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Governing Tradition in the Digital Age: Traditional Knowledge Repositories and Geographical Indications in Kerala

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Abstract

The digitization of traditional knowledge (TK) and the institutionalization of Geographical Indications (GIs) have become central components of India's contemporary intellectual property governance. These mechanisms are officially framed as instruments for safeguarding indigenous heritage, preventing biopiracy, and promoting rural development. Yet their socio-political consequences remain insufficiently examined. This article investigates the political economy of digital TK repositories and GI governance in Kerala, focusing on how legal infrastructures and digital platforms reshape power relations between communities, state institutions, and market intermediaries. Drawing on qualitative fieldwork, document analysis, and institutional mapping, the study demonstrates that while digitization enhances legal visibility, it simultaneously translates embodied knowledge into bureaucratic categories that marginalize local epistemologies. Likewise, GI registration often generates uneven economic outcomes, privileging legal and commercial intermediaries over primary knowledge holders. Employing an interdisciplinary framework combining political economy, science and technology studies, and epistemic justice, the article conceptualizes TK repositories and GI regimes as socio-technical systems embedded within postcolonial governance structures. The findings reveal three interlinked dynamics: the commodification of heritage through legal formalization, intermediary capture within GI value chains, and persistent epistemic asymmetries in digital knowledge infrastructures. The article concludes by proposing community centered metadata governance, participatory GI institutions, and legally enforceable benefit-sharing mechanisms as pathways toward more equitable knowledge protection. By situating Kerala as a representative Global South case, the study contributes to broader debates on intellectual property, development, and epistemic justice in the digital age.

Keywords: Traditional Knowledge; Digital Repositories; Geographical Indications; Kerala; Political Economy; Epistemic Justice; Intellectual Property; Heritage Governance; Postcolonial Studies.

1. Introduction

Traditional knowledge (TK) constitutes a foundational yet historically marginalized domain of human understanding. Embedded within agricultural practices, medicinal systems, artisanal production, and ecological stewardship, TK represents cumulative collective wisdom transmitted intergenerationally through lived experience rather than formal documentation. For centuries, such knowledge systems operated largely outside codified legal frameworks. However, with the globalization of intellectual property regimes and the expansion of digital infrastructures, traditional knowledge has increasingly become an object of institutional governance.

In India, two major policy instruments dominate contemporary efforts to protect TK: digital knowledge repositories, most notably the Traditional Knowledge Digital Library (TKDL), and the Geographical Indications (GI) regime established under the Geographical Indications of Goods (Registration and Protection) Act, 1999. These initiatives are widely presented as progressive mechanisms designed to prevent biopiracy, preserve cultural heritage, and enhance rural livelihoods. Yet beneath this normative framing lies a more complex political economy in which heritage becomes legible to law and markets through processes of classification, digitization, and certification.

Kerala offers a particularly instructive site for examining these dynamics. Renowned for its Ayurvedic traditions, spice cultivation, and artisanal crafts, the state possesses dense reservoirs of traditional knowledge. Simultaneously, Kerala has actively pursued GI registrations and participated in TK documentation initiatives, positioning itself at the intersection of heritage governance and development policy. Products such as Wayanad Pepper and Aranmula Kannadi exemplify attempts to formalize local knowledge within national and global intellectual property frameworks.

While existing scholarship acknowledges the legal importance of TKDL in preventing patent misappropriation, and recognizes GIs as potential tools for rural development, far less attention has been paid to how these mechanisms restructure relations of power, authority, and economic value at the community level. Who controls digitized knowledge? How are benefits from GI certification distributed? And whose epistemologies are privileged in these processes?

This article argues that TK digitization and GI governance must be understood not merely as technical or legal interventions, but as socio-technical systems embedded within postcolonial political economies. Digitization transforms living knowledge into standardized data, while GIs convert cultural practices into marketable commodities. Both processes rely on institutional intermediaries—bureaucrats, legal experts, certification bodies, and commercial actors—whose involvement often reshapes outcomes in ways that marginalize primary knowledge holders. Drawing on qualitative fieldwork conducted across three districts in Kerala, supplemented by document analysis and institutional mapping, this study examines how TK repositories and GI regimes operate in practice. By integrating perspectives from political economy, science and technology studies (STS), and epistemic justice, the article illuminates how heritage protection initiatives simultaneously produce visibility and vulnerability for traditional communities.

The central argument advanced here is that despite their protective intent, current TK and GI frameworks reproduce structural inequalities through epistemic abstraction and intermediary capture. While these systems enhance formal recognition, they frequently fail to deliver substantive empowerment. Instead,

they embed traditional knowledge within bureaucratic and market logics that prioritize extractable value over community autonomy.

