INTERNATIONAL JOURNAL FOR LEGAL RESEARCH AND ANALYSIS

Open Access, Refereed Journal Multi Disciplinary
Peer Reviewed

www.ijlra.com

ISSN: 2582-6433

DISCLAIMER

ISSN: 2582-6433

ABOUT US

The *International Journal for Legal Research & Analysis (IJLRA)* (ISSN: 2582-6433) is a peer-reviewed, academic, online journal published on a monthly basis. The journal aims to provide a comprehensive and interactive platform for the publication of original and high-quality legal research.

IJLRA publishes Short Articles, Long Articles, Research Papers, Case Comments, Book Reviews, Essays, and interdisciplinary studies in the field of law and allied disciplines. The journal seeks to promote critical analysis and informed discourse on contemporary legal, social, and policy issues.

The primary objective of IJLRA is to enhance academic engagement and scholarly dialogue among law students, researchers, academicians, legal professionals, and members of the Bar and Bench. The journal endeavours to establish itself as a credible and widely cited academic publication through the publication of original, well-researched, and analytically sound contributions.

IJLRA welcomes submissions from all branches of law, provided the work is original, unpublished, and submitted in accordance with the prescribed submission guidelines. All manuscripts are subject to a rigorous peer-review process to ensure academic quality, originality, and relevance.

Through its publications, the *International Journal for Legal Research & Analysis* aspires to contribute meaningfully to legal scholarship and the development of law as an instrument of justice and social progress.

ISSN: 2582-6433

PUBLICATION ETHICS, COPYRIGHT & AUTHOR RESPONSIBILITY STATEMENT

The *International Journal for Legal Research and Analysis (IJLRA)* is committed to upholding the highest standards of publication ethics and academic integrity. All manuscripts submitted to the journal must be original, unpublished, and free from plagiarism, data fabrication, falsification, or any form of unethical research or publication practice. Authors are solely responsible for the accuracy, originality, legality, and ethical compliance of their work and must ensure that all sources are properly cited and that necessary permissions for any third-party copyrighted material have been duly obtained prior to submission. Copyright in all published articles vests with IJLRA, unless otherwise expressly stated, and authors grant the journal the irrevocable right to publish, reproduce, distribute, and archive their work in print and electronic formats. The views and opinions expressed in the articles are those of the authors alone and do not reflect the views of the Editors, Editorial Board, Reviewers, or Publisher. IJLRA shall not be liable for any loss, damage, claim, or legal consequence arising from the use, reliance upon, or interpretation of the content published. By submitting a manuscript, the author(s) agree to fully indemnify and hold harmless the journal, its Editor-in-Chief, Editors, Editorial Board, Reviewers, Advisors, Publisher, and Management against any claims, liabilities, or legal proceedings arising out of plagiarism, copyright infringement, defamation, breach of confidentiality, or violation of third-party rights. The journal reserves the absolute right to reject, withdraw, retract, or remove any manuscript or published article in case of ethical or legal violations, without incurring any liability.

ISSN: 2582-6433

INTEGRATING TRADITIONAL KNOWLEDGE AND BIODIVERSITY CONSERVATION: A STUDY ON THE INTERLINKAGES BETWEEN INTELLECTUAL PROPERTY RIGHTS AND SUSTAINABLE DEVELOPMENT

AUTHORED BY - DR. SHIV KUMAR KURREY[1] & HIMANSHU VERMA[2]

Abstract

Traditional knowledge plays a vital role in conserving biodiversity and sustaining rural livelihoods, particularly in regions like Bastar, Chhattisgarh, where tribal communities such as the Gond, Muria, Maria, Halba, and Bhatra have long relied on nature-based practices. These indigenous systems embody deep ecological understanding, community cooperation, and sustainable use of resources. Yet, globalization, commercialization, and inadequate legal protection have placed this knowledge at risk. This study examines the intersection of traditional knowledge, intellectual property rights (IPRs), and biodiversity conservation, highlighting how legal frameworks can be better aligned with indigenous worldviews. The research highlights gaps in implementation and community awareness, drawing on existing international instruments, including the Convention on Biological Diversity (CBD), the Nagoya Protocol, and the TRIPS Agreement. India's Biological Diversity Act (2002) is discussed as a progressive yet underutilized tool for protecting TK through Biodiversity Management Committees and People's Biodiversity Registers. The study further identifies the challenges faced by tribal communities in accessing legal safeguards, benefit-sharing mechanisms, and recognition for their contributions to sustainable development. It calls for participatory approaches that strengthen local institutions, improve awareness, and integrate traditional ecological knowledge into policy and education.

