Knowledge (#SVASTIK) initiative. This paper therefore delves into various aspects of TK, related challenges, and CSIR initiatives for documenting and communicating India's traditional knowledge. India should tap the potential of its rich heritage and leverage on scientifically validated TK/practices for a sustainable future, wherein effective TK communication can be a concrete stride towards it.

**Keywords:** Communication, Documentation, Indian Knowledge Systems, Protection, Scientific Validation, SVASTIK, Traditional Knowledge.

### Introduction

Traditional knowledge (TK) is referred to as the indigenous knowledge, know-how, skills and practices, which are often local and context specific, are developed, acquired, and sustainably propagated within a community and transmitted from generation to generation, often outlining its cultural or spiritual identity<sup>1,2</sup>. It is an invaluable asset of indigenous communities which are accumulated through observation of nature and their interaction with the environment, and often are closely intertwined with lives and livelihoods of the knowledge holders<sup>1</sup>. However, TK has often been regarded as a free resource, and has been continually exploited owing to several factors, such as globalisation, urban migration, and the growing influence of modern technology and changing lifestyle. Consequently, globally the Traditional Knowledge Systems (TKS) are fast losing

their natural resources and at risk of becoming potentially extinct.

India, a land of cultural and linguistic diversity boasts of an abounding legacy of traditional and intellectual heritage often referred to as the "Indian knowledge tradition" that has been acquired, maintained and passed down through several millennia dating back to over 5000 years in the Indian sub-continent<sup>3,4</sup>. In this context, the systematic transfer of Indian knowledge tradition from one generation to another dating back to several millennia and traversing various disciplines including science and technology is known as the Indian knowledge system (IKS). IKS is thus a structured system and a method of knowledge transfer, which accounts for gathering, preserving and disseminating Indian knowledge to different parts of the world<sup>3,5</sup>. It is based on the Vedic literature such as the *Vedas*, the

*Upavedas*, and the *Upanishads*. IKS comprises knowledge (*Jnan*), science (*vignan*), philosophy (*darshan*) evolved out of conscientious experience, observation, experimentation and analyses<sup>6</sup>. Rooted in universal interconnections, the traditional knowledge of India is often transmitted orally, or through artistic traditions, imitations and demonstrations, or are drawn from various codified or classical texts and manuscripts written in various Indian languages which serve as repositories of accessible knowledge in various disciplines such as mathematics, astronomy, chemistry, metallurgy, architecture, agriculture, culinary practices, medicine, education, philosophy, biodiversity and ecology, amongst many others<sup>6</sup>. In fact, many of such knowledge continue to thrive in the present times as well. For example various Indian medical systems such as Ayurveda, Yoga, Siddha, Sowa rigpa, Unani and folk medicines have stood strong, over thousands of years and so do some of our classical culinary traditions, and traditional agricultural practices<sup>7-9</sup>.

Unfortunately, these invaluable resources over the years have been facing destruction and are fighting for their survival. The decline of IKS originated from a convergence of historical, social, and cultural transformations that gradually destroyed the old knowledge systems, the very foundation of civilisation in the Indian subcontinent. Some of the prominent reasons for the loss of TK/practices have been globalisation, urban migration, western education, growing influence of modern technology, changing lifestyle, lack of interest among younger generation to learn traditional skills, death of the TK holder, loss of genetic diversity, fragmentation of laws for TK protection, lack of systematic documentation, lack of evidence-based TK authentication, extinction of indigenous languages etc.<sup>10</sup>. Further, considering the diverse nature of the IKS, together with diverse languages, regions, demography and other such factors, the actions and initiatives to mainstream it have been either sporadic or limited. More intensive and systematic efforts are required to nurture TK and, wherever possible and relevant, bridge it to the present-day knowledge systems. It is therefore imperative that systematic documentation, scientific validation and effective communication of such knowledge can play a crucial role not only in the protection and promotion but also instilling confidence in society in our intellectual heritage. This paper thus delves into the TK

documentation, validation and communication efforts in India.

