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INDIA AS A PIONEER IN TRADITIONAL KNOWLEDGE PROTECTION: CONSTITUTIONAL FOUNDATIONS, BIODIVERSITY LAW, PATENT REFORMS, AND THE TKDL MODEL

-Siddharthsinh Sisodia[1]

ABSTRACT

This article examines the Indian legal framework for the protection of traditional knowledge (TK), arguing that India has developed some of the world's most sophisticated yet structurally constrained domestic mechanisms in this field. Drawing on Chapter 3 of a broader comparative dissertation on TK and intellectual property law, the article analyses India's multi-layered regulatory architecture, encompassing constitutional foundations, the Biological Diversity Act 2002 (BDA), the Patents Act 1970 (as amended), the Traditional Knowledge Digital Library (TKDL), the Protection of Plant Varieties and Farmers' Rights Act 2001 (PPVFR Act), and the Geographical Indications of Goods (Registration and Protection) Act 1999.

The central argument advanced is that while India has built a genuinely innovative and globally influential system of defensive TK protection, its legal framework remains structurally biased toward preventing misappropriation by external actors rather than conferring enforceable positive rights upon TK-holding communities themselves. The TKDL, although widely regarded as an international gold standard of defensive documentation, operates as a state-managed database that places knowledge in the public domain without creating community ownership or benefit-sharing entitlements. The BDA's Access and Benefit-Sharing (ABS) mechanisms vest discretionary authority in the National Biodiversity Authority (NBA), leaving communities as beneficiaries of state-mediated processes rather than autonomous rights-holders. Similarly, the PPVFR Act and GI Act offer formal protections that are in practice inaccessible or unenforceable for many of the communities they are intended to serve.

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The article concludes by identifying a structural gap between India's defensive achievements and the rights-based frameworks emerging in jurisdictions such as Peru, Brazil, and the African Union, and calls for India to move toward a sui generis TK protection system that recognises community intellectual property rights as a statutory entitlement rather than an administrative grace.

Keywords: *Traditional Knowledge · Biopiracy · Intellectual Property · Biological Diversity Act 2002 · TKDL · Patents Act 1970 · PPVFR Act · Geographical Indications · Access and Benefit-Sharing · Sui Generis Protection · Prior Informed Consent · India*

1. INTRODUCTION: INDIA'S UNIQUE POSITION IN THE TK DISCOURSE

India has a special niche in the international discourse of protection of traditional knowledge (TK). It is also one of the richest countries in the world, inhabited by an exceptional wealth of diverse and tribal peoples with centuries of cumulative expertise regarding biological resources, medicines, agriculture, and ecological systems; among the most seriously impacted by biopiracy in the late twentieth century; and one of the few developing nations to have actively developed a multi-layered domestic legal infrastructure with a specific focus on TK protection. Constitutional amendments to specialised biodiversity legislation, amendments to patent laws, to a world-renowned digital library, India has already made a big and diverse and in many ways pioneering response to the TK challenge.

The Indian system has not gone without its share of criticism though. A major structural constraint which scholars repeatedly note in the literature is that the legal frameworks in India are largely geared toward defensive protection against the misappropriation of TK by third parties as opposed to providing positive and enforceable rights to the indigenous and local communities who own and ensure the maintenance of TK. This article reviews the main elements of the domestic TK protection system in India individually, looks at their legal frameworks, evaluates their concrete successes, and critically reviews their shortcomings. It also ends by determining the structural gap that comparative analysis must aim to fill.

2. CONSTITUTIONAL AND POLICY PERSPECTIVES: STATE RESPONSIBILITY TOWARD CULTURAL HERITAGE AND BIODIVERSITY

India occupies a unique position in the global debate on traditional knowledge (TK) protection. It is, simultaneously, one of the world's most biodiverse nations, home to an extraordinary plurality of indigenous and tribal communities with centuries of accumulated knowledge about biological resources, medicines, agriculture, and ecological systems; one of the country's most severely affected by biopiracy in the late twentieth century; and one of the few developing countries to have proactively constructed a multi-layered domestic legal architecture specifically designed to address TK protection. From constitutional provisions to specialised biodiversity legislation, from patent law amendments to a globally recognised digital library, India's response to the TK challenge has been substantial, innovative, and in several respects pioneering.

Yet the Indian framework has also attracted persistent and well-founded criticism. Scholars across the literature consistently identify a central structural limitation: India's legal mechanisms are predominantly oriented toward defensive protection preventing the misappropriation of TK by third parties rather than toward conferring positive, enforceable rights on the indigenous and local communities that hold and maintain TK. This chapter examines each of the principal components of India's domestic TK protection framework in turn, analysing their legal architecture, assessing their practical achievements, and critically evaluating their limitations against the normative standards developed in the previous chapters. The chapter concludes by identifying the structural gap that the comparative analysis in Chapter 4 will seek to address.

2.1 ENVIRONMENTAL AND CULTURAL PROVISIONS OF THE CONSTITUTION

India's Constitution does not contain an explicit right to traditional knowledge or an express guarantee of indigenous intellectual property. Nevertheless, a number of constitutional provisions create the normative foundation upon which India's TK protection framework rests, and scholars have argued that these provisions impose on the Indian state a duty to protect both the biological diversity that sustains TK and the cultural communities that produce and maintain it.

