



Sustainable Use and Legal Protection of Traditional Knowledge: A Comparative Study of India and Malaysia's Sui Generis IPR And Biodiversity

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Abstract. The paper compares the approaches taken by India and Malaysia to protect Traditional Knowledge without impeding innovation through their Intellectual Property and Biodiversity Laws. The paper employs doctrinal and comparative methods to examine India's Biological Diversity Framework, including the Geographical Indication Act and its Traditional Knowledge Digital Library. It then looks into Malaysia's system for access and benefit sharing and patent-related interfaces. The study finds that India's Digital Library prevents others from making false patent claims as it makes community knowledge accessible during the prior art search process. On the other hand, Malaysia has a better-defined process for obtaining prior informed consent and includes community representation in the licensing process. The study prescribes a hybrid which combines documentation with involvement, taking the strengths of both models. The hybrid approach also suggests reciprocal examiner access between India, Malaysia, and interested ASEAN partners. It also features layered, consent-based data governance; a model license with measurable protection and Livelihood Indicators; and a standard framework for green technology research with simpler methods for registering complaints. The paper concludes that this hybrid, which focuses on people and sustainability, can further humanise the law and reduce the risk of biopiracy. It can further turn research partnerships into real benefits for communities and ecosystems in the Global South.

Keywords: Access and Benefit Sharing; Biopiracy; Geographical Indications; Indigenous Communities; TKDL.

1 Introduction

Traditional Knowledge is usually held by communities and is often transmitted orally and linked to specific places. Conventional intellectual property rules emphasise individual authors and inventors. This approach leaves gaps when communities seek recognition and fair compensation for knowledge built over many generations. Misappropriation of medicinal and agricultural practices remains a serious problem. The risk increases when patent offices cannot find prior art recorded in non-English sources or in materials that are not formally documented.

India created the Traditional Knowledge Digital Library to address this gap. The database gives examiners better access to prior art and helps them identify what is already in the public domain. As a result, weak applications are filtered out at an early stage. The added visibility has prompted withdrawals and rejections, and it has deterred biopiracy [1]. However, defensive tools by themselves do not ensure just outcomes for communities. In many settings, benefits fail to reach the real knowledge holders, and local monitoring and remedies remain limited [2].

Malaysia has adopted an access and benefit-sharing framework that places community consent and participation at the centre. Institutions and practitioners are still building the required capacity. The broader aim should be a more humane approach to the law. Communities need protection against misuse. They should also have the means to use their knowledge to support secure livelihoods and to care for local ecosystems.

1.1 Objectives and Questions

This paper compares how India and Malaysia protect Traditional Knowledge through specialised intellectual property and biodiversity regimes. It also asks whether these laws enable sustainable and ethical innovation. The analysis considers defensive measures, such as codified prior art and rules governing the disclosure of origin. It then evaluates positive protection based on consent and benefit sharing. A further question is how far enforcement reaches the village level, and where it falls short.

The core inquiry is the design of a workable hybrid. The model would combine India's strengths in documentation and transparency with Malaysia's strengths in participatory licensing and clear procedures for prior informed consent. The aim is a system that prevents misuse, supports fair collaboration, and promotes responsible innovation. A second question is whether such a model can improve trust between researchers, firms, and communities while also advancing a green innovation agenda that supports conservation outcomes. A third question is how bilateral and regional cooperation can reduce duplication and prevent forum shopping, particularly through reciprocal access to databases and shared examination practices among patent offices.

1.2 Scope and Terminology

In this paper, “Traditional Knowledge” refers to community-held know-how, innovations, and practices maintained by Indigenous peoples and local communities, which are connected to biological resources and to their cultural heritage. Access and Benefit Sharing refers to legal arrangements that allow access to biological resources or associated knowledge on the basis of consent and mutually agreed terms for sharing monetary and non-monetary benefits, as framed by the Convention on Biological Diversity and the Nagoya Protocol [3],[4]. Prior Informed Consent denotes the requirement that communities agree to access with full information and without coercion. Defensive protection refers to measures that prevent the grant of inappropriate patents, such as searchable prior art databases and disclosure requirements [1]. Positive protection refers to rights and procedures that enable communities to authorize use and to receive fair benefits through licenses and contracts under national biodiversity or plant variety laws[5],[6]. Humanizing the law is used as an ethics-centered lens that prioritizes dignity, participation, equity, and ecological integrity in the design and operation of legal tools

1.3 Methodology

The paper adopts a doctrinal and comparative method. It analyses the text and structure of India’s Biological Diversity Act, the Geographical Indications framework, where relevant to community products, and the Traditional Knowledge Digital Library interfaces with patent examination. It compares these elements with Malaysia’s Access to Biological Resources and Benefit Sharing Act of 2017 and the Protection of New Plant Varieties Act of 2004 [5], [6], [7], [8]. The analysis is informed by official guidance and clearinghouse materials that describe procedures for consent, permits, and benefit sharing in Malaysia, including the date of legal enforcement [9]. It also draws on public reports and studies that document the effect of TKDL on patent practice and examiner behaviour in foreign offices, which helps to assess the deterrent value of documentation [1],[2].