### **Need for traditional knowledge preservation and protection**

Indigenous people and local communities possess a vast reservoir of TK and for them TK/practices is crucial in various aspects of their lives and a source of livelihood, world over. as for example, indigenous peoples can predict weather and impending disasters using various social, bio-physical and ecological indicators<sup>11</sup>. Similarly, Japan's Masanobu Fukuoka's natural farming method, emphasises on utilising traditional wisdom for developing sustainable agricultural systems through maintaining ecological balance, minimising soil erosion, and carbon sequestration<sup>12</sup>. In Indian context also, there have been several TK/practices that have found relevance even today. As for example, *Naulas*, which are basically small traditional step wells, are one of such age-old technologies that help manage water crisis in Almora, a hill station in Uttarakhand, India<sup>13,14</sup>. Sacred groves which are the tracts of forest that are left untouched by the local inhabitants, harbour rich biodiversity, and are protected by the local people due to their cultural and religious beliefs, are another example of relevant TK for biodiversity conservation<sup>15</sup>. Traditional ecological knowledge which these sacred groves hold within themselves is truly scientific. Sacred groves act as a treasure house for researchers and environmentalists who can test various ecological models in order to set examples of traditional methods for conserving the forests at a large scale. Many indigenous communities across the globe use herbal medications to treat various kinds of ailments and often it serve as a source of their livelihood<sup>16,17</sup>. Preserving such TK may appear uncomplicated, but there are numerous issues related to intellectual property (IP) protection of such knowledge owing to the fact that TK is being continually evolved influencing global intellectual traditions. Indigenous communities through TK/practices have successfully achieved a harmonious relationship between human needs and nature, effectively managing resources and fulfilling local requirements as well as creating livelihood opportunities in this fast changing world. Hence, it is crucial to preserve and responsibly exploit our biodiversity and related TK. Furthermore, our traditional knowledge systems (TKS) are degrading quickly because of globalisation and indiscreetly

turning to the Western lifestyle. Global climate change, rapid biodiversity loss, and emerging health issues worldwide, further strengthens the importance of TKS that embody untapped resources warranting systematic study, protection, and integration into modern science. Infact various indigenous communities such as Dejen in Ethiopia, Tharu in Nepal, communities in Sahel region of Ghana and those of Masvingo in Zimbabwe have learnt to combine indigenous knowledge with scientific information in weather forecasting<sup>18-21</sup>. Furthermore, such knowledge is frequently out of the average person's reach and, even when it is, it is rarely understood. This calls not only for protection and preservation of our cultural and scientific heritage but also its documentation, validation and effective communication.

#### **Need for traditional knowledge documentation and scientific validation**

Documenting traditional knowledge is now extensively deliberated as a means of ensuring the sociocultural and economic benefits and securities of indigenous communities and local people<sup>1</sup>. It is also a way of preserving the knowledge inherited and preventing its misappropriation and biopiracy. It has transpired as a tool that can help inhibit damage and/or erosion of TK, sustain TK over time, maintain benefit sharing among TK holders and the beneficiaries, and eventually protect TK from unsolicited uses. In addition to the protection of TK, documentation serves multiple purposes. It can be a beneficial instrument as part of an inclusive approach for TK protection and widening recognition for indigenous people and their knowledge<sup>22</sup>. It may also aid in generating substantial aids such as monetary or in-kind benefits; organised and systematised (preserved) TK for future generations; collaborations among various stakeholders; capacity building and scholastic uses of registers or databases developed; and protection of intellectual property rights for TK or products related to it<sup>1</sup>. TK documentation thus, not only helps in preserving cultural heritage but also supports biodiversity conservation, public health, and sustainable development<sup>23-24</sup>. It has been reported that documentation of traditional herbal knowledge, accumulated over centuries by indigenous and/or local communities, may serve as a valuable repository of information about the medicinal and aromatic properties of various plants detailing their

identification, use and management for health and well-being<sup>25-26</sup>. Therefore, the methodical recording of traditional knowledge is essential for preserving and protecting TK.

Nonetheless, scientific validation must compliment TK documentation in order to ensure safety, efficacy and reproducibility of such knowledge. Today, the implementation of technology and practices primarily relies on empirical proof. Therefore, it becomes imperative to rigorously substantiate TK-based claims on modern scientific parameters, whether *in vitro*, *in vivo*, pharmacological, toxicological, clinical trials, meta analysis etc. to facilitate evidence-based integration. In fact many of the ethnomedicinal and ethnopharmacological studies have time and again demonstrated the role of TK in discovery of breakthrough drugs and natural products such as artemisinin, quinine, and aspirin which trace their origins to traditional remedies<sup>27-29</sup>. Similarly, another study on two Balkan ethnic groups living in close proximity reported that traditional knowledge about local plant resources help in withstanding periods of famine, and promoting biodiversity conservation<sup>30</sup>. Scientific validation thus not only enhances credibility of TKS but also helps in building confidence among policy makers, science communicators, and general public. The systematic and ethical TK documentation and validation supports the social, cultural, and economic advantages associated with indigenous knowledge holders by ensuring intellectual property rights protection and equitable access and benefit sharing mechanisms<sup>31</sup>. Failing to document and validate TK may run the risk of not only losing valuable cultural heritage but also related innovation and resilience opportunities.