The most directly relevant provisions are Articles 48A and 51A(g), inserted by the 42nd Constitutional Amendment in 1976. Article 48A imposes a directive principle of state policy requiring the state to endeavour to protect and improve the environment and to safeguard the forests and wildlife of the

country. Article 51A(g) makes it a fundamental duty of every citizen to protect and improve the natural environment, including forests, lakes, rivers, and wildlife, and to have compassion for living creatures.[2] Taken together, these provisions embed biodiversity conservation within the constitutional order and since TK is, as Gupta has argued, inextricably linked to the ecosystems within which it developed and to which it relates, the constitutional mandate to protect biological diversity is at least implicitly a mandate to protect the knowledge systems associated with it.

The Supreme Court of India has, through its expansive interpretation of Article 21 (the right to life), further extended constitutional protection to environmental and ecological interests. In decisions such as Maneka Gandhi v Union of India and MC Mehta v Union of India, the Court has read Article 21 as encompassing not merely the right to physical survival but the right to a dignified life within a healthy environment.[3] While these decisions have not directly addressed TK, they establish a constitutional tradition of broad, rights-expansive interpretation that could, in principle, be applied to recognise TK holders' interest in the continued integrity of their knowledge systems as a component of their right to dignified life and cultural identity.

Forests and biodiversity are included in the Concurrent List of the Seventh Schedule, meaning that both Parliament and state legislatures may legislate on these subjects, within the limits set by parliamentary law.[4] This constitutional structure has important implications for TK governance: it means that national frameworks like the Biological Diversity Act 2002 set the overarching framework, but that states can, and do, develop complementary mechanisms. The result is a degree of institutional plurality that can be both a strength allowing context-specific adaptation and a weakness, since inconsistency across states can create gaps and uncertainties in the overall framework.

The Directive Principles of State Policy are also relevant. Article 39(b) directs the state to ensure that the ownership and control of material resources of the community are distributed in a way that subserves the common good, and Article 46 requires the state to promote the educational and economic interests of scheduled castes, scheduled tribes, and other weaker sections.[5] These provisions, though not enforceable as fundamental rights, carry significant interpretive weight and support the argument that the state has a constitutional obligation to design TK protection frameworks that serve

[2]Constitution of India 1950, arts 48A, 51A(g).

[3]ibid art 21; Maneka Gandhi v Union of India AIR 1978 SC 597; MC Mehta v Union of India (1987) 1 SCC 395.

[4]Constitution of India 1950, Entry 17A, List III (Concurrent List), Seventh Schedule (as amended by the 42nd Constitutional Amendment Act 1976).

[5]ibid arts 39(b), 46.

the interests of tribal and indigenous communities rather than merely preventing commercial misappropriation by outsiders.

2.2 NATIONAL BIODIVERSITY STRATEGY AND POLICY FRAMEWORK

At the policy level, India's National Biodiversity Action Plan and associated biodiversity strategies situate TK protection within a broader framework of biodiversity conservation and sustainable development.[6] These policy documents acknowledge that the conservation of biological diversity is inseparable from the preservation of the traditional knowledge and practices of the communities that have developed and maintained it over generations. They recognise the contribution of local communities to biodiversity conservation and commit the state to ensuring that these communities benefit from the commercial use of their knowledge and resources.

Gupta's analysis of the interface between IP rights and biodiversity governance in India places particular emphasis on the need for policy frameworks that go beyond the negative obligation not to misappropriate TK and actively support community-level innovation and benefit-sharing.[7] He argues that the National Innovation Foundation (NIF) and related grassroots innovation initiatives represent valuable, if underscaled, institutional experiments in translating policy commitments into practical support for TK-holding communities. The challenge, as subsequent sections of this chapter demonstrate, is that the legislative frameworks have not always kept pace with these policy ambitions, and the gap between normative aspiration and practical implementation remains significant.

3. THE BIOLOGICAL DIVERSITY ACT, 2002: ABS MECHANISMS AND THE ROLE OF THE NBA

3.1 OVERVIEW AND LEGISLATIVE DESIGN

The Biological Diversity Act 2002 (BDA) is the cornerstone of India's domestic legal response to the challenges of biodiversity conservation and TK protection. Enacted to give domestic effect to India's obligations under the Convention on Biological Diversity particularly the CBD's requirements of

[6]National Biodiversity Action Plan 2008 (Ministry of Environment and Forests, Government of India) <https://www.moef.gov.in/> accessed 22 March 2025.

[7]Anil K Gupta, 'The Role of Intellectual Property Rights in the Sharing of Benefits Arising from the Use of Biological Resources and Traditional Knowledge' (Study prepared for the Ministry of Environment and Forests, Government of India; referenced by WIPO and UNEP) 5.

national sovereignty over biological resources, access and benefit-sharing, and respect for traditional knowledge the BDA establishes a three-tiered institutional architecture comprising the National Biodiversity Authority (NBA), State Biodiversity Boards (SBBs) and Biodiversity Management Committee.[8]

The Act creates a regulatory framework governing access to India's biological resources and associated traditional knowledge. Section 3 prohibits any person who is not a citizen of India, or any corporate body not incorporated in India, from obtaining any biological resource or associated knowledge for research or commercial utilisation without prior approval of the NBA.[9] Section 6 further provides that no person shall apply for any intellectual property right in or outside India for any invention based on any research or information on a biological resource obtained from India without obtaining prior approval from the NBA.[10] These provisions constitute the Act's principal anti-biopiracy mechanism: they subject commercial access to Indian biodiversity and TK to a prior authorisation requirement, creating a legal gateway through which the NBA can impose benefit-sharing conditions on any research or commercialisation that draws on India's biological wealth.