1.4 Contribution and Roadmap

The paper contributes a practical hybrid design for countries that wish to align ethics and innovation with sustainability goals. It argues that India’s experience with codified prior art and third-party submissions can be paired with Malaysia’s clearer permit pathways and community representation in decision-making to improve consent quality, transparency, and value capture for communities [2],[5]. It proposes reciprocal examiner access to Traditional Knowledge databases and shared taxonomies to improve prior art searches across borders, supported by regional cooperation under the Nagoya framework [4]. It also suggests pilot model licenses for green technology research with measurable conservation and livelihood indicators, and it outlines capacity building for community paralegal support, valuation guidance, and standardised templates that reduce transaction costs. The paper’s roadmap is as follows. Part Two sets the ethical and governance foundations for humanising the protection of Traditional Knowledge in a sustainable society. Part Three analyses

India's biodiversity governance, geographical indications where community interests are salient, and the Traditional Knowledge Digital Library interface with patent practice, with attention to local enforcement. Part Four analyzes Malaysia's access and benefit sharing system and plant variety protection, then Part Four develops a comparative synthesis and a hybrid model with concrete cooperation steps. The conclusion presents policy recommendations and a brief agenda for future research and implementation.

2 Ethical And Governance Foundation For Humanising TK Protection

2.1 Conceptual Anchors: Ethics, Sustainability, and TK

Traditional Knowledge is a living and evolving body of insight. Communities refine it through practice, observation, and belief systems that are closely tied to land and water. It often concerns the use of biological resources, cultural expressions, and customary rules that guide stewardship. The Convention on Biological Diversity (UNCBD) stresses the necessity of the know-how and practices of indigenous communities and calls on states to respect, preserve, and maintain them [10]. The World Intellectual Property Organisation (WIPO) defines Traditional Knowledge as knowledge that is created, maintained, and transmitted within a community, and that often forms part of its cultural or spiritual identity [11]. This definition asks for a minimum ethical premise that law should begin with respect for community identity as a base.

Humanising the law requires attention to dignity and self-determination. The United Nations Declaration on the Rights of Indigenous Peoples has affirmed that all Indigenous peoples have the right to preserve and strengthen their own institutions. They have a right of decision-making on issues that have a direct or indirect effect on them [12]. This principle establishes a basic standard of consent and equitable conditions for parties outside of their group that are seeking access to knowledge or related genetic resources. The Nagoya Protocol also makes these principles legally binding by asking for prior informed consent and mutually agreed-upon terms for access and benefit sharing [13]. A human-centred approach views consent as a meaningful and ongoing process that promotes understanding and trust, rather than as a mere formality. It's the minimum morality that preserves the dignity of the party.

Sustainability is another basic pillar. Traditional Knowledge generally helps conserve natural resources by teaching followers how to use plants, animals, and landscapes carefully over time and through the seasons. Global evaluations of biodiversity have also emphasised the essential function of Indigenous and local knowledge in safeguarding ecosystems and maintaining biological variety [14]. Goal 15 of the Sustainable Development Goals asks for an end to the loss of biodiversity and for the promotion of the sustainable use of land-based ecosystems [15].

Dynamism is the third anchor. As societies are increasingly dealing with environmental stresses and evolving social needs, traditional knowledge also adapts. This is often hard for legal institutions to keep up with. Defensive tools (discussed below) can stop the grant of patents that cover things that communities already know. Positive tools can allow responsible use and ensure that advantages are shared fairly. The Convention on Biological Diversity asks for respect and maintenance by giving knowledge and ways that help safeguard biological diversity and utilise it in a way that is good for the environment. This helps both protect and use [10]. The WIPO account also states that Traditional Knowledge is constantly being created and shared, which means that laws need to be adaptable to changing times [11].

These groundings provide a well-defined measure for the centrality of an anthropocentric paradigm. The law ought to be respectful of people who know things. It must secure their rights, their consent, and their share of the benefits that accrue through use.

2.2 Protection Poolkits: Defensive vs Positive Protection

Defensive Protection. Bad patents are to be prevented by setting up the system in such a way that it becomes easy for examiners to find and view community knowledge. In India, the Traditional Knowledge Digital Library is in the process of translating and transcribing ancient Ayurvedic manuscripts into digital format. After that, the material can serve as prior art for examiners at major patent offices. Such visibility has disrupted the claims that would have otherwise worked, if not for linguistic obstacles or defined allusions [16]. Search and examination are available to examiners under access agreements with the European Patent Office and other offices. This makes screening stronger at an early stage [17].

In patent law, the disclosure-of-origin rule is another way to protect yourself. It demands that anyone who applies to say where they got any genetic resources or information that went into making an invention. The rule does not, by itself, provide people the right to share in benefits. It makes things clearer and helps authorities check for compliance [18]. Recent talks between countries are trying to find a common starting point for disclosure. The objective is to enable the traceability of genetic resources and Traditional Knowledge across various patent systems [19].

Positive Protection. The objective is to secure community authorisation and fair benefit sharing for new uses of knowledge or associated biological resources. The Nagoya framework advances access and benefit sharing through prior informed consent and mutually agreed terms. It also promotes the use of adaptable model clauses for research and innovation [20]. The Access to Biological Resources and Benefit Sharing Act in Malaysia creates a permit pathway. It embeds consent and sets out how benefits are to be negotiated and monitored in practice [5]. The issued guidance explains permit steps and lists required documents. This reduces uncertainty for researchers and communities [19]. Geographical indications operate in parallel as collective signs that link goods to place and reputation. When ecological practices are

written into product specifications, the system can reward stewardship through market recognition and traceability. The Geographical Indications of Goods Act in India provides the legal basis for such collective branding and for organising producer groups [21].