Traditional Knowledge and Intellectual Property

Traditional knowledge has long challenged the epistemological and legal assumptions underpinning modern intellectual property systems. Unlike patents or copyrights, TK is typically collective, evolving, and inseparable from its cultural context (Posey & Dutfield, 1996). Its protection therefore resists individual ownership models and fixed temporal boundaries. International efforts to address this tension include the Convention on Biological Diversity (CBD) and ongoing negotiations at the World Intellectual Property Organization (WIPO). Yet implementation remains fragmented, with national governments adopting diverse strategies ranging from sui generis laws to digital documentation.

India's TKDL represents one of the most ambitious attempts to institutionalize TK protection through digitization. By translating Sanskrit, Arabic, Persian, and regional-language medicinal texts into searchable formats accessible to patent offices, TKDL has successfully challenged numerous biopiracy claims. However, scholars caution that such repositories also risk reducing complex cultural systems into extractable informational units (Agrawal, 2002). This process of "scientization" privileges codified knowledge over embodied practice, reinforcing what Shiva (2001) describes as epistemic colonialism. Traditional knowledge becomes legible to global legal regimes only after passing through bureaucratic filters shaped by Western scientific norms.

Geographical Indications and Development

Geographical Indications occupy a distinctive place within intellectual property law, linking product qualities to specific territories and cultural practices. Advocates argue that GIs can promote rural development by enabling producers to capture price premiums and preserve local identities (Rangnekar, 2004). Empirical evidence, however, presents a mixed picture. Bowen (2010) demonstrates that successful GI outcomes depend on strong producer organizations and inclusive governance. In many Global South contexts, legal complexity and certification costs exclude small producers, allowing elites and intermediaries to dominate value chains. In India, GI registrations have expanded rapidly, yet systematic assessments of community-level impacts remain scarce. Existing studies suggest that without robust institutional support, GIs risk becoming symbolic labels rather than engines of equitable development.

Epistemic Justice and Digital Infrastructures

The concept of epistemic justice foregrounds how social power shapes whose knowledge is recognized and valued (Fricker, 2007). STS scholars extend this analysis to infrastructures, showing how classification systems and metadata standards encode political assumptions (Bowker & Star, 1999). Digital knowledge repositories exemplify this dynamic. Decisions about what to document, how to categorize it, and who may access it are inherently political. As Hayden (2003) observes, when nature and culture enter public databases, they do so under institutional terms that often marginalize originating communities. Together, these literatures highlight the need to examine TK digitization and GI governance as interconnected processes of knowledge production, legal formalization, and economic restructuring.

Political Economy of Knowledge

Political economy provides a lens to analyze how knowledge becomes embedded within legal and market structures that redistribute value and authority. In capitalist systems, intangible cultural resources are increasingly commodified through intellectual property regimes. Traditional knowledge, once governed by customary norms and community stewardship, is reconstituted as legal property through institutional processes of documentation and certification. Following Harvey's concept of accumulation by dispossession, heritage governance can be understood as a form of value extraction whereby collective knowledge is incorporated into market circuits, often without commensurate returns to originating communities. The formalization of TK through repositories and GIs thus represents not merely protection, but a transformation of social relations surrounding knowledge.

This approach foregrounds intermediaries legal experts, certification agencies, marketing bodies, and bureaucratic institutions whose technical expertise enables access to IP regimes while simultaneously positioning them as gatekeepers. These actors frequently capture disproportionate economic and symbolic capital, reinforcing asymmetries between rural producers and institutional elites.

Science and Technology Studies: Socio-Technical Infrastructures(STS)

STS scholarship emphasizes that technologies are not neutral tools but socio technical assemblages shaped by political choices. Bowker and Star's work on classification systems illustrates how metadata standards embed institutional priorities while marginalizing alternative epistemologies. Traditional knowledge repositories exemplify such infrastructures. Decisions regarding taxonomy, data fields, and access protocols fundamentally shape how knowledge is represented and who may benefit from it. Digitization transforms embodied practices into standardized entries, privileging extractable information over contextual meaning.

Similarly, GI regimes operate through technical criteria—product specifications, geographical demarcations, and quality controls—that translate cultural practices into legal forms. These infrastructures mediate relationships between communities, states, and markets, producing what Latour terms networks of governance.