Keywords: Traditional Knowledge; Biodiversity Conservation; Intellectual Property Rights; Sustainable Development; Bastar; Indigenous Communities.

[1] Assistant Professor, Govt. J. Yoganandam Chhatisgarh College, Raipur, Chhattisgarh
[2] **Assistant Professor, Government Naveen College Nawagaon, Sector 28, Nava Raipur, Raipur**.

ISSN: 2582-6433

1. INTRODUCTION

Traditional Knowledge (TK) refers to the collective wisdom, skills, and practices that indigenous and local communities have developed and passed down through generations. It is deeply connected to nature and guides sustainable ways of living. Examples include traditional crop rotation methods, herbal medicine, and water conservation systems such as the Dong Bund irrigation technique in India. These practices not only help protect the environment but also preserve cultural identity and heritage. TK plays a key role in conserving biodiversity. Indigenous communities, who are the main holders of this knowledge, often live in areas rich in plant and animal life. Their sustainable ways of using natural resources help maintain ecological balance and make ecosystems more resilient to environmental changes. As recognized by the Convention on Biological Diversity (CBD, 1992), TK is vital for conserving and sustainably using biodiversity. However, globalization, commercialization, and the breakdown of knowledge transfer between generations pose a threat to its survival.

Biodiversity refers to the variety of life at the genetic, species, and ecosystem levels, and is essential for human well-being. It supports food security, climate regulation, and disease prevention, all of which are central to achieving the United Nations Sustainable Development Goals (SDGs). However, it faces severe threats from habitat loss, pollution, overuse of resources, and climate change. The Brundtland Commission (1987) defines sustainable development as meeting present needs without harming the ability of future generations to meet theirs. Integrating biodiversity conservation within sustainable development is so crucial. Traditional Knowledge systems offer valuable, eco-friendly alternatives to conventional development models. The relationship between Intellectual Property Rights (IPRs) and TK has become an essential topic in legal and policy discussions. While IPRs grant individual ownership to encourage innovation, TK challenges this approach because it is community-based, collectively owned, and context-specific. Its communal and intergenerational nature resists commercialization under standard IP systems.

Efforts to protect TK through IPR have increased in recent years. Legal tools such as patents, Geographical Indications (GIs), and trademarks are being adapted to acknowledge that TK belongs collectively to communities. For example, India's registration of GIs for turmeric and basmati rice helps protect not only the economic interests of local producers but also their cultural identity. However, existing IPR systems often fail to capture the unique nature of TK, leading to the creation of sui generis (special) laws explicitly designed for it. The interaction

ISSN: 2582-6433

between TK, IPRs, and biodiversity conservation remains a complex issue. A major problem is biopiracy, the unauthorized use or patenting of innovations derived from TK without the consent of indigenous communities. Well-known examples include the neem and turmeric patent cases (Shiva, 1997), which highlighted the lack of effective legal safeguards and the resulting unfair advantages for corporations. Another challenge lies in the difference between TK's non-commercial, community-based nature and the market-driven approach of IPRs. While TK is rooted in cultural traditions and daily life, commercialization risks devaluing its spiritual and cultural meaning. Also, inconsistencies between international and national laws often leave TK holders vulnerable to exploitation by companies seeking profit from traditional resources and knowledge.

2. RESEARCH METHODOLOGY

This study employs a multidisciplinary and qualitative approach to investigate the relationship between intellectual property (IP) rights, biodiversity conservation, and traditional knowledge. The research is based on an extensive review of both primary and secondary sources, including international treaties, national laws, case studies, and academic publications. It follows a doctrinal legal analysis method to examine global and national regulations related to TK protection, highlighting their strengths and gaps. Case studies from India and other countries are used to understand key issues such as biopiracy and to identify successful benefit-sharing models that support local communities. Although the study does not include empirical fieldwork, it incorporates perspectives from stakeholders, such as local communities and policymakers, to provide practical insights. A comparative analysis is also carried out to evaluate different legal frameworks and implementation strategies across nations, identifying best practices for policy improvement. By combining these approaches, the study offers policy recommendations aimed at harmonizing IP rights with biodiversity conservation and the United Nations SDGs. This integrated methodology ensures a comprehensive understanding of the relationship between TK and biodiversity while promoting fair and sustainable management practices.