Defensive and positive measures work best when paired with examiner access and clear community representation in licensing. Examiner portals that present traditional knowledge as searchable prior art lower the immediate risk of misappropriation. Licensing committees or designated community bodies help to make consent meaningful and to secure fair terms. Defensive databases also guide researchers away from duplication by showing what is already known. Positive contracts can then steer new work toward unmet needs identified by communities.

Design Trade-Offs. Wider access to digitised knowledge strengthens deterrence against weak patents. It also raises concerns about control over sensitive information and the risk of unintended disclosure. Practical toolkits for documenting traditional knowledge therefore recommend confidentiality safeguards, tiered access, and community-specific protocols to preserve secrecy where needed [19]. Broader debates on Indigenous data governance emphasise collective rights and shared responsibilities in data use, with the goal of creating value that aligns with community priorities rather than only with open-access goals [22], [23]. A second trade-off concerns codification and customary law. Codification improves interoperability with patent and research systems. It can also reduce context and separate knowledge from the norms that govern its use. Documentation guides therefore recommend project designs that record customary conditions of use and embed community consent rules in record metadata, so that users understand the terms attached to knowledge [19]. A balanced approach links accessible prior art and disclosure practices with participatory contracts and careful data governance. This combination deters misappropriation and supports responsible innovation that communities can trust.

3 India's Sui Generis Architecture (Biodiversity, Gis, TKDL)

3.1 Biodiversity and ABS Governance under the Biological Diversity Framework

India's Biological Diversity framework is built on a triple-tier institutional design that links national, state, and local bodies. The National Biodiversity Authority provides approvals for access to biological resources and associated knowledge in cases with foreign participation, oversees benefit-sharing agreements, and issues guidance to harmonize practice. State Biodiversity Boards regulate access for Indian entities within their jurisdictions and support compliance by domestic users. At the local level, Biodiversity Management Committees are made in every local self-government to represent community interests and to serve as the primary interface for documentation and benefit claims. The framework is set out in the Biological Diversity Act and the Biological Diversity Rules, which together define powers, procedures, and the relationship among the three levels [7], [24].

The process for prior informed consent and mutually agreed terms operates through statutory applications and agreements. Applicants seeking access submit information on the resource, the purpose of use, likely commercial value, and proposed sharing. Approvals result in a benefit-sharing agreement that specifies monetary and non-monetary terms. The Guidelines on Access to Biological Resources and Associated Knowledge and Benefits Sharing Regulations of 2014 give procedural shape to this process and provide parameters for calculating payments in commercial use [25], [26]. The same framework governs requests to submit an application for intellectual property based on studies that used biological resources or related information from India, which need the National Biodiversity Authority's prior clearance [7].

Community registers and claims are a central part of the architecture. Biodiversity Management Committees compile People's Biodiversity Registers to document local resources, uses, and knowledge in a format recognized by authorities. The National Biodiversity Authority has issued formats and guidance for the creation of these registers, which are intended to inform conservation plans and to support community benefit claims [27], [28], [29]. These registers help trace the source of knowledge and resources when access is sought, and they also provide a baseline for participation by customary authorities and local institutions during negotiations.

Benefit sharing formulas under the 2014 Regulations include percentages linked to purchase price for traders and manufacturers, and a percentage of gross ex factory sales for products developed from accessed resources. Training materials grounded in the Regulations describe ranges such as one to three per cent of purchase price for traders, three to five per cent for manufacturers, and a range of zero point one to zero point five per cent of annual gross ex factory sales for products, with higher upfront payments for high-value products [30]. Monetary sharing is complemented by non-monetary options, which include technology transfer, local value addition, and support for conservation. The distribution of monetary benefits has focused on directing proceeds to local committees and recognised benefit claimants. According to practice reports, the 2014 Regulations required most rewards to be given to Biodiversity Management Committees or paid directly to claimants. This made local incentives stronger [31], [32].

There are real problems with local implementation. Users and communities don't all know about it, which is a lack of awareness issue. Timelines can be long. Valuation of knowledge often lacks clear benchmarks. National implementation notes state that the 2014 Regulations increased uptake by standardising procedures, but that continued capacity building at state and local levels is still needed to sustain compliance [33].

Monitoring relies on reporting duties in benefit-sharing agreements and on oversight by the National Biodiversity Authority and State Boards. Available remedies include cancellation of approvals and the pursuit of monetary penalties or prosecution for breaches of access and approval requirements, with penalties and offences set out in the Act [34].

Sustainability is woven into the legal design through conservation duties, use restrictions, and incentives for stewardship. The Act states the objectives of conservation and sustainable use and enables State Boards to restrict activities that undermine these goals. [7] People's Biodiversity Registers are meant to guide local conservation action plans and to identify sensitive resources where use should be carefully managed [28], [29]. When benefit sharing directs funds to community conservation and to local livelihoods that depend on healthy ecosystems, it aligns research and innovation with stewardship. The overall logic is that clear consent, fair sharing, and active local representation can turn access into a pathway for both development and conservation, provided that monitoring is credible and that remedies are real.