Section 7 imposes a lighter obligation on Indian nationals: Indian citizens and bodies corporate registered in India are required to give prior intimation to the relevant State Biodiversity Board before obtaining biological resources for commercial utilisation or bio-survey purposes.[11] This lighter regime reflects the Act's primary focus on regulating external access rather than restricting domestic use, though critics have noted that it creates a significant asymmetry: large Indian pharmaceutical and agricultural corporations can access traditional biological resources with only a notice requirement, while the communities that developed and maintained knowledge of those resources have no equivalent mechanism for asserting rights or claiming benefits from domestic commercial exploitation.

3.2 THE NATIONAL BIODIVERSITY AUTHORITY: POWERS AND FUNCTIONS

The NBA is established under Section 8 of the BDA as a statutory body with considerable powers over the regulation of biodiversity access. Its primary functions include the granting and rejection of applications for access to biological resources, the imposition of benefit-sharing conditions, the

[8]Biological Diversity Act 2002 (India) (BDA 2002), Preamble.

[9]ibid s 3.

[10]ibid s 6.

[11]ibid s 7.

settlement of disputes relating to biological resources, and the maintenance of the National Biodiversity Fund. The NBA is also mandated to advise the central government on matters relating to biodiversity conservation and to liaise with international organisations and other countries on biodiversity-related matters.[12]

The benefit-sharing mechanism under Section 21 of the Act is particularly significant for TK holders. When approving access to biological resources and/or associated TK, the NBA is empowered to impose terms and conditions including the sharing of benefits arising from commercial and other use whether financial, non-financial, or in the form of technology transfer with the local bodies or individuals concerned. The Act does not specify a minimum percentage of benefits to be shared, leaving this entirely to the NBA's discretion.[13] The Biological Diversity (Access to Biological Resources and Knowledge Associated therewith and Fair and Equitable Sharing of Benefits) Regulations 2014 provide some procedural framework for benefit-sharing negotiations, but the substantive terms remain to be negotiated case by case.[14]

In practice, the NBA's record on benefit-sharing has attracted significant criticism. Dutfield's analysis of national ABS mechanisms notes that the absence of mandatory minimum benefit shares, combined with weak institutional capacity and limited community participation in negotiation processes, has meant that benefit-sharing under the BDA has remained largely notional in many cases.[15] Ragavan's structural critique applies directly here: the NBA's benefit-sharing regime, whatever its formal powers, operates within a political economy in which large commercial users have substantially greater bargaining power than the TK-holding communities whose knowledge they are exploiting.[16] Unless benefit-sharing obligations are specified in concrete, enforceable terms and community representatives are genuinely empowered to negotiate and enforce them, the NBA's discretionary approach is likely to produce outcomes that systematically undervalue TK.

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[12]ibid s 18.

[13]ibid s 21.

[14]Biological Diversity Rules 2004 (India), r 14; Biological Diversity (Access to Biological Resources and Knowledge Associated therewith and Fair and Equitable Sharing of Benefits) Regulations 2014.

[15]Graham Dutfield, Protecting Traditional Knowledge: Pathways to the Future (ICTSD 2006) <https://www.ictsd.org/downloads/2008/06/cs_dutfield.pdf> accessed 22 March 2025, 26.

[16]Srividhya Ragavan, 'Protection of Traditional Knowledge' (2001) 2 Minnesota Intellectual Property Review 1, 22 <https://scholarship.law.umn.edu/cgi/viewcontent.cgi?article=1008&context=minn_ip_rev> accessed 22 March 2025.

3.3 BIODIVERSITY MANAGEMENT COMMITTEES AND THE PEOPLE'S BIODIVERSITY REGISTER

One of the most innovative features of the BDA's institutional architecture is the provision for Biodiversity Management Committees at the local level. Section 41 of the Act requires every local body panchayats in rural areas, municipal councils in urban areas to constitute a BMC for the purpose of promoting conservation, sustainable use, and documentation of biological diversity.[17] BMCs are empowered to prepare and maintain a People's Biodiversity Register (PBR), which is intended to document the local biological resources and related traditional knowledge of the area within their jurisdiction.

The PBR is conceptually important as an instrument of community-level documentation. Unlike the TKDL (discussed in Section 3.4), which is a centralised, state-curated database primarily designed for defensive purposes in the international patent system, the PBR is designed to be a community-owned record of local biodiversity and associated knowledge.[18] The NBA has supported PBR preparation through guidelines and funding, and thousands of PBRs have been prepared across India's states. This extensive documentation effort represents a significant achievement in terms of the volume of TK recorded.