3. TRADITIONAL KNOWLEDGE AND BIODIVERSITY CONSERVATION

TK and biodiversity conservation are deeply connected but face many complex challenges. One of the most significant problems is the lack of a uniform global legal framework to protect the rights of TK holders, mostly indigenous and local communities. International agreements like the CBD (1992) and its Nagoya Protocol (2010) promote fair and equitable benefit-sharing

ISSN: 2582-6433

of TK. Still, in practice, implementation varies widely from country to country. This inconsistency has created a fragmented legal system, allowing loopholes that are often exploited by commercial entities to misuse or claim ownership over community knowledge. A major reason for this problem lies in the mismatch between TK and traditional IPR systems. TK is collective, passed down through generations, and belongs to entire communities.

In contrast, IPR systems such as patents and copyrights focus on individual ownership and time-limited protection. This difference makes it challenging to apply IPR laws to TK, especially when multiple groups share knowledge or span across regions. Because of this, many experts recommend the creation of sui generis (unique) legal systems designed explicitly for TK. Such systems could better reflect the communal and long-lasting nature of traditional knowledge. However, the primary challenge is the limited global acceptance of these models (Kothari, 1999), which hinders their effectiveness.

There are also ethical concerns about the commercialization of TK. While IPR systems are meant to reward innovation through economic incentives, turning TK into a marketable commodity risks devaluing its cultural and spiritual significance. In many cases, sacred or sensitive community knowledge has been misappropriated for profit, leaving indigenous communities without recognition or benefit. The world needs coherent international frameworks that respect the communal nature, cultural values, and long-term continuity of traditional knowledge systems to conserve biodiversity and protect TK truly.

4. ETHICAL AND LEGAL DIMENSIONS OF TK PROTECTION

Protecting TK requires an approach that respects community consent and maintains cultural integrity. The customary laws and practices of indigenous communities should be recognized within national legal systems to ensure this. This helps align legal frameworks with the values and traditions of TK holders, making them more legitimate and effective. The Access and Benefit-Sharing (ABS) system, established under the CBD (1992) and the Nagoya Protocol (2010), seeks to ensure that benefits arising from the use of genetic resources and related TK are shared fairly and equitably with the communities that own them. However, challenges persist in implementing these mechanisms.

A major issue is the power imbalance between local communities and large multinational corporations. Indigenous groups often lack the legal and technical expertise needed for fair

ISSN: 2582-6433

negotiation, leading to agreements that do not truly benefit them. To solve this, TK holders need institutional support and empowerment (Bhat, 2013). In India, for example, Biodiversity Management Committees (BMCs) under the Biological Diversity Act, 2002, are meant to ensure community participation in ABS processes. However, these committees can only function effectively if they receive adequate funding, training, and the necessary legal authority. Without such support, ABS systems may unintentionally deepen existing inequalities rather than reduce them.

Another major challenge lies in the weak enforcement of TK protection laws. Even when legal provisions exist, they are often poorly implemented. The unauthorized patenting of neem and turmeric is a clear example of how inadequate enforcement allows misuse of TK (Gadgil, 1991). The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), part of the World Trade Organization (WTO) framework, also affects TK protection. TRIPS sets minimum global standards for IP laws, including:

- Requiring developing countries to align their IP laws with those of industrialized nations.
- Expanding patent coverage to include all fields of technology, including certain life forms that were previously excluded.
- Allowing plant variety protection through patents, sui generis systems, or a combination of both.

While TRIPS promotes uniform IP standards, it often conflicts with the community-based and non-commercial nature of TK, highlighting the need for balanced global policies that protect both innovation and indigenous rights.

5. GLOBAL AND NATIONAL RESPONSES TO TK PROTECTION

In response to international treaties, several countries, including Costa Rica, India, Mexico, Peru, and the Philippines, have developed new laws and policies to balance IPRs with biodiversity conservation. To effectively protect TK and genetic resources, there is a need for international cooperation and monitoring systems that can trace how TK and biological resources are used. One major initiative in this area is India's Traditional Knowledge Digital Library (TKDL) (CSIR, 2002), which serves as a database documenting traditional practices, remedies, and innovations. Such databases help prevent wrongful patent claims by proving that specific knowledge already exists. However, these databases alone are insufficient. They must

ISSN: 2582-6433

be supported by policies ensuring that TK holders receive fair benefits whenever their knowledge is used commercially (Ghosh, 2006).