3.2 Geographical Indications as Community Centred IP

India's Geographical Indications system offers a collective form of protection that links reputation to place and to shared know-how. The statute protects goods that originate in a specific region, which enables a registered proprietor and permitted users to access a particular quality, reputation, or other attribute that is essentially attributable to that origin. It allows the users to enforce the indication against misuse. The scheme relies on a specification that defines the product, the geographical area, and the method of production, and on an inspection structure that oversees compliance. This structure ties authenticity and traceability to documentary controls and to collective governance through producer bodies and authorities recognized under the registration [21]. Registration of Darjeeling Tea illustrates how origin and method are combined with a control plan that includes authorisation of users and monitoring of marks, which helps consumers and examiners identify genuine products and locate responsibility for quality. [33]

Product specifications may include ecological and process standards when these features shape quality or reputation. The Darjeeling Tea program says that growing, harvesting, and processing must all happen in the same district. Product specifications may include ecological and process standards when these features shape quality or reputation. The Darjeeling Tea programme says that growing, harvesting, and processing must all happen in the same district with conventional methods, along with fully compliant products as per the rules of the Tea Board of India, which includes products' look, smell, and taste to standardise local farming practices. By these rules, GI preserves territory-related attributes and incentivises different types of producers [33].

International guidelines suggest that GI can help in sustainable rural development if standards for products reflect local resource connections and governance ensures accrual of benefits to the farmers. This promotes a green GI strategy, which means that environmental protections and social standards are included in the specifications and inspection plans to encourage long-term stewardship [34].

Harder to practice in real life. Various producer groups have differing capacities to grant permissions, maintain records and pay for inspections. Poor skills

can give you less confidence in the indication. Inspection agencies have to strike a balance between being strict and being affordable so that small producers don't face huge costs in complying. This must be consistent for all years, around and for all producers, also if spread out. This requires training and shared protocols that can be audited without heavy paperwork. Market capture is another risk. Intermediaries with better access to finance and distribution may take a large share of the premium, while smaller producers struggle to upgrade or to signal authenticity. Experience in Asian value chains shows that strengthening producer groups and clarifying benefit distribution within the GI governance system are essential to achieve inclusive outcomes and to prevent the indication from becoming a label that benefits only a few firms [35]. A credible Indian GI model therefore rests on three pillars. The first is clear eligibility and collective governance anchored in the statute and the product specification. The second is authenticity and traceability through practical inspection plans that can be scaled to small producers. The third is steady investment in producer capacity so that the value created by reputation is shared and sustains the ecological and cultural foundations of the indication [21], [33], [35].

3.3 TKDL and patent system interfaces

The Traditional Knowledge Digital Library makes community knowledge visible to patent examiners in a structured form that can be searched alongside scientific prior art. By translating formulations from classical texts into multiple languages and mapping them to patent classifications, it allows examiners to find relevant prior art during search and examination. The effect is a direct deterrent against misappropriation. Applications that merely repackage known traditional uses can be detected at an early stage. Applications can then be refused or amended. Official reports indicate that hundreds of filings have been set aside, withdrawn, or altered on the basis of TKDL citations. This shows measurable screening at low cost to the state and to communities [2]. Research cited by the World Intellectual Property Organization indicates a significant reduction in efforts to assert claims over content derived from Indian medicinal traditions [1].

When search examiners have direct access to TKDL holdings through established access agreements, deterrence can become stronger. Different offices can look at the same digital corpus and use it to check that their ratings of novelty and creative steps have not already been affected by the documented state of the prior art [1]. A new WIPO convention, agreed upon by member countries in May 2024, stipulates that when inventions utilise genetic resources, applicants must disclose the origin of those materials and the Indigenous or local group from which they obtained information about them [36]. The disclosure rule works with defensive databases by enabling authorities to find the links between claimed innovations and source knowledge across borders. By this, the compliance checks are made stronger both for the side of filing and the opposition [36].

There have been claims that were disputed using TKDL references and did not go through [37]. Similarly, in Europe, third-party observations or pre-grant oppositions led to withdrawals or changes when examiners looked into TKDL

citations [2]. These cases show that through these initiatives, not every such dispute will need to see the light of the court and holders will feel more confident in the preservation of their traditional knowledge.

Even with these improvements, gaps remain. The ability of state agencies and communities to enforce laws and provide benefits is what enables them to function effectively. Capacity differs from district to district, which can make it harder to get help when someone steals something outside of the patent office. This can leave people in communities unclear about how decisions concerning documentation are made and what benefits will result when digitised entries affect research or screening results [43] [38]. Another sensitive issue that needs careful, continuing attention is consent for documentation. Although TKDL draws largely on material in the public domain, some communities may prefer that certain knowledge remain restricted or be recorded with conditions. This concern links to data governance choices about tiered access and about how sacred or sensitive knowledge is treated. Language and valuation challenges also persist. Even with multilingual entries, important nuances of practice are hard to capture in standardised descriptors. There is no simple method to value community contributions when documentation prevents a patent that might otherwise have been granted. These gaps suggest that defensive documentation should be paired with participatory licensing pathways and with ethical data protocols, so that deterrence at the patent office translates into trust and tangible gains for knowledge holders.