Epistemic Justice and Postcolonial Governance

Epistemic justice offers a normative framework for evaluating whose knowledge is recognized and whose voices are marginalized. Fricker distinguishes between testimonial injustice (credibility deficits) and hermeneutical injustice (structural gaps in interpretive resources). Both are evident in TK governance, where community knowledge must be reframed through scientific or legal idioms to gain institutional legitimacy.

Postcolonial theorists further argue that Global South knowledge systems remain subordinated within international intellectual property regimes dominated by Western epistemologies. Digitization and GI certification, while appearing inclusive, often reproduce colonial hierarchies by requiring conformity to externally defined standards.

Together, these perspectives illuminate how TK repositories and GI frameworks function as instruments of postcolonial governance simultaneously enabling recognition and reinforcing structural inequalities.

Traditional Knowledge and Geographical Indication Governance in India and Kerala

India's approach to TK protection combines defensive and promotional strategies. The TKDL serves primarily as a defensive tool, preventing patent misappropriation by establishing prior art. Simultaneously, the Biological Diversity Act and GI legislation aim to regulate access and commercial use. While these frameworks signal progressive intent, they operate largely through centralized bureaucratic structures. Community participation is limited, and benefit-sharing mechanisms remain weakly enforced.

Kerala has actively pursued GI registrations for agricultural and artisanal products while promoting Ayurvedic heritage through state-supported initiatives. Departments of agriculture, industries, and traditional medicine collaborate with universities and NGOs to document knowledge and facilitate certification. Despite this institutional density, coordination remains fragmented. Producers frequently rely on external consultants to navigate GI procedures, and TK documentation efforts rarely involve community governance over digital outputs.

GI products such as Wayanad Pepper illustrate these dynamics. Although certification has increased market visibility, farmers reported minimal price premiums and limited influence over branding decisions.

Digitizing Traditional Knowledge in Kerala: Visibility without Control

Kerala's engagement with traditional knowledge digitization is primarily concentrated in domains of Ayurveda, ethnobotany, and agricultural practices. State-supported initiatives seek to document medicinal formulations, cultivation techniques, and plant-based remedies through structured digital repositories. These efforts are framed as mechanisms for preserving heritage and preventing misappropriation. However, empirical findings reveal a more ambivalent reality.

Bureaucratic Codification of Living Knowledge

Field interviews with traditional practitioners and community elders indicate that digitization processes prioritize standardized data entry over contextual understanding. Knowledge is extracted through questionnaires and documentation templates designed by technical experts rather than community members. This results in the fragmentation of holistic practices into discrete informational units.

Several respondents expressed discomfort with how sacred or experiential dimensions of knowledge were omitted. One Ayurvedic practitioner noted:

"They take the formula, not the philosophy. What we practice is more than ingredients."

This reflects Agrawal's notion of scientization, wherein indigenous knowledge is translated into forms legible to modern institutions, stripping away cultural meaning.

Metadata schemas used in repositories further illustrate epistemic asymmetry. Categories such as "active compounds" or "therapeutic indications" mirror biomedical paradigms, marginalizing indigenous classificatory systems. Community knowledge must conform to institutional taxonomies to gain recognition.

Restricted Access and Institutional Ownership

Despite originating from local communities, digitized TK is typically controlled by state agencies or affiliated research institutions. Access protocols prioritize patent offices and academic users, while community contributors rarely receive direct access to the databases containing their knowledge. This institutional enclosure transforms communal heritage into state managed informational property. Contributors become data providers rather than rights bearing stakeholders, reinforcing testimonial injustice by denying communities authority over representations of their own knowledge. Moreover, benefit sharing arrangements remain largely symbolic. While policy documents emphasize equitable outcomes, few participants reported tangible returns from TK documentation efforts.

Geographical Indications and Intermediary Capture

Geographical Indications are promoted in Kerala as tools for protecting regional identity and enhancing rural incomes. Products such as Wayanad Pepper and Aranmula Kannadi serve as flagship examples. Yet field data reveal structural constraints that limit community empowerment.

GI registration involves extensive documentation, legal vetting, and compliance with quality specifications. Small producers lack the technical capacity to navigate these procedures independently. As a result, they depend on lawyers, consultants, and certification agencies.

These intermediaries occupy strategic positions within GI value chains. While they facilitate access to legal protection, they also capture substantial portions of economic value. Producers reported paying high consultancy fees and receiving limited guidance on post-registration marketing.

A farmer cooperative leader observed:

“The GI came, but the market did not come with it.”

This underscores the disconnect between legal recognition and economic benefit.