The World Intellectual Property Organization (WIPO) introduced the concept of Intellectual Property Asset Management (IPAM) (2002) to use IP tools for conservation and sustainable economic development strategically. IPAM can help communities organize their collective knowledge as a shared asset, improving their bargaining power in Access and Benefit-Sharing (ABS) agreements. However, this approach must be implemented carefully to avoid turning TK into a mere commodity or undermining its cultural value. According to Khor (2002), IPAM strategies should ensure fair benefit distribution, transparent decision-making, and active community participation.

Protecting TK also raises the issue of intergenerational equity, as indigenous communities act as trustees of this knowledge for future generations. Therefore, the legal framework should provide long-term or indefinite protection, reflecting the ongoing nature of TK. Sui generis systems can provide such enduring safeguards and should include community participation in development projects that enhance TK sustainability (May, 2006). However, globalization and digital technology have added new challenges. While the digital documentation of TK increases visibility and access, it also raises the risk of misuse or unauthorized sharing. As a result, digital databases must adhere to strict ethical and legal protocols, ensuring the consent of custodians and compliance with international norms. Cross-border cooperation is also essential, especially where TK protection laws are weak or absent.

Ultimately, the relationship between TK, biodiversity, and IPRs reflects a broader tension between economic interests, cultural preservation, and ecological sustainability (Ostrom, 1990). To address this, a shift is needed from a market-centered approach to a holistic framework that values the intrinsic cultural and ecological importance of TK. Such systems should empower indigenous communities, align legal protection with equity and sustainability, and encourage the participation of governments, international organizations, corporations, and local people in creating and enforcing fair policies (Mishra, 2024). Only through this collaborative and respectful approach can TK be preserved and used responsibly for global biodiversity conservation.

ISSN: 2582-6433

6. INTERSECTION OF TRADITIONAL KNOWLEDGE AND INTELLECTUAL PROPERTY RIGHTS

For centuries, human societies have relied on biodiversity for food, medicine, and cultural traditions, with knowledge passed down collectively through generations. Indigenous communities and traditional farmers developed diverse crop varieties and herbal medicines through shared experience rather than individual ownership (Allison, 2023). However, the Industrial Revolution and globalization altered this relationship. Natural resources, once considered part of humanity's common heritage, became commercial commodities, leading to disputes over ownership and rights. IPRs, originally designed to protect inventions and mechanical innovations, began extending to biological materials in the 20th century.

One early example was the U.S. Plant Patent Act of 1930, which allowed patents for new plant varieties. Later, the creation of the Union for the Protection of New Varieties of Plants (UPOV) in 1961 strengthened the rights of plant breeders. A major turning point came in 1980, when the U.S. Supreme Court's Diamond v. Chakrabarty case permitted the patenting of genetically modified microorganisms, paving the way for broader claims over genetic resources (Amani, 2024). With globalization, the TRIPS Agreement (1994) under the World Trade Organization (WTO) required all member countries to adopt strong IPR laws, including those covering biological innovations. At the same time, growing concerns over biopiracy led to the signing of the CBD in 1992. The CBD recognized each nation's sovereign rights over its biodiversity and emphasized the need for fair benefit-sharing with local and indigenous communities (Dutfield, 2000).

The ongoing tension between TRIPS and CBD highlights the difficulty of balancing commercial interests with ethical and ecological responsibilities. Well-known cases, such as the patenting of turmeric, neem, and basmati rice, have exposed how traditional knowledge can be exploited under modern patent systems. In this way, the debate over biodiversity and IPRs is not only a legal issue but also one of justice, conservation, and sustainable development (Gepts, 2004). It calls for global frameworks that respect indigenous contributions, ensure fair benefit-sharing, and promote responsible innovation.

6.1. Traditional Knowledge, IPRs, and Biodiversity Conservation

The interaction between TK, IPRs, and biodiversity conservation involves several complex challenges. One of the main issues is the absence of a harmonized legal framework that

ISSN: 2582-6433

effectively supports the interests of TK holders, mainly indigenous and local communities. International agreements such as the CBD (1992) and the Nagoya Protocol (Joseph, 2010) promote fair and equitable sharing of benefits arising from TK. However, their implementation varies widely across countries. This inconsistency has created a fragmented global legal landscape, making it difficult for communities to protect their knowledge and leading to situations where opportunistic actors exploit legal loopholes to engage in biopiracy or avoid benefit-sharing obligations.