4 Malaysia's Emerging Framework

4.1 ABS Architecture and Participatory Licensing

Malaysia's Access to Biological Resources and Benefit Sharing Act establishes a permit-based system that brings prior informed consent and mutually agreed terms into a clear administrative pathway for research and commercialization. Applications must set out the resource, the location, the intended use, and the proposed terms for sharing benefits, and approval is conditioned on documented consent from the relevant provider of resources or associated knowledge. The Act identifies users' duties, allows the competent authority to attach conditions to permits, and requires that access be refused where consent is absent or information is incomplete [5]. Official guidance explains the flow from application to decision, lists the documents that applicants must file, and provides templates for benefit-sharing clauses that can be adapted to different projects [39]. Public-facing portals support applicants and communities by hosting forms, procedural notes, and contact points for permitting authorities, which increases transparency about timelines and responsibilities [40]. Public-facing portals help applicants and communities by providing forms, procedural notes, and contact information for permission authorities. This clarifies the timetables and duties [40].

A key aspect of the Malaysian strategy is to involve people at the points of consent and licensing. The guidance says that an application must get permission from the resource provider and the person who holds any related traditional knowledge. It also states what evidence is required to demonstrate that permission was provided freely and with sufficient information [39]. The permit pathway allows the authority to verify that community views have been documented and that representatives have been identified through their usual methods. This reduces arguments after access has begun. Instead of just one signature at the end of discussions, the design views consent as a process with distinct steps and accompanying paperwork. The focus on documented permission and written terms connects participation to administrative monitoring, giving officials the power to suspend or cancel permits when rules are broken [5].

A step-by-step user guide has helped researchers and businesses feel less unsure at first. The need to file consent agreements has made it easier for community members to have a say in decisions [39]. National portals and clearinghouse entries now bring practice notes and legal materials together in one place, but ongoing training for applicants and community representatives remains important if documentation is to result in informed and balanced agreements [40], [41].

Sustainability checks are built into permits and their conditions. The Act allows the authority to set terms that protect biodiversity conservation and the sustainable use of resources. It can also require monitoring reports at intervals suited to the activity [5]. Guidance materials list non-monetary benefits that support stewardship, such as technology transfer, capacity building, and local value addition. These can be written into mutually agreed terms alongside monetary payments [39]. Monitoring of agreed benefits is supported by reporting duties and by the authority's power to review compliance, which allows corrective directions or suspension when delivery falls short [5].

4.2 Patent Law Touchpoints and the Registry Gap

Malaysia's patent system intersects with access and benefit sharing through procedural touchpoints that are becoming more explicit. Applicants file with the Intellectual Property Corporation of Malaysia and follow examination practices set out in national guidance, with search and substantive assessment informed by the Patents Act and Regulations. The office publishes manuals and examination guidelines that describe how examiners assess novelty, inventive step, and sufficiency, and how applicants should structure disclosures in the specification [42], [43]. At the same time, international regulations are moving toward greater openness about genetic resources and related traditional knowledge. If an invention is based on inputs from Indigenous or local communities, the new WIPO treaty on genetic resources requires patent applicants to disclose the nation of origin and, if applicable, the Indigenous or local community that provided associated information [44]. This

development strengthens the policy case for national practice that connects patent disclosures with access permits and consent documentation issued under the Access to Biological Resources and Benefit Sharing Act.

The disclosure theme is also visible in Malaysian policy statements that emphasize information about biological resources or Traditional Knowledge in the context of patent applications and stress consistency with access and benefit-sharing principles [45]. Examiner practice remains bounded by the documentary record. Examiners can request clarification and can rely on work sharing or foreign reports under cooperation arrangements that expedite prosecution, but they generally cannot compel production of access permits unless the law or regulations make them a formal filing requirement [43], [46]. This places weight on clear guidance to applicants to show compliance with access and benefit sharing where relevant, and on coordination between the patent office and the competent authority administering permits.

Unlike India's large-scale TKDL, Malaysia does not operate a consolidated, publicly accessible national repository that covers traditional knowledge at comparable breadth. A pilot Malaysia Traditional Knowledge Digital Library began in 2009 to gather information on traditional knowledge and genetic resources in digital form, but it does not function as an open examiner portal with global coverage similar to TKDL [47]. The absence of a mature public registry has both benefits and drawbacks. It can protect confidentiality and lower the risk of disclosing sensitive knowledge. It also reduces unwanted exposure. However, it limits searchability for examiners and weakens the presentation of standardized prior art that could deter questionable claims at the outset. It further places a heavier burden on applicants and officials. They have to document the source of knowledge in each case with permits and testimonies from witnesses. The record should reflect who knows and who authorized access, on what terms.

These design decisions affect enforcement, valuation, and biopiracy prevention. When origin disclosure is a statutory filing requirement, authorities may cross-check permit numbers and consent papers against access and benefit-sharing records. This improves compliance and reduces the chance that patents are granted on undisclosed access [44]. Where disclosure functions only as a recommended practice, rather than a filing obligation, enforcement shifts to post-grant challenges or administrative review. That route is usually more costly for communities. Valuation also becomes harder without a searchable registry. There is less standardised evidence of prior art and fewer benchmarks to assess how Traditional Knowledge contributes to claimed outcomes.

A good path is to protect confidentiality while building a curated interface. Such an interface would let examiners and authorised officials verify Traditional Knowledge references without revealing sensitive details. It would also link patent disclosures to the access-permit system. This approach lowers biopiracy risks without pushing

protected knowledge into the public domain. It further aligns patent procedures with participatory licensing under national access and benefit-sharing law.