However, the PBR initiative has also attracted criticism on two related grounds. First, the documentation of TK in a PBR does not confer any positive legal rights on the communities concerned: it merely creates a record of existing knowledge, without vesting ownership, control, or benefit-sharing entitlements. Second, and more troublingly, documentation in a public register without accompanying legal protection may actually increase a community's vulnerability to exploitation, since the knowledge is now accessible in written form without any legal mechanism preventing its commercial use by outsiders. This is precisely the concern that Correa identified in relation to purely defensive documentation strategies: public disclosure without supporting rights may expose communities to further exploitation rather than protecting them from it.[19]

Phillips's more optimistic reading acknowledges the PBR's potential as a community empowerment tool, arguing that documentation can increase communities' bargaining power by establishing a clear

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[17]ibid s 41.

[18]National Biodiversity Authority, 'People's Biodiversity Register' <https://www.nbaindia.org/pbr.html> accessed 22 March 2025.

[19]Carlos M Correa, Traditional Knowledge and Intellectual Property: Issues and Options Surrounding the Protection of Traditional Knowledge (WIPO 2001) <https://www.wipo.int/edocs/pubdocs/en/tk/764/wipo_pub_764.pdf> accessed 22 March 2025, 20.

record of their knowledge and by providing evidence that can be used in benefit-sharing negotiations.[20] This argument has merit, but it presupposes that communities have the legal literacy, institutional capacity, and access to legal support necessary to translate documented knowledge into negotiating leverage. In many parts of India, these preconditions are absent.

3.4 ENFORCEMENT AND PENALTIES

The BDA provides for criminal penalties for violation of its access and benefit-sharing requirements, including imprisonment of up to five years and substantial fines.[21] However, enforcement has been weak in practice. The Act relies primarily on the NBA and SBBs to initiate complaints, and these bodies have limited investigative capacity and resources. There have been relatively few prosecutions under the Act, and those that have occurred have not resulted in significant deterrent outcomes. The broader enforcement challenge identified by Drahos is relevant here: developing countries like India are structurally disadvantaged in enforcing ABS obligations against multinational corporations operating across jurisdictions, since the most serious acts of biopiracy often occur entirely outside India's territorial jurisdiction in the patent offices and research laboratories of developed countries.[22]

4. THE PATENTS ACT, 1970: SECTION 3(P) AND MANDATORY DISCLOSURE REQUIREMENTS

4.1 THE PATENTS ACT AND THE CHALLENGE OF TK-BASED PATENTS

The Patents Act 1970, as amended significantly by the Patents (Amendment) Acts of 1999, 2002, and 2005 the last of which brought India's patent law into full compliance with its TRIPS obligations contains several provisions specifically designed to prevent the misappropriation of traditional knowledge through the patent system. These provisions represent India's primary domestic legal tool for addressing the phenomenon of biopiracy directly within the IP framework, as distinct from the access-regulation approach of the BDA.

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[20]Freedom-Kai Phillips, 'Intellectual Property Rights in Traditional Knowledge: Enabler of Sustainable Development' (2016) 25 RECIEL 276, 284 <https://doi.org/10.1111/reel.12170> accessed 22 March 2025.

[21]BDA 2002 (n 9) ss 55–57 (penalty provisions).

[22]Peter Drahos, 'Indigenous Knowledge and the Law' (2002) in Graham Dutfield (ed), Literature Survey on Intellectual Property Rights and Sustainable Development (ICTSD 2002) 8.

Before examining the specific provisions, it is worth situating them within the broader context of the patent system's relationship with TK a relationship that Ragavan, Correa, and Drahos have all characterised as fundamentally antagonistic. The international patent system, as examined in Chapter 2, grants protection to novel, inventive, individually-authored knowledge for a limited period. TK is, by definition, old, collectively generated, and not attributable to any individual inventor.[23] The patent system's novelty requirements should, in theory, prevent the granting of patents over TK. The problem, as discussed in Chapter 2, is that TK has historically been invisible to patent examiners because it exists in forms oral traditions, vernacular texts, community practices that are not captured by conventional prior art searches. India's patent law amendments sought to address this invisibility both by expressly excluding certain TK-based claims from patentability and by creating mechanisms to bring TK to the attention of patent authorities.

4.2 SECTION 3(P): EXCLUSION OF TK FROM PATENTABILITY

The most significant provision of the Patents Act for TK protection is Section 3(p), which was inserted by the Patents (Amendment) Act 2002. Section 3(p) provides that an invention which, in effect, is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components, shall not be patentable.[24] This is a categorical exclusion: it does not require a case-by-case novelty assessment against specific prior art; instead, it prevents any TK-based claim from qualifying as a patentable invention, regardless of whether prior art can be specifically identified.

Section 3(p) is a more direct and comprehensive instrument than the novelty-based defences available under general patent law. Under a standard novelty analysis, a patent can be invalidated only if specific prior art disclosing the claimed invention can be identified. Section 3(p) avoids this requirement by treating TK as a category categorically excluded from the patent system. This is an important doctrinal innovation: it reflects the legislative judgment that TK, by its nature, should not be subject to private appropriation through the patent system, regardless of whether it can be specifically traced to a documented source.[25]

[23]Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) (adopted 15 April 1994, entered into force 1 January 1995) 1869 UNTS 299, art 27.

[24]Patents Act 1970 (India) (as amended by the Patents (Amendment) Act 2005) s 3(p).