Where price premiums exist, they are often absorbed by traders and exporters rather than producers. In spice-producing regions, farmers reported continued vulnerability to price volatility despite GI status. Artisans similarly expressed frustration that branding decisions were made externally. Collective producer organizations showed greater success in negotiating market access, suggesting that institutional design plays a critical role in determining outcomes. However, such cooperatives remain exceptions rather than the norm. These patterns reflect intermediary capture, whereby actors with legal and commercial expertise appropriate the symbolic and material value generated by GI certification.

The empirical findings illuminate how TK digitization and GI governance function as intertwined mechanisms of heritage commodification. Digitization converts cultural practices into bureaucratic data, while GIs translate territorial identity into marketable brands. Both processes depend on institutional mediation, which shapes who benefits. By entering digital repositories and GI registers, traditional knowledge becomes legible to law and markets. This visibility enables protection against misappropriation but simultaneously facilitates commodification. Heritage is reframed as economic asset, subject to regulatory and commercial logics. Such transformations resonate with political economy critiques of

accumulation by dispossession, wherein collective resources are incorporated into capitalist circuits under unequal terms.

Persistent Epistemic Asymmetries

Despite participatory rhetoric, TK governance reproduces epistemic hierarchies. Scientific and legal frameworks dominate classification, marginalizing indigenous ways of knowing. Communities must translate their knowledge into externally defined categories to gain institutional recognition, exemplifying hermeneutical injustice. Digital infrastructures further entrench these asymmetries by embedding institutional priorities within metadata standards and access controls.

Kerala's TK and GI initiatives operate within broader postcolonial governance structures shaped by global IP regimes. While framed as developmental tools, they often replicate colonial patterns of extraction, where value flows upward through bureaucratic and commercial networks. Yet the findings also reveal spaces of possibility. Community cooperatives and participatory documentation models demonstrate potential pathways toward more equitable governance, highlighting the importance of institutional design.

Policy Implications: Toward Equitable Knowledge Governance

The findings of this study underscore the need to rethink traditional knowledge digitization and GI governance beyond technocratic frameworks. While existing mechanisms provide legal recognition, they fall short in delivering epistemic and economic justice. The following policy recommendations aim to re-center communities within knowledge governance systems.

Community-Controlled Metadata and Digital Sovereignty

Traditional knowledge repositories should adopt participatory metadata standards that reflect indigenous classificatory systems alongside scientific taxonomies. Communities must be involved in designing data categories and determining access protocols. Establishing community governance boards for TK repositories would ensure accountability and cultural sensitivity.

Digital sovereignty principles granting communities ownership over digital representations of their knowledge should replace extractive documentation models. Access logs and transparent usage records must be publicly available to prevent unauthorized exploitation.

GI governance structures must move beyond symbolic inclusion toward meaningful producer participation. Legal aid clinics and technical support units should be institutionalized to assist small producers with registration and compliance. Producer cooperatives should be recognized as primary decision-making bodies in branding and marketing strategies.

Mandatory benefit-sharing clauses, modeled on biodiversity access frameworks, could ensure that economic gains flow back to knowledge holders. Periodic social audits of GI schemes would help identify intermediary capture and promote accountability. Heritage protection must be embedded within broader rural development strategies. Investment in local processing infrastructure, market access platforms, and capacity-building programs is essential to translate legal recognition into livelihood enhancement.

Educational initiatives should promote intergenerational knowledge transmission, ensuring that digitization does not substitute for living traditions.

2. Conclusion

This article has examined the political economy of traditional knowledge digitization and geographical indication governance in Kerala, situating these processes within broader debates on intellectual property, development, and epistemic justice. By analyzing TK repositories and GI regimes as socio-technical systems, the study reveals how heritage protection initiatives simultaneously produce recognition and marginalization.

While digitization enhances legal visibility, it often abstracts knowledge from its cultural context, reinforcing epistemic hierarchies. Similarly, GI certification, though promising in principle, frequently generates uneven economic outcomes due to intermediary capture and institutional complexity. Together, these mechanisms transform collective heritage into commodified assets embedded within bureaucratic and market logics. Yet the analysis also identifies pathways toward more equitable governance. Community-centered metadata practices, participatory GI institutions, and enforceable benefit-sharing mechanisms offer opportunities to realign heritage protection with social justice. Kerala's experience illustrates both the risks and possibilities inherent in Global South knowledge governance.

Ultimately, safeguarding traditional knowledge in the digital age requires more than technical solutions. It demands a reconfiguration of power relations, recognizing communities not merely as sources of data or symbols of authenticity, but as sovereign knowledge producers. Only through such transformations can TK digitization and GI regimes fulfill their promise of cultural preservation and inclusive development.

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