5 Comparative Synthesis And Proposed Hybrid

India's approach is strongest where defensive documentation and visibility within the patent system matter most. The Traditional Knowledge Digital Library shows that well-indexed prior art can deter questionable claims and can change applicant behaviour before disputes arise [1]. Formal access arrangements give examiners direct pipelines to this material. Search and examination can then align with what communities have long practised and recorded [2]. India also shows how geographical indications can elevate place-linked knowledge when product specifications and control plans are clear, and when authorised users are monitored transparently [33]. International guidance on origin-linked quality further explains that such schemes can support rural development by rewarding practices that maintain the qualities of a local ecology [34].

Malaysia's strength lies in procedural clarity for access and benefit sharing, and in a rules-based insistence on recorded consent. The user guide to the national access law sets out the steps, documents, and consent evidence that applicants must provide. This also makes things a lot less ambiguous for researchers and communities, and it helps administrators check for compliance [39]. The Act gives the authority the power to set conditions. It lets them require monitoring and suspend or revoke permits if the rules aren't followed. This makes community voice a key part of the licensing process, encouraging people to get involved from the start [5]. These aspects work together to create a participatory model in which consent is an ongoing process, with documentation and checkpoints, rather than just a one-time formality.

A workable hybrid advances documentation and participation together. India's lesson is that examiners need structured access to prior art that reflects traditional formulations in familiar languages and classifications. Malaysia's lesson is that community representation and recorded consent must sit at the centre of licensing decisions. The combined design would keep a TKDL-style interface available to examiners and competent authorities, while requiring that access to resources or associated knowledge proceed only through permits that show prior informed consent and that specify how benefits will be shared and monitored [48],[49],[50].

Reciprocal examiner access is the next building block. A secure gateway between India, Malaysia, and willing ASEAN partners would allow examiners to verify traditional knowledge references across borders using shared taxonomies and multilingual metadata. The new WIPO treaty on genetic resources and associated traditional knowledge confirms the policy direction by disclosing origin and, where relevant, the identifying community as a formal part of the patent system when inventions are based on such inputs [44]. A bilateral arrangement could pilot the

treaty's logic by linking examiner portals to national access records so that disclosures in patent files can be cross-checked against permit numbers and consent documents during search and examination [44].

Ethical data governance is essential if documentation is to support trust. A tiered access model would differentiate between material suitable for broad examiner use and material that should be visible only to authorized officials under strict conditions. Communities would be asked for their consent before digitization and would retain an option to opt out of sacred or sensitive knowledge. The CARE Principles for Indigenous Data Governance offer a benchmark for collective benefit, authority to control, responsibility, and ethics that can be adapted to national contexts and written into data sharing agreements between offices [23]. Benefit sharing could also be triggered by queries or verified uses where appropriate, for example, through small levies on high-volume commercial searches that fund local stewardship programs, subject to national law.

A green technology transfer protocol should be developed to turn consent and disclosure into measurable sustainability outcomes. An ASEAN-India template for prior informed consent and mutually agreed terms could set minimum requirements for conservation indicators, livelihood metrics, and grievance pathways that apply to climate and bio-based research. The ABS Clearing House already provides a platform to publish measures and model clauses, which can host the template and related practice notes so that users and communities can access them in one place [40]. Aligning the protocol with Sustainable Development Goal Fifteen would ensure that biodiversity conservation and restoration are treated as primary outputs of research partnerships rather than as afterthoughts [15].

Capacity building completes the hybrid approach. Community paralegal networks can translate procedures into practice. They can assist with consent meetings, record keeping, and monitoring reports. Valuation guidance can supply shared reference points for pricing knowledge contributions. It can also help structure non-monetary benefits such as technology transfer and local value addition. Standard-form licences can reduce transaction costs while leaving space for community-specific terms. Simple auditing toolkits can help authorities and communities verify the delivery of agreed benefits without heavy paperwork.

The combined package is coherent and practical. Defensive digitisation, reciprocal examiner access, ethical data governance, a common green research protocol, and grounded capacity support work together to humanise the governance of traditional knowledge. The likely results are fewer improper patents at the threshold, clearer and fairer licensing on the ground, and a stable link between research, livelihoods, and ecosystem health.

Actionable steps follow from this synthesis. First, both countries should invest in joint capacity building for community representatives, administrators, and researchers. This will support consent meetings, benefit negotiations, and monitoring on equal terms. Second, the patent offices should create reciprocal examiner access. Examiners should be able to search each other's traditional knowledge collections through shared taxonomies and multilingual entries, with safeguards for sensitive material. Third, access authorities should publish model licences for access and benefit sharing. These should include clear sustainability metrics for conservation and livelihoods, and set simple reporting duties that are practical to implement. Fourth, geographical indication practice should gradually incorporate ecological or process standards where these are integral to quality and reputation, supported by practical inspection plans that small producers can meet. Fifth, remedies and oversight should reach the village level through simple complaint routes, periodic field checks, and the power to suspend or adjust terms when delivery falls short.

The implementation roadmap can begin with pilot projects in a few districts and research institutions. Inter-office memoranda of understanding between patent offices and access authorities can set out data sharing rules, confidentiality tiers, and procedures for cross-checking disclosures against permit records. Evaluator dashboards can present simple indicators that track consent quality, delivery of agreed benefits, and conservation outcomes. Periodic social and ecological audits can verify that benefits have reached intended groups and that resource use remains within safe limits. Lessons from pilots should be folded back into guidance so that procedures become lighter, clearer, and more predictable over time.