#### **Need for traditional knowledge communication**

Traditional knowledge and practices are tied to a community's ethos, customs and values, and holds significant cultural, ecological and practical values. Such knowledge, often based on observations of nature, contributes extensively towards agriculture, health and environmental sustainability. Since TK/practices are usually passed down orally, are vulnerable to loss in the absence of appropriate documentation, validation and communication. It has been predicted that half of about 6,000 languages spoken presently across the world will become extinct by 2050 or 2100<sup>32</sup>. A language, whether oral or written, is not mainly an implication

of correspondence between individuals or community; but additionally it processes significant knowledge and wisdom of the local people or indigenous community, and therefore, the loss of language implies the loss of TK also. The risk is highest for the TK that is passed over to generations orally as only a part of knowledge is retained by the next generation leading to its gradual disappearance in every generation. Further, documented TK such as those in classical texts or manuscripts is often not accessible to general public, and even when accessible, is seldom understood, as they often exist in ancient or local languages such as Sanskrit, Pali, Urdu, Arabic, Persian, Tamil, etc.: This inaccessibility paves the way for exploitation of our traditional knowledge and resources particularly through misappropriated patents and through spreading misinformation<sup>33</sup>. In Indian context, language also acts as a major barrier in communication as English is the preferred language for such activities and only about 12% of our people can speak and write English<sup>34</sup>. Lack of effective communication and dissemination of evidence-based TK to society is a major deterrent in wider acceptability of our traditional wisdom. Sharing TK/practices which is verified through scientific enquiry and on the basis of modern scientific parameters is important not only for preserving cultural identity, sustainable development but also building trust and public understanding as it helps in gaining legitimacy. For example, several pharmacological studies have substantiated the immunomodulatory and antistressor properties of Ashwagandha (*Withania somnifera*), the Indian ginseng<sup>35,36</sup>. Evidence-based information on traditional knowledge based healthcare, helps promote their safe adoption and fosters informed decision-making among consumers<sup>37</sup>. This also helps in combating misinformation and false claims to a large extent<sup>38</sup>. Márquez and Porras (2020)<sup>39</sup> asserted that it is essential to expand access to scientific knowledge in languages other than English. Therefore to make communication inclusive, it is important to communicate validated traditional knowledge in local languages. Moreover, as the traditional knowledge is mostly limited to the elderly people and only to particular entities there is a gap of knowledge transfer to young generations<sup>40</sup>. Use of modern communication methods will help to disseminate verified TK content among the young generation. Bringing in expert views and mass dissemination

through social media and other digital/print communication tools in different regional languages will help in reaching and benefitting various sections of the society<sup>41</sup>. Exploring India's intellectual and scientific knowledge traditions thus need to be re-visited and disseminated using modern communication tools to not only bring alive the rich IKS of India but also using it wisely for future endeavors.

### Global Efforts on Traditional Knowledge

There are significant challenges associated with TK especially pertaining to its documentation, erosion, biopiracy and sharing of benefits arising out of TK projects. If these TK/practices are not appropriately managed at national and international levels, it may lead to loss, misappropriation and biopiracy of biological and genetic resources, and ultimately compromising existing TK. Therefore, to promote conservation and access to TK as well as to prevent their misuse, a number of international policies have been developed in last few decades in the form of conventions, treaties, agreements etc.<sup>32</sup> (Bhat and Taiwo 2016). The most prominent of these is the Convention on Biological Diversity (CBD) which was initially signed by 150 countries in 1992 in Rio de Janeiro, now boasts of 196 members (168 signatures) to date<sup>42</sup>. This treaty is playing a crucial role not only in protection and sustainable utilisation of biodiversity but also in TK access, and fair and equitable sharing of benefits arising out of the use of TK. The Nagoya Protocol (NP) adopted in 2010 under this Convention ensures access to genetic resources and the fair and equitable sharing of benefits arising from their utilisation. This convention, thus, unequivocally recognises the importance of TK and the rights of indigenous communities and TK holders. The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), adopted in 2001 by the members of the Food and Agriculture Organisation (FAO), is another powerful tool to tackle global challenges of climate change, food security and loss of biodiversity. ITPGRFA aligns with CBD, recognises the contribution of local farmers and communities in conservation and development of plant genetic resources, and ensures access and benefit sharing, farmers' rights, and sustainable use of genetic resources<sup>43</sup> (<https://www.fao.org/plant-treaty/en/>). World Intellectual Property Organisation (WIPO) Intergovernmental

Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (ICGTK) was established in 2000 to examine the intellectual property related issues by the member countries of WIPO that emerge with regard to protection of TK and traditional cultural expressions, and also regarding access and benefit sharing of such TK<sup>44</sup> (<https://www.wipo.int/en/web/igc/>). Similarly UN Declaration on Rights of Indigenous People adopted in 2007 provides a universal regulatory framework for the living, dignity, prosperity, and rights of the indigenous people worldwide<sup>45</sup>. Most of these international initiatives are directed towards protection and sustainable utilisation of TK, and still lots needs to be done towards raising awareness on TK and associated rights of the TK holders among general public.

### **Indian Initiatives on Traditional Knowledge**

In India also, several initiatives were taken to protect traditional knowledge, and the Biological Diversity Act (BDA) of 2002 has been the foremost amongst them. This Act targets preservation of biological diversity, benefit sharing arising out of its utilisation, prevention of biodiversity, and protection and conservation of related TK. The National Biodiversity Authority (NBA) is the nodal organisation to implement BDA with its headquarter in Chennai<sup>46</sup>. Similarly the Protection of Plant Variety and Farmers' Right Act of 2001 (PPV&FR Act) was enacted by the Government of India for protection of indigenous plant varieties and the rights of local farmers and plant breeders<sup>47</sup>. It also encourages the farmers to develop new varieties of plants. Other than the various regulatory frameworks on TK protection, there have been several efforts at national level also regarding documentation, validation, protection and promotion of India's traditional knowledge especially by higher education institutions across departments and ministries such as Ministry of Ayush, Ministry of Education [IKS (Indian Knowledge Systems Division), IITs (Indian Institute of Technology), etc.], Indian Council of Agricultural Research (ICAR), and Council of Scientific and Industrial Research (CSIR).

Efforts on India's Traditional Knowledge by the Council of Scientific and Industrial Research (CSIR)

CSIR being the oldest S&T council has played a pivotal role in preserving and propagating Indian traditional knowledge. Some of the major TK initiatives of CSIR are discussed in brief here.

### **1. Wealth of India Encyclopedia**

The Wealth of India - Raw Materials Series is a globally and highly praised encyclopedic series and a complete guide for researchers, entrepreneurs, herbal drug industrialists, and policy makers about India's natural raw material resources (plants, animals and minerals) including details of their occurrence, distribution, composition, utilisation and economic aspects<sup>48</sup>. The series known for its authenticity serves a vital part in protecting traditional and indigenous community knowledge of different Indian medicinal plants, animals and minerals.

George Watt (1851-1931), a University of Glasgow medical graduate, prepared an authoritative six-volume dictionary of economic products of the Indian sub-continent published during 1889-1893, followed by an index in 1896. Since, the actual wealth of any nation are its natural resources comprising primarily of plants, animals and minerals warranting systematic compilation for planning sustainable development strategies. The amendment and expansion of Watt's dictionary was again initiated as 'The Wealth of India' with the establishment of CSIR in 1942. During 1948-1976, the A to Z of raw materials were published in eleven volumes (along with two supplements), while the parallel series on 'industrial products' were covered in nine volumes. The first volume on raw materials was brought out in 1948 and carried out a foreword by the then science visionary and India's first Prime Minister, Shri Jawaharlal Nehru.

The series is particularly important in terms of its botanical entries which cover more than 6000 plant species including their nomenclature, distribution, cultivation, pests and diseases, products and by-products, traditional usage, yield, chemical composition, and import/export data. As an addition to this series, the Raw Materials Herbarium & Museum (RHMD) was also established in 1977, presently located at CSIR-NIScPR, New Delhi to showcase major plant species, animals and minerals covered under the encyclopedia.