[25]Patents Act 1970 (n 28) s 3(p).

The provision has been praised by scholars, including in the literature survey, as a meaningful step in aligning Indian patent law with the requirements of TK protection. Correa's framework, which calls for domestic legal reforms that close the gap created by TRIPS's silence on TK, is specifically met by Section 3(p) in the Indian context.[26] However, the provision also has limitations. Its application depends on patent examiners being able to identify that a claimed invention is TK-based a determination that requires access to knowledge about what constitutes traditional knowledge and what specific traditional practices exist. Without adequate TK databases and trained examiners, the exclusion cannot be effectively applied. This is the context in which the TKDL, discussed in the next section, becomes indispensable.

4.3 PRE-GRANT AND POST-GRANT OPPOSITION ON TK GROUNDS

Complementing Section 3(p), the Patents Act provides for both pre-grant and post-grant opposition mechanisms that can be invoked on TK grounds. Under Section 25(1)(k), any person may oppose a patent application before grant on the ground that the invention is anticipated by TK available within any local or indigenous community in India or elsewhere. Section 25(2)(k) provides the same ground for post-grant opposition.[27] These provisions operationalise the defensive protection approach: they give any person not just the original TK holder standing to challenge a patent application or grant on the basis that the claimed invention is not novel because it is based on traditional knowledge.

The turmeric and neem cases, discussed in Chapter 2, illustrate both the potential and the limitations of this opposition mechanism in the international context. In the Indian domestic context, the pre- and post-grant opposition provisions have been used to prevent the grant of patents over indigenous knowledge, though the publicly available record of specific domestic oppositions is limited. The broader point identified in the research article on prior art and patent disclosure is that opposition-based defensive strategies are reactive by nature: they require that a patent application be identified and challenged after the fact, rather than preventing TK-based applications from being filed in the first place.[28][29]

[26]Correa (n 23) 16.

[27]ibid s 25(1)(k) and s 25(2)(k).

[28]Council of Scientific and Industrial Research v United States Patent and Trademark Office (Turmeric Patent Case) (US Patent No 5,401,504, revoked 1997).

[29]Neem Patent Revocation (European Patent Office, Case No T 416/01, 2000).

4.4 DISCLOSURE REQUIREMENTS UNDER SECTION 10

Section 10(4)(d)(ii) of the Patents Act, as amended in 2005, requires patent applicants to disclose the source and geographical origin of any biological material used in an invention, where such material is used in the specification. This disclosure requirement which applies to Indian patent applications is designed to ensure that patent examiners and third parties can assess whether an application involves biological resources or associated TK, triggering the NBA's prior approval requirement under Section 6 of the BDA.[30]

The disclosure requirement is a significant step in creating a legal link between the patent system and the biodiversity access regime. However, as Gervais has noted in relation to similar proposals at the international level, its effectiveness depends critically on two conditions: first, that applicants actually comply with the disclosure obligation; and second, that patent authorities have access to the knowledge and databases necessary to assess the disclosures made.[31] India's patent office has not consistently enforced the disclosure requirement, and there is limited evidence of systematic cross-referencing between patent applications and biodiversity access records. The lack of mandatory sanctions for non-disclosure beyond the potential invalidation of the patent reduces the deterrent effect of the obligation. This is one area where India's domestic framework falls short of the more robust disclosure models advocated by developing countries in the TRIPS Council.

5. THE TRADITIONAL KNOWLEDGE DIGITAL LIBRARY: A GLOBAL GOLD STANDARD FOR DEFENSIVE PROTECTION

5.1 ORIGINS AND INSTITUTIONAL ARCHITECTURE

The Traditional Knowledge Digital Library (TKDL) is, without question, India's most internationally celebrated contribution to the global effort to protect traditional knowledge. Developed jointly by the Council of Scientific and Industrial Research (CSIR) and the Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) under the Ministry of Health and Family Welfare, the TKDL was established in 2001 and has since grown into a database of over 34 million pages of formatted information documenting traditional knowledge from Ayurveda, Unani, Siddha, and Yoga, drawn from ancient Sanskrit, Persian, Arabic, and other classical texts.[32]

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[30]ibid s 10(4)(d)(ii).

[31]Daniel J Gervais, The TRIPS Agreement: Drafting History and Analysis (4th edn, Sweet & Maxwell 2012) 320.

[32]Traditional Knowledge Digital Library (TKDL) <https://www.tkdl.res.in> accessed 22 March 2025.

The TKDL's core innovation lies in its methodology of knowledge transcription. Traditional knowledge from classical texts which existed in a form inaccessible to modern patent examiners, being written in classical languages and not indexed in any patent classification system is converted into a standardised, electronically searchable format using the Traditional Knowledge Resource Classification (TKRC), a specially developed classification system that maps TK onto the International Patent Classification (IPC) used by global patent offices.[33] This transcription process allows patent examiners at major patent offices worldwide to search TK prior art in a format they are equipped to use, thereby enabling them to reject patent applications that lack novelty in light of documented traditional practices.

The TKDL has established access agreements with the European Patent Office, the United States Patent and Trademark Office, the UK Intellectual Property Office, the Japanese Patent Office, and several other patent offices, allowing their examiners to search the TKDL database when examining patent applications in relevant fields. It is also accessible to Indian patent examiners as a standard search resource.[34] The TKDL Trust the body that administers the TKDL negotiates these access agreements and maintains oversight over the use of TKDL materials, including restrictions on disclosure to third parties and limitations on the use of TKDL records for purposes other than patent examination.