6 Conclusion

This paper argues that a people-centred, sustainability-aligned hybrid is the most credible route to humanise the governance of traditional knowledge while supporting responsible innovation. India demonstrates the value of documentation and transparency through a digitised prior art system. It enables examiners to identify what is already known and to screen out questionable claims at an early stage. Malaysia demonstrates the value of a clear access pathway that records consent and gives communities a seat in licensing decisions. When these strengths are combined, the result is a framework that prevents misappropriation at the threshold and builds fair partnerships on the ground. It links knowledge to place, makes voice and consent effective, and connects research to stewardship outcomes that matter for people and for ecosystems.

Future research should measure ecological outcomes and community welfare linked to traditional knowledge-based innovation using transparent indicators and open methods. Future studies ought to assess ecological impacts and community welfare associated with traditional knowledge-based innovation through transparent indicators and methodologies. Comparative research should consider the regional

potential for scaling hybrid with due consideration of local customs. The true test will be ensuring that examiner access, access permissions and data governance all work together. Regional expansion ought to occur gradually and incrementally. With a careful approach, communities would get long-lasting benefits from the information they protect, and institutions would have clearer standards for how to use it fairly and responsibly.

References

1. World Intellectual Property Organization. (2011). Protecting India's Traditional Knowledge. WIPO Magazine. <https://www.wipo.int/web/wipo-magazine/articles/protecting-indias-traditional-knowledge-37721>
2. Council of Scientific and Industrial Research. (2025). Traditional Knowledge Digital Library Unit. <https://www.csir.res.in/en/documents/tkdl>
3. Convention on Biological Diversity. (n.d.). List of Parties to the Nagoya Protocol. <https://www.cbd.int/abs/nagoya-protocol/signatories>
4. United Nations Treaty Collection. (n.d.). Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits. https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-8-b&chapter=27&clang=_en
5. Government of Malaysia. (2017). Access to Biological Resources and Benefit Sharing Act 2017 [Act 795]. <https://faolex.fao.org/docs/pdf/mal176890.pdf>
6. Government of Malaysia. (2004). Protection of New Plant Varieties Act 2004 [Act 634]. <https://faolex.fao.org/docs/pdf/mal47516.pdf>
7. Government of India. (2002, with 2023 amendment note). The Biological Diversity Act, 2002. https://www.indiacode.nic.in/bitstream/123456789/21545/1/the_biological_diversity_act%2C_2002.pdf
8. MyABS Malaysia. (n.d.). Access and Benefit Sharing Clearing House. <https://myabs.gov.my/>
9. MyBIS. (n.d.). User's Guide to the Access to Biological Resources and Benefit Sharing Act 2017. <https://www.mybis.gov.my/pb/4497>
10. Convention on Biological Diversity. (n.d.). Article 8. In-situ Conservation. <https://www.cbd.int/convention/articles/?a=cbd-08>
11. World Intellectual Property Organization. (n.d.). Traditional Knowledge. <https://www.wipo.int/tk/en/tk/>
12. Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits. *Supra* https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-8-b&chapter=27&clang=_en
13. United Nations. (n.d.). United Nations Declaration on the Rights of Indigenous Peoples. <https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html>
14. IPBES. (2019). Global assessment report on biodiversity and ecosystem services: Summary for policymakers. <https://www.ipbes.net/global-assessment>
15. United Nations. (n.d.). Sustainable Development Goal 15. <https://sdgs.un.org/goals/goal15>

16. World Intellectual Property Organization. (2020). Protecting India's Traditional Knowledge. WIPO Magazine. <https://www.wipo.int/web/wipo-magazine/articles/protecting-indias-traditional-knowledge-37721>
17. Council of Scientific and Industrial Research. (n.d.). Traditional Knowledge Digital Library. <https://www.tkdil.res.in/tkdil/langdefault/common/Abouttkdil.asp?GL=Eng>
18. World Intellectual Property Organization. (2011). Technical Study on Disclosure Requirements in Patent Systems for Genetic Resources and Traditional Knowledge. https://www.wipo.int/edocs/pubdocs/en/tk/786/wipo_pub_786.pdf
19. World Intellectual Property Organization. (2017). Documenting Traditional Knowledge: A Toolkit. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1049.pdf
20. Convention on Biological Diversity. (2021). The Nagoya Protocol on Access and Benefit Sharing factsheet. <https://www.cbd.int/abs/infokit/revised/web/factsheet-nagoya-en.pdf>
21. Government of India. (1999). The Geographical Indications of Goods (Registration and Protection) Act, 1999. <https://www.indiacode.nic.in/bitstream/123456789/1981/5/A1999-48.pdf>
22. Malaysia Biodiversity Information System. (n.d.). User's Guide to the Access to Biological Resources and Benefit Sharing Act 2017. <https://www.mybis.gov.my/pb/4497>
23. Carroll, S. R., et al. (2020). The CARE Principles for Indigenous Data Governance. *Data Science Journal*, 19(43). <https://datascience.codata.org/articles/10.5334/dsj-2020-043>
24. Convention on Biological Diversity. (2020). Implementation of Nagoya Protocol in India (country information). <https://www.cbd.int/doc/c/6f5f/3df0/77f5febe31684da01cf936f6/india-final-abs-cbd-en.pdf>
25. Government of India. (2014). Guidelines on Access to Biological Resources and Associated Knowledge and Benefits Sharing Regulations, 2014 (Notification). <https://kbb.karnataka.gov.in/storage/pdf-files/notification%20Eng/ABS-Regulations-2014-Notification%281%29.pdf>
26. Government of India. (2004). Biological Diversity Rules, 2004. <http://nbaindia.org/uploaded/Biodiversityindia/Legal/33.%20Biological%20Diversity%20Rules,%202004.pdf>
27. National Biodiversity Authority. (2013). People's Biodiversity Register Format.
28. National Biodiversity Authority. (n.d.). People's Biodiversity Registers Guidelines (slides). https://nbaindia.org/uploaded/pdf/PPT_PBRs_Guidelines.pdf
29. Watershed Organisation Trust. (2015). People's Biodiversity Register: How to Manual. https://wotr-website-publications.s3.ap-south-1.amazonaws.com/Peoples_Biodiversity_Register_How_to_Manual.pdf
30. National Law School of India University. (2019). Training Manual on Access and Benefit Sharing. <https://abs.nls.ac.in/wp-content/uploads/2019/06/Training-Manual-on-Access-and-Benefit-Sharing.pdf>
31. Indo German Biodiversity Programme. (2020, Nov. 17). Benefit Sharing with Irula Community in Tamil Nadu. <https://www.indo-germanbiodiversity.com/project-details-285.html>
32. National Law School of India University. (2023). Biodiversity and Access and Benefit Sharing in India (ABS factsheet). https://abs.nls.ac.in/?page_id=219