### **2. Traditional Knowledge Digital Library (TKDL)**

**Traditional Knowledge Digital Library (TKDL)** Unit is a revolutionary initiative of CSIR, India in collaboration with Ministry of AYUSH, Government of India to protect Indian traditional knowledge particularly pertaining to traditional medicinal knowledge such as Ayurveda, Siddha, Unani, Yoga &

Naturopathy, Sowa Rigpa and Homeopathy, and preventing its misappropriation at international patent offices<sup>49</sup> (<https://www.csir.res.in/en/documents/tkdl>). The grant of a US patent to wound healing properties of turmeric (*Curcuma longa* L.), one of the ancient medicinal herbs, which has been traditionally used as a spice and therapeutic agent in India since ages, led to the conceptualization and establishment of this library by the CSIR as a proactive mechanism to protect India's TK. Since India is a culturally and language diverse country, further compound the vulnerability of traditional Indian medicinal knowledge as it exists in many languages and often in ancient dialects that no longer exist, making even documented knowledge difficult to be accessed or understood by the patent examiners worldwide.

Considering the above issues, TKDL was conceptualized to surmount the language and format barrier by systematically and structurally converting ancient Indian medical texts into five international languages namely, English, French, German, Spanish and Japanese using advancements in information technology and Traditional Knowledge Resource Classification (TKRC), a unique classification system for documenting TK. Until now, more than 4.5 lakh formulations and/or practices have been codified and documented into the TKDL database<sup>49</sup>. TKDL thus is an innovative and unique initiative that acts as a link between prior art (India's TK) and patent examiners.

### **3. Indian Journal of Traditional Knowledge (IJTK)**

The Indian Journal of Traditional Knowledge (IJTK) is an internationally acclaimed interdisciplinary peer reviewed monthly periodical that publishes original research articles, reviews, short communication etc. related to observations and experimental investigations on various aspects of traditional knowledge particularly biological activities of plants, animals and minerals used in traditional systems of medicine<sup>50</sup>. It also covers various topics concerned with indigenous claims of traditional knowledge such as ethnobotany, ethnomedicine, ethnopharmacology, ethnopharmacognosy and clinical studies on efficacy, as well as other related aspects of traditional knowledge. Started in 2002, it has traversed a long path and gained scholarly credibility which is evident from its indexation in globally indexed publication databases namely Web of Science, Science Citation index, Scopus, National Academy of Agricultural Sciences (NAAS) rating,

and WIPO's PCT Minimum Documentation. It has shown a consistent improvement in H-index, a reliable metric for measuring productivity and impact of a scholarly journal<sup>51</sup>. Dey et al. (2024)<sup>52</sup> gave a historic and scientometric account of IJTK from 2002-2022 highlighting its major milestones with a modest beginning as India's first journal on TK to becoming one of the India's top journals in its niche area.

### **Scientifically Validated Societal Traditional Knowledge (SVASTIK)**

There have been several reports on scientific validation of India's TK/practices for their relevance in today's context and their publication in research journals<sup>10,53-54</sup>. However, a significant volume of such knowledge even now awaits validation. Further, recording documented and validated data on traditional knowledge and bringing them together for larger visibility is of paramount importance. Creating awareness and sharing evidence-based knowledge among general public is also considered significant for instilling confidence in the knowledge that we have inherited. It has thus been realised that the lack of effectual communication with society on evidence-based TK/practices has been one of the major gaps in our current practices, and calls for an attention.

Considering immense significance of effective TK communication and dissemination, a national initiative to communicate India's scientifically validated TK to society with the brand name/tagline "#SVASTIK" - Scientifically Validated Societal Traditional Knowledge was implemented by CSIR-NIScPR upon the clarion call of the Hon'ble Prime Minister of India and President of the CSIR in August 2021<sup>55</sup> (Lata and Barman, 2021). The main aim of this initiative is to preserve and promote India's TK/practices, instill scientific temperament and boost public faith in our S&T heritage. SVASTIK aims to create a valuable repository of scientifically validated Indian traditional knowledge and its dissemination through social media, publications (both print and digital), and Indian and foreign language communication. The dissemination is being done in the following main areas of TK namely, Indian Mathematics and Physics, Indian Chemistry and Metallurgy, Indian Architecture, Indian Systems of Medicine, Traditional Agriculture & Food, Indian Commerce, Indian Way of Education and Philosophy, and Water, Ecology & Environment. Identification, evaluation, content creation, documentation and dissemination of