5.2 ACHIEVEMENTS AND IMPACT

The TKDL's defensive achievements have been substantial and well-documented. The TKDL has been credited with the withdrawal or rejection of over 250 patent applications at the European Patent Office alone, including applications over well-known Ayurvedic formulations and yoga postures. The database has also been used to challenge patent applications at the USPTO and other offices.[35] These outcomes represent a significant practical contribution to the prevention of biopiracy, and they have influenced the design of similar initiatives in other countries, including China's traditional Chinese medicine database.

The TKDL is widely regarded as a model for defensive TK protection at the international level. WIPO has acknowledged it as a pioneering initiative, and the IGC has referenced the TKDL model in its

[33]TKDL, 'About TKDL' <https://www.tkdl.res.in/tkdl/langdefault/common/Abouttkdl.asp?GL=Eng> accessed 22 March 2025.

[34]ibid.

[35]Council of Scientific and Industrial Research, 'TKDL — A Safeguard for Indian Traditional Knowledge' (CSIR 2011) <https://www.csir.res.in> accessed 22 March 2025.

discussions of defensive protection mechanisms. Wilkof and Basheer's analysis notes that the TKDL represents an effective interface tool between TK and the formal patent system, operating within the existing patent framework to prevent specific acts of misappropriation without requiring any reform of patent law itself.[36]

Gupta's institutional analysis emphasises the TKDL's contribution to what he terms "proactive defensive protection" using documentation not merely to create a passive archive but to actively intervene in patent examination processes to prevent wrongful grants.[37] He identifies this as a significant advance over earlier defensive approaches that relied on reactive opposition proceedings initiated after patents had already been granted.

5.3 LIMITATIONS AND CRITICAL ASSESSMENT

Despite its considerable achievements, the TKDL has attracted substantial scholarly criticism on grounds that go to the heart of the defensive-versus-positive protection debate. Three critiques are particularly salient.

First, and most fundamentally, the TKDL does not vest any rights in the communities whose knowledge it documents. It converts traditional knowledge into patent-searchable prior art, but the practical effect is to place that knowledge firmly in the public domain: it cannot be patented by external actors, but equally it cannot be owned, controlled, or commercialised by the communities that developed it. Dutfield's analysis captures this paradox precisely: the TKDL prevents privatisation by external parties without enabling possession by internal communities.[38] From a rights-based perspective, this is a form of protection for the public domain rather than protection for TK holders.

Second, the research article in the literature survey makes a pointed critique that deserves extended engagement: by encoding living, dynamic, community-held knowledge in the static formats of the patent classification system, the TKDL risks recharacterizing what is fundamentally a living cultural practice as a fixed, state-owned informational resource. This is not merely a theoretical concern. The TKDL is administered by a government body; the communities whose knowledge it documents have no formal role in its governance, no control over the terms on which access agreements are made with foreign patent offices, and no mechanism for asserting that specific knowledge should not be included

[36]Neil Wilkof and Shamnad Basheer (eds), Overlapping Intellectual Property Rights (Oxford University Press, Indian edn, 2013) 25.

[37]Gupta (n 6) 13.

[38]Dutfield (n 17) 32.

or disclosed. The conversion of community knowledge into a state-administered database without community consent or participation reproduces, in a subtle but important way, the same logic of extraction that the TKDL is designed to prevent.[39]

Third, the TKDL's geographic and thematic coverage is limited in ways that have significant implications for equitable protection. The database draws primarily from classical written texts in the Ayurvedic, Unani, and Siddha traditions traditions that are well-documented and that relate primarily to the knowledge systems of certain regions and communities. The vast body of oral, undocumented TK held by tribal and indigenous communities particularly in the northeast, the Andaman and Nicobar Islands, and remote forest regions is not captured by the TKDL and therefore receives none of its defensive protection. Sunder's concern that TK discourse tends to value documented, codified knowledge over living, oral traditions is directly relevant here: the communities most vulnerable to exploitation may be precisely those whose knowledge the TKDL does not reach.[40]

The overall assessment of the TKDL is that it is a genuinely innovative and practically effective defensive tool that has made a real contribution to preventing biopiracy in specific domains. It represents India's most sophisticated engagement with the defensive protection model recommended by WIPO. But its very success in the defensive protection paradigm makes it a useful illustration of that paradigm's limitations: it protects TK from external appropriation without addressing the question of how TK-holding communities can derive positive benefit from their knowledge.[41]

6. SPECIALISED LEGISLATION: THE PPVFR ACT 2001 AND GEOGRAPHICAL INDICATIONS AS ALTERNATIVE PROTECTION ROUTES

6.1 THE PROTECTION OF PLANT VARIETIES AND FARMERS' RIGHTS ACT, 2001

The Protection of Plant Varieties and Farmers' Rights Act 2001 (PPVFR Act) occupy a distinctive place in India's TK protection framework. Enacted to give effect to India's obligations under TRIPS Article 27(3)(b) which permits members to protect plant varieties through an "effective sui generis system" rather than patents the PPVFR Act provides a legal framework for the registration and

[39]Ragavan (n 18) 26.
[40]Sunder (n 27) 114.
[41]WIPO (n 37) 12.

protection of plant varieties while also incorporating explicit protections for farmers' rights and for the traditional agricultural knowledge associated with plant varieties developed over generations.