33. Tea Board India. (n.d.). Darjeeling Tea: Geographical Indication, Certification Mark and Control Regulations and authorized user scheme.
<https://www.teaboard.gov.in/TEABOARDCSM/NzI=>
34. Government of India. (2002). The Biological Diversity Act, 2002 provisions on offences and penalties.
https://www.indiacode.nic.in/bitstream/123456789/21545/1/the_biological_diversity_act%2C_2002.pdf
35. Food and Agriculture Organization. (2018). Strengthening sustainable food systems through geographical indications.
<https://openknowledge.fao.org/items/a3037ba9-725d-41e4-af60-bac5be9cf9ca>
36. World Intellectual Property Organization. (2024, May 24). WIPO Member States Adopt Historic New Treaty on Intellectual Property, Genetic Resources and Associated Traditional Knowledge.
https://www.wipo.int/pressroom/en/articles/2024/article_0007.html
37. Down To Earth. (2015, August 4). India opposes patent application by British company.
<https://www.downtoearth.org.in/governance/india-opposes-patent-application-by-british-company-50657>
38. Fredriksson, M. (2021). India's Traditional Knowledge Digital Library and the politics of protecting knowledge. *Journal of Developing Societies*, 38(1), 27–48.
<https://pmc.ncbi.nlm.nih.gov/articles/PMC9999701/>
39. Malaysia Biodiversity Information System. (n.d.). User's Guide to the Access to Biological Resources and Benefit Sharing Act 2017. *Supra* note 22.
<https://www.mybis.gov.my/pb/4497>
40. MyABS Malaysia. (n.d.). Access and Benefit Sharing Portal and application materials. <https://myabs.gov.my/>
41. Access and Benefit-sharing Clearing-House. (n.d.). Malaysia country profile and legislative measures. <https://absch.cbd.int/countries/MY>
42. Intellectual Property Corporation of Malaysia. (n.d.). Patent basics and examination resources. <https://www.myipo.gov.my/patent-basics/>
43. Intellectual Property Corporation of Malaysia and JPO. (2014). Patent Examination Guidelines of Malaysia (English version).
https://www.jpo.go.jp/e/system/laws/gaikoku/document/index/malaysia-e_patent_exam_guidelines.pdf
44. World Intellectual Property Organization. (2024). WIPO Treaty on Intellectual Property, Genetic Resources and Associated Traditional Knowledge: Summary.
https://www.wipo.int/treaties/en/ip/gratk/summary_gratk.html
45. Government of Malaysia. (2024). Responses by the Government of Malaysia to USTR inquiry on intellectual property and ABS.
https://downloads.regulations.gov/USTR-2024-0023-0074/attachment_1.pdf
46. Henry Goh. (2024). Guide to intellectual property in Malaysia (PPH and examination practice). <https://www.henrygoh.com/downloads/ip-guide-en.pdf>
47. Boosting Malaysia's National Intellectual Property System for Innovation.
https://www.oecd.org/content/dam/oecd/en/publications/reports/2015/09/boosting-malaysia-s-national-intellectual-property-system-for-innovation_g1g5733b/9789264239227-en.pdf
48. Associated Press. (2024, May 24). UN countries adopt treaties to better trace origins of genetic resources under the global patent system.
<https://apnews.com/article/96f11b391faff7c690afddae397722ca>
49. National Biodiversity Authority. (2021). Access and Benefit Sharing in India: A Handbook for Practitioners. http://nbaindia.org/uploaded/pdf/IDB_ABS.pdf

50. Food and Agriculture Organization. (2009). Linking people, places and products: A guide for promoting quality linked to geographical origin and sustainable geographical indications. <https://www.fao.org/3/i1760e/i1760e.pdf>

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