scientifically validated TK in the identified areas in the form of simplified and attractive infographics, short videos, and podcasts are done on all digital social media platforms including X (formerly Twitter), LinkedIn, Facebook, Instagram, and YouTube through SVASTIK social media handle (@NIScPR\_SVASTIK) (<https://niscpr.res.in/nationalmission/svastik>)<sup>56</sup>. So far, seventy eight infographic series on verified Indian TK/practices such as Aranmula metal mirror, URO-5, *Shulba Shutras*, Shatapawli, Yoga, *Rolu*, *Ashwagandha*, Ramappa temple, *Kunapajala*, Poita Bhat etc. have been disseminated. Dissemination is being done in English, 19 Indian languages and 05 selected foreign languages (French, German, Spanish, Russian and Japanese). In partnership with MyGov, an online citizen engagement platform, SVASTIK has garnered considerable appreciation and participation from the public. SVASTIK initiative thus have the potential to play a pivotal role towards strengthening and mainstreaming IKS, and for transforming India into a global S&T leader with its roots in traditional knowledge.

### Our Intellectual Heritage: The Way Forward

The opulence of our glorious intellectual heritage reflects upon its dynamic nature which evolves continuously. As we steward ahead in the 21<sup>st</sup> century with rapid technological changes, information tsunami, global socioeconomic and political challenges, and cultural shifts, there is an ever growing risk of losing connection with this intellectual inheritance. Hence, it is very important to reflect on it and outline a responsible way forward by blending the past and present—honouring timeless traditions as well as embracing innovation and critical thinking. We must encourage modern education rooted in IKS which promotes ethics, independence and critical thinking. Cross cultural dialogues must be promoted for fostering mutual respect, collective growth, and diverse perspectives. Timely public awareness and strict legislature must be ensured to save our S&T heritage for tackling modern day challenges of climate change, food security and biodiversity conservation. Thus, in conclusion, our intellectual heritage is a living guide for steering ahead bravely. We must carry this legacy forward by drawing on the past wisdom, nurturing a thoughtful present, and envisaging a righteous and enlightened future.

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### References

- 1 WIPO, Documenting Traditional Knowledge – A Toolkit, (2017), Geneva, Switzerland. (Documenting Traditional Knowledge – A Toolkit)
- 2 Mistry J & Berardi A, Bridging indigenous and scientific knowledge, *Science*, 352 (6291) (2016) 1274-1275.
- 3 Majumdar P (2024) Essays on the Indian Knowledge System.
- 4 Gupta A (2024) A study of the scientific approach inherited in the Indian knowledge system (IKS). *The Scientific Temper*, 15 (2), 2385-2389.
- 5 Indian Knowledge System - Unit I eBook (<https://hnbglearn.in/>)
- 6 Mamidala J K, Forging Connections: Integrating Indian Knowledge Systems in Higher Education, *IETE Technical Review*, 41 (3) (2024)271-273, DOI: 10.1080/02564602.2024.2342625
- 7 Kamala Shankar & Lucy P Liao, *Traditional Systems of Medicine*, Physical Medicine and Rehabilitation Clinics of North America, 15 (4) (2004) 725-47. doi: 10.1016/j.pmr.2004.03.006
- 8 Ambika, Aski M S, Gayacharan, Hamweih A, Talukdar A, et al., Unraveling Origin, History, Genetics, and Strategies for Accelerated Domestication and Diversification of Food Legumes, *Frontiers in Genetics*, 13 (2022) 932430. doi: 10.3389/fgene.2022.932430
- 9 Wang W, Nguen K T K, Zhao C & Hung H-C, Earliest curry in Southeast Asia and the global spice trade 2000 years ago, *Science Advances*, 9 (29) (2023) eadh5517. doi: 10.1126/sciadv.adh5517
- 10 Mahesh G, Communication and dissemination of India's traditional knowledge, *Indian Journal of Traditional Knowledge*, 22 (2) (2023) 450-457.
- 11 Dorji T, Rinchen K, Morrison-Saunders A, Blake D, Banham V & Peldan S, Understanding How Indigenous Knowledge Contributes to Climate Change Adaptation and Resilience: A Systematic Literature Review, *Environmental Management*, 74 (2024) 1101–1123. <https://doi.org/10.1007/s00267-024-02032-x>
- 12 Masanobu Fukuoka Natural Farm | The One-Straw Revolution.
- 13 Sinha P R, Kumar E K & Uniyal V P, Groundwater hydrochemistry of Naulas and Dharas (Springs) of Almora Kumaon Himalayas in Utrakhand their evaluation using graphical tools, *Ecology, Environment & Conservation*, 27 (2021) 80-83.
- 14 Agarwal A & Sinha S, Dying Wisdom: Rise, fall and potential of India's traditional water harvesting systems. *Centre for Science and Environment*, (1997) pp 404.
- 15 Khan M L, Khumbongmayum A D & Tripathi R S, The sacred groves and their significance in conserving biodiversity: an overview, *International Journal of Ecology Environmental and Sciences*, 34 (3) (2008) 277-291.