The Act's definition of "farmer" is deliberately broad, encompassing not only commercial cultivators but also any person who conserves or preserves, knowingly or unknowingly, varieties through traditional practices.[42] This broad definition reflects the Act's recognition that the maintenance of crop diversity in India has depended historically on the practices of millions of small farmers and tribal communities whose selective cultivation, seed-saving, and exchange practices constitute a form of collective, intergenerational plant breeding.

Section 39 of the Act specifically protects farmers' rights. It provides that farmers shall be entitled to save, use, sow, resow, exchange, share, or sell their farm produce including seed of a protected variety, as long as they do not sell branded seed of a protected variety.[43] This farmers' privilege is wider than the equivalent provision under the UPOV Convention (the International Union for the Protection of New Varieties of Plants), which has consistently sought to limit farmers' rights to save and exchange seed in the interests of commercial breeders.[44] India's deliberate departure from the UPOV model in this respect reflects the government's recognition that India's agricultural biodiversity which is among the richest in the world depends on the continuation of traditional seed-saving practices, and that IP protection for plant varieties must be designed in a way that is compatible with rather than destructive of these practices.

Section 16(1)(d) of the PPVFR Act also allows farmers or farmer communities to apply for registration of plant varieties, including farmers' varieties a provision that in principle permits communities to obtain formal legal protection for traditional varieties that they have developed or maintained. In practice, however, the registration of farmers' varieties has been limited, reflecting the barriers that individual farmers and communities face in navigating formal IP registration systems.[45]

The Act also establishes a National Gene Fund (Section 45) and provides for benefit-sharing with communities whose traditional knowledge contributes to the development of a registered variety. Section 26 enables the registration of new plant varieties by commercial breeders to be conditioned on benefit-sharing with any community that contributed TK relevant to the development of the

[42]Protection of Plant Varieties and Farmers' Rights Act 2001 (India) (PPVFR Act 2001), s 2(l) (definition of 'farmer').
[43]ibid s 39.
[44]International Union for the Protection of New Varieties of Plants (UPOV Convention) (adopted 2 December 1961, as revised 19 March 1991) <https://www.upov.int/upovlex/en/upov_convention.html> accessed 22 March 2025.
[45]ibid s 16(1)(d).

variety.[46] This benefit-sharing mechanism is, in principle, more rights-based than the BDA's ABS framework: it creates a specific legal entitlement to benefit-sharing tied to the contribution of TK, rather than merely authorising the NBA to impose benefit-sharing conditions at its discretion. However, the implementation of this mechanism has been slow, and the quantum and terms of benefit-sharing have not been systematically specified, leaving communities dependent on administrative goodwill rather than enforceable legal rights.

Ragavan's critical analysis of plant variety protection in the TK context notes that systems like the PPVFR Act, while more community-sensitive than UPOV-model frameworks, remain fundamentally structured around the requirements of a formal IP system registration, documentation, individual or group application that many TK-holding communities are not equipped to use without substantial assistance.[47] The gap between formal legal entitlements and practical community access to those entitlements is a persistent problem throughout India's TK protection framework, and the PPVFR Act is no exception.

6.2 GEOGRAPHICAL INDICATIONS AS A PROTECTION TOOL FOR TK

The Geographical Indications of Goods (Registration and Protection) Act 1999 (GI Act) provides a legal framework for the registration and protection of geographical indications signs identifying a good as originating in a particular geographic territory where a specific quality, reputation, or other characteristic is attributable to that geographic origin.[48] For TK protection, geographical indications have emerged as one of the more promising tools within the formal IP framework, precisely because they are well-suited to knowledge and products that are collective in origin, geographically rooted, and defined by cultural and environmental factors rather than by individual invention.

India has registered a significant number of GIs for traditional products. Some of the most prominent include Darjeeling Tea (the first Indian GI registered in 2004), Kancheepuram silk, Pochampally Ikat, Kondapalli toys, Kolhapuri chappals, and numerous traditional handicrafts, textiles, and food products.[49] These registrations provide legal protection against the use of the GI by producers outside the designated geographic area and against any misrepresentation of geographical origin. In principle,

[46]ibid s 26(1) (benefit sharing from Gene Fund).

[47]Ragavan (n 18) 28.

[48]Geographical Indications of Goods (Registration and Protection) Act 1999 (India) (GI Act 1999), s 2(1)(e).

[49]Darjeeling Tea GI (Geographical Indications Registry, India, Application No 1, registered 2004–05).

they allow communities of producers in specific regions to control the use of the GI and to benefit commercially from its association with quality and cultural heritage.

The Basmati rice controversy illustrates both the potential and the limitations of GI protection for traditional agricultural knowledge. India's challenge to RiceTec Inc's US patents over Basmati-type rice, and the subsequent strengthening of India's domestic GI framework for Basmati, demonstrated that GI protection can serve as a more appropriate tool than patent protection for defending agricultural TK, since it recognises regional origin and collective cultural value rather than requiring individual inventorship.[50] However, the controversy also demonstrated the limits of domestic GI registration as a mechanism for international protection: a GI registered in India has limited legal effect in foreign markets that do not provide equivalent GI protection, and the absence of a multilateral framework for mutual recognition of GIs creates significant gaps in the cross-border protection of agricultural TK.