To address these issues, coherent global frameworks are needed that respect the cultural uniqueness of TK and reflect local realities. A deeper challenge lies in the incompatibility between TK and conventional IPR systems. TK is collective, evolving over generations as a shared cultural asset (Gupta, 2002), whereas IPRs, such as patents or copyrights, are based on individual ownership and time-limited protection. This creates both conceptual and practical barriers to using IP tools for TK protection, especially when identifying legitimate rights holders across diverse regions. Furthermore, the time-limited nature of IPRs conflicts with the intergenerational continuity of TK, necessitating the development of alternative legal mechanisms, such as sui generis systems, designed explicitly for TK. While these systems can provide better protection (Kamau, 2010), they require international recognition to be truly effective, a goal that remains unfulfilled.

Another major concern is the ethical dimension of TK protection. Applying IPRs to TK can commercialize and commodify cultural heritage that holds deep spiritual and social significance for indigenous communities (Jain, 1991). Without proper safeguards, commercialization risks distorting the cultural meaning of TK and enabling the misappropriation of sacred or sensitive knowledge. So, legal systems must prioritize community consent, cultural integrity, and recognition of customary laws. Integrating community-based norms into statutory frameworks (Mooney, 1996) ensures greater legitimacy and aligns legal protection with the values and aspirations of TK holders.

6.2. Access and Benefit-Sharing Mechanisms

Access and Benefit-Sharing (ABS) mechanisms, as outlined in the CBD and the Nagoya Protocol (Joseph, 2010), aim to ensure fair and equitable sharing of benefits arising from the use of genetic resources and related TK. However, several challenges continue to hinder their effective implementation (Ncube, 2024). A major issue lies in the power imbalance between

ISSN: 2582-6433

indigenous communities and large transnational corporations. Indigenous groups often lack the legal and technical expertise needed for negotiations, which leads to agreements that are unfavorable to TK holders. To overcome this, there is a strong need for institutional support and empowerment of local communities. In India, the BMCs established under the Biological Diversity Act, 2002, represent an important effort to involve communities in ABS processes. However, these committees must be supported through adequate funding, capacity building, and legal training to function effectively. Without such support, ABS frameworks risk widening existing inequalities instead of reducing them (Posey, 1990; Posey & Dutfield, 1996).

Another significant concern is weak enforcement. Even in countries with legal systems for TK protection, implementation remains poor. Incidents such as the unauthorized patenting of neem and turmeric demonstrate how inadequate enforcement enables the misappropriation of TK. Stronger monitoring systems and international cooperation are crucial for tracking the use of genetic resources and preventing such exploitation (Rao, 2003). India's TKDL, developed by CSIR (2002), serves as a valuable database to provide evidence of prior art, preventing the wrongful grant of patents. However, databases alone are not enough. They should be complemented by proactive measures that ensure TK holders receive fair benefits whenever their knowledge is used commercially (Singh, 2000).

6.3. The Role of Intellectual Property Asset Management

The concept of Intellectual Property Asset Management (IPAM), as defined by WIPO (2002), plays a crucial role in addressing challenges related to the protection and utilization of intellectual property. IPAM refers to the strategic management of IP to achieve goals such as cultural preservation, innovation, and economic development. In the context of TK, IPAM can help manage communal knowledge as a valuable asset while ensuring that communities retain control and benefit from its use. By organizing and documenting TK-related innovations into structured IP portfolios, communities can strengthen their bargaining power in Access and Benefit-Sharing (ABS) negotiations. However, this process must be implemented carefully to prevent the commodification of TK or the erosion of its cultural and spiritual values. Effective IPAM strategies should emphasize equitable benefit distribution, transparency, and active participation of TK holders in decision-making.

From an ethical standpoint, IPAM also relates to intergenerational equity, as indigenous communities act as trustees of knowledge that must be preserved for future generations. Proper

ISSN: 2582-6433

management ensures that TK continues to serve both cultural and developmental purposes. In general, IP assets include patents, trademarks, copyrights, industrial designs, and geographical indications. Through systematic identification, valuation, and utilization of these assets, IPAM converts information into valuable organizational knowledge that contributes to wealth creation (Rose, 2003). For example, IBM effectively used IP management to earn around $1.8 billion annually in royalties from over 25,000 patents, demonstrating the economic potential of strategic IP use. IPAM is not limited to corporations; it also benefits universities, SMEs, and research institutions. Universities in the U.S. and Canada, for instance, generate significant income by licensing patented inventions. Stanford University, for example, earned $49.5 million in royalties during the 2004–2005 fiscal year from about 1,100 licensed inventions (Singh, 2000).