- 16 Berhe K T, Gesesew H A & Ward P R, Traditional healing practices, factors influencing to access the practices and its complementary effect on mental health in sub-Saharan Africa: a systematic review, *BMJ Open*, 14 (2024) e083004. doi:10.1136/bmjopen-2023-083004
- 17 James P B, Wardle J, Steel A, *et al.*, Traditional, complementary and alternative medicine use in Sub Saharan Africa: a systematic review, *BMJ Global Health*, 3 (2018) e000895. doi:10.1136/bmjgh-2018-000895
- 18 Jiri O, Mafongoya P & Chivenge P, Indigenous knowledge systems, seasonal “quality” and climate change adaptation in Zimbabwe, *Climate Research*, 66 (2) (2015) 103–111. <https://doi.org/10.3354/cr01334>
- 19 Amare Z Y, Indigenous knowledge of rural communities for combating climate change impacts in west central Ethiopia, *Journal of Agricultural Extension*, 22 (1) (2018) 81. <https://doi.org/10.4314/jae.v22i1.16>
- 20 Chaudhary B R, Acciaoli G, Erskine W & Chaudhary P, Responses of the Tharu to climate change-related hazards in the water sector: Indigenous perceptions, vulnerability and adaptations in the western Tarai of Nepal, *Climate and Development*, (2021) 1–14. <https://doi.org/10.1080/17565529.2021.1889947>
- 21 Zougmore R, Segnon AC, Thornton P, Harnessing indigenous knowledge and practices for effective adaptation in the Sahel, *Current Opinion Environment Sustainability*, 65 (2023) 101389. <https://doi.org/10.1016/j.cosust.2023.101389>
- 22 Nakashima D & Rou'e M, Indigenous Knowledge, Peoples, and Sustainable Practice, In: *Encyclopedia of Global Environmental Change* (Ed. Timmerman P), (2002), pp 314-324.
- 23 Pardo-de-Santayana M & Macía M, The benefits of traditional knowledge, *Nature*, 518 (2015) 487–488. <https://doi.org/10.1038/518487a>
- 24 Zhandire T, Gqaleni N, Ngcobo M & Gomo E, Attitudes and perceptions of traditional health practitioners towards documentation of patient health information in their practice in eThekweni Municipality, KwaZulu-Natal, Natal Province, South Africa. *Health Information Management*, 52 (1) (2023) 41–49. doi: 10.1177/1833358320984004.
- 25 Hamilton A, Medicinal plants, conservation and livelihoods, *Biodiversity Conservation*, 13 (2004) 1477–1517. doi: 10.1023/B:BIOC.0000021333.23413.42.
- 26 Zouraris D, Graikou K, Vasileiou P, Dimitrov V, Stevanovic Z D, *et al.*, EthnoHERBS: Harnessing traditional herbal knowledge for biodiversity conservation and innovative health solutions, *Computational and Structural Biotechnology Journal*, 29 (2025) 85-94. doi: 10.1016/j.csbj.2025.03.035.
- 27 Fabricant D S & Farnsworth N R (2001). The value of plants used in traditional medicine for drug discovery. *Environmental Health Perspectives*, 109 (Suppl 1), 69–75.
- 28 Willcox M L & Bodeker G (2004) Traditional herbal medicines for malaria. *BMJ*, 329, 1156-1159.
- 29 Newman D J & Cragg G M (2020). Natural products as sources of new drugs over the nearly four decades from 01/1981 to 09/2019. *Journal of Natural Products*, 83 (3), 770–803.
- 30 Pardo-de-Santayana M & Macia M J, The benefits of traditional knowledge, *Nature*, 518 (2015) 487-488.
- 31 Ten Kate K & Laird S A, The Commercial Use of Biodiversity: Access to Genetic Resources and Benefit-Sharing, (1999), *Routledge*, London, pp 418. <https://doi.org/10.4324/9780429341540>