Under TRIPS Articles 22 and 23, higher levels of GI protection apply to wines and spirits, but other products including traditional food products, textiles, and handicrafts receive only basic protection against misleading use of geographical indications.[51] India, along with other developing countries with rich GI traditions, has been pressing within the WTO for the extension of the higher level of protection to all products, not just wines and spirits. This campaign has been resisted by developed countries whose wine and spirits industries have established brands that would be affected. The resulting asymmetry leaves Indian traditional products with weaker international GI protection than European wines and spirits a disparity that has significant commercial consequences for TK-holding communities.

Sunder's theoretical lens is illuminating here. She notes that GI protection, when it works well, allows indigenous communities to assert authorship and claim participation in global markets precisely the kind of developmental and creative recognition that she argues TK discourse has historically denied to indigenous producers.[52] However, for GI protection to function in this empowering way, communities must be able to organise as collective rights holders, enforce their rights in foreign jurisdictions, and maintain standards of quality associated with the GI. All three of these conditions

[50]Basmati Rice controversy: RiceTec Inc, US Patent No 5,663,484 (partially cancelled after challenge by India, USPTO 2001); India's GI registration of 'Basmati' (Geographical Indications Registry, Application No 113).

[51]Agreement on Trade-Related Aspects of Intellectual Property Rights (n 31) arts 22–23.

[52]Sunder (n 27) 117.

require institutional capacity and legal support that many TK-holding communities in India currently lack.

6.3 THE STRUCTURAL LIMITATION: FRAGMENTATION ACROSS LEGAL REGIMES

Wilkof and Basheer's analysis of overlapping intellectual property rights provides a useful analytical framework for understanding a structural problem that runs through India's entire TK protection framework: the fragmentation of TK governance across multiple, imperfectly integrated legal regimes. TK-holding communities in India must navigate simultaneously the BDA's biodiversity access regime, the Patents Act's exclusion and disclosure framework, the PPVFR Act's plant variety protection system, the GI Act's geographical indication framework, and the TKDL's documentation regime each governed by different legislation, administered by different institutions, and offering different and often inconsistent forms of protection.[53]

This fragmentation has several harmful consequences. It creates confusion about which legal regime applies to any given TK-related situation. It requires communities to engage with multiple institutions simultaneously the NBA, the Plant Varieties Authority, the Geographical Indications Registry, the TKDL Trust without any unified point of entry or coordination mechanism. And it means that the gaps between regimes the TK that falls outside each individual regime's coverage can be substantial. Correa's call for a coherent sui generis TK protection system, which would provide a single, comprehensive legal framework specifically designed for TK, is directly relevant to this structural diagnosis.[54]

7. CONCLUSION

This chapter has examined India's domestic TK protection framework across its principal components: the constitutional and policy foundations; the Biological Diversity Act 2002 and the NBA's ABS mechanisms; the Patents Act's exclusion and disclosure provisions; the TKDL; and the specialised frameworks of the PPVFR Act and GI law. India's legal architecture is, by the standards of the developing world, sophisticated and multi-dimensional. It has produced some genuinely innovative institutional solutions the TKDL stands out as a globally recognised model and it has, in a number of specific instances, successfully prevented biopiracy through defensive legal action.

[53]Wilkof and Basheer (n 43) 28–30.

[54]Correa (n 23) 24.

Yet the critical literature converges on a shared diagnosis: India's framework is structurally oriented toward defensive protection keeping TK out of others' hands rather than toward conferring positive rights on TK-holding communities. The TKDL prevents external appropriation without enabling community ownership. The BDA authorises benefit-sharing without specifying enforceable entitlements. The PPVFR Act creates formal rights that many communities cannot access in practice. And the GI framework provides powerful protection in domestic law without equivalent international effect.[55]

Gupta's vision of a legal framework that not only prevents misappropriation but also actively supports grassroots innovation, community benefit-sharing, and the recognition of TK as a form of intellectual and creative achievement deserving of positive legal status has not been fully realised in India's current law.[56] Ragavan's structural critique that IP law's exclusion of community knowledge is not an oversight but a reflection of the ideological assumptions embedded in the system applies with equal force to India's domestic framework, which has absorbed the IP system's structural biases even in its attempts to correct them.[57]

Sunder's challenge to the legal system is perhaps the most pointed: does India's law genuinely treat TK-holding communities as inventors and creators, or does it continue to position them primarily as guardians of a national biological heritage whose value is determined by others? The analysis in this chapter suggests that the answer remains closer to the latter than the former.[58] The comparative analysis of Chapter 4 which examines the TK protection frameworks of Peru, Brazil, and the African Union will explore whether alternative legal models offer more promising pathways toward a rights-based framework that places communities at the centre, consistent with Phillips's vision of IP as an enabler of sustainable development and community empowerment.[59]

[55]Drahos (n 25) 11.
[56]Gupta (n 6) 18–20.
[57]Ragavan (n 18) 30.
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