Developing countries are also recognizing the potential of IPAM in fostering indigenous innovation through technology transfer, joint ventures, and regional cooperation. Mergers and acquisitions often enhance the value of corporate entities by combining diverse IP assets, thereby improving their market worth. According to WIPO (2002), IPAM activities include IP assessment and planning, IP audits, strategic IP clustering, human capital development, and incentive structures to retain talent. It also supports SMEs and research organizations through capacity building and regional cooperation. Strengthening these mechanisms enhances both the economic value of IP and the cultural sustainability of traditional knowledge systems (Subramanian, 2010).

6.4. Importance of IP Audit in Effective IP Management

A key step in Intellectual Property (IP) management is conducting an IP audit, a systematic review of all intellectual assets owned, used, or acquired by an organization. The primary purpose of an IP audit is to identify existing assets, detect unused or underutilized IP, address potential risks, and develop strategies to strengthen the organization's market position. A well-known example of effective IP management is the 1995 turmeric patent case. The Council for Scientific and Industrial Research (CSIR) in India successfully challenged and revoked a U.S. patent that claimed the medicinal use of turmeric. CSIR submitted over 30 historical references in Sanskrit, Urdu, and Hindi, proving that the healing properties of turmeric were already part of India's traditional knowledge. Based on this evidence, the U.S. Patent and Trademark Office cancelled the patent for lack of novelty (Swanson, 1995).

ISSN: 2582-6433

This landmark case led to the creation of the TKDL in 2002 and the recognition of traditional knowledge within the International Patent Classification System. It also inspired major legal reforms in India, including amendments to the Patents Act of 1970 and the introduction of the Geographical Indications of Goods (Registration and Protection) Act, 1999. Similar cases, such as the Basmati rice dispute, underscore the importance of proper IP management in protecting traditional knowledge, safeguarding national interests, and raising global awareness about the value of indigenous intellectual property (Wynberg, 2009).

6.4. The Role of Legal Framework

A robust legal framework is crucial for offering sustained protection to TK, reflecting its enduring and intergenerational nature. Conventional intellectual property (IP) systems are not well-suited for this purpose due to their limited duration. In contrast, sui generis systems, which are explicitly designed for TK, can offer more flexible and indefinite protection. Also, benefit-sharing agreements should include provisions for community participation in development initiatives, helping to build future capacities for the sustainable use and transmission of TK (Agrawal, 1995).

The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) upholds the rights of indigenous communities to preserve, control, and protect their traditional knowledge, cultural heritage, and biological resources. This principle aligns with the CBD, which promotes equitable benefit-sharing and the principle of prior informed consent when accessing genetic resources. However, the ongoing tensions between the TRIPS Agreement and these frameworks highlight persistent challenges in ensuring that global IP laws respect indigenous sovereignty and cultural integrity (Zhang, 2017). With globalization and digital advancements, TK now faces new challenges and opportunities. While digital platforms can help in recognizing and preserving TK on a broader scale, they also increase the risk of misappropriation. Therefore, open-access databases must strictly adhere to ethical and legal protocols, ensuring that any use of TK occurs only with the consent of its custodians. International legal systems must also address cross-border misuse, particularly in countries where TK protections are weak or absent (Zoll, 2003).

Greater international cooperation is necessary to build a global environment that ensures fair and equitable protection of TK. The broader issues of TK, biodiversity, and IPRs reflect tensions between economic, cultural, and ecological priorities, which legal systems must

ISSN: 2582-6433

balance to create synergy rather than conflict. As a result, a shift is needed from a market-centric approach toward a holistic framework that values the intrinsic worth of traditional knowledge. Such systems should empower TK holders, strengthen biodiversity conservation, and align legal protection with principles of equity, sustainability, and cultural respect. True success depends on the active participation of all stakeholders, including indigenous communities, governments, international organizations, and private sectors, in formulating and implementing these legal and policy frameworks (Laird, 2018).

7. UNDERSTANDING THE GAP BETWEEN PROTECTION AND ACCESS OF TRADITIONAL KNOWLEDGE IN BASTAR: AN EMPIRICAL PERSPECTIVE

Bastar, located in the southern part of Chhattisgarh, is one of India's most culturally vibrant and ecologically diverse regions. It is home to several tribal communities, such as the Gond, Muria, Maria, Halba, Bhatra, Dhurwa, and Paraja, each possessing a distinct and rich repository of Traditional Ecological Knowledge (TEK). This knowledge encompasses the use of medicinal plants, agricultural practices, forest resource management, traditional healing systems, craftsmanship, and ritual-based environmental ethics. However, despite their deep connection with nature and their contribution to biodiversity conservation, these communities often remain unaware of intellectual property (