- 32 Bhat J A & Taiwo S, Plant genetic resources and traditional knowledge in light of recent policy developments, In: *Plant Genetic Resources and Traditional Knowledge for Food Security* (Eds. R K Salgotra & B B Gupta), (2016) pp183-198. DOI 10.1007/978-981-10-0060-7\_10
- 33 Dhar B (2017) India's position in the Intergovernmental Committee for the protection of traditional knowledge. In: *Protecting traditional knowledge: The WIPO intergovernmental committee on intellectual property and genetic resources, traditional knowledge and folklore*, edited by Daniel F. Robinson, Ahmed Abdel-Latif, and Pedro Rofe, London, New York: Routledge, p. 108–121.
- 34 Barath H, Indian initiatives aim to break science's language barrier, *Nature*, 571 (2019) 289-290. <https://doi.org/10.1038/d41586-019-01815-1>
- 35 Archana R & Namasivayam A, Antistressor effect of *Withania somnifera*, *Journal of Ethnopharmacology*, 64 (1) (1998) 91-93.
- 36 Ziauddin M, Phansalkar N, Patki P, Diwanay S & Patwardhan B, Studies on the immunomodulatory effects of Ashwagandha, *Journal of Ethnopharmacology*, 50 (2) (1996) 69-76.
- 37 Tilburt J C, & Kaptchuk T J, Herbal medicine research and global health: an ethical analysis, *Bulletin of the World Health Organization*, 86 (2008) 594–599.
- 38 World Health Organization (WHO), *WHO Traditional Medicine Strategy 2014-2023*, (2013) Geneva: WHO.
- 39 Márquez M C & Ana M P, Science Communication in Multiple Languages Is Critical to Its Effectiveness, *Frontiers in Communication*, 5 (2020) 31. <https://www.frontiersin.org/article/10.3389/fcomm.2020.00031>.
- 40 Rajbanshi N & Thapa L B, Traditional knowledge and practices on utilizing medicinal plants by endangered Kisan ethnic group of eastern Nepal, *Ethnobotany Research and Applications*, 18 (2019) 1-9.
- 41 Aamodt C M *et al.*, Social Media: Good or Evil? *Science*, 375 (6581) (2022) 608-609. <https://www.cbd.int/information/parties.shtml>
- 42 <https://www.fao.org/plant-treaty/en/>
- 43 <https://www.wipo.int/en/web/igc/>
- 44 UN Declaration on the Rights of Indigenous Peoples | OHCHR
- 45 <http://www.nbaindia.org/>
- 46 Official website of Protection of Plant Varieties and Farmers' Rights Authority, Ministry of Agriculture and Farmers Welfare
- 47 <https://niscpr.res.in/knowledgeproducts/wealthofindia#About-Wealth-of-India>
- 48 <https://www.csir.res.in/en/documents/tkdl>
- 49 <https://or.niscpr.res.in/index.php/IJTK>
- 50 Helder S, "Google Scholar Metrics for Publications". *googlescholar.blogspot.com.br*. (2012).
- 51 Dey P, Lata C & Barman P, Scientometric Representation of Indian Journal of Traditional Knowledge, 2002–2022, *Publishing Research Quarterly*, 40 (2024) 48–69. <https://doi.org/10.1007/s12109-024-09977-1>

- 53 Sarkar S, Kundu S S & Ghorai D (2014) Validation of ancient liquid organics – Panchgavya and Kunapajala as plant growth promoters. *Indian Journal of Traditional Knowledge*, 13 (2) 398-403.
- 54 Rawat A & Sah R (2007). Traditional Knowledge of Water Management in Kumaon Himalaya. *Indian Journal of Traditional Knowledge*, 8 (2) 249-254.
- 55 Lata C & Barman P (2021). Launch of the national initiative SVASTIK to communicate India's scientifically validated traditional knowledge to the society. *Indian Journal of Traditional Knowledge*, 21 (04) 1102-1103.
- 56 <https://niscpr.res.in/nationalmission/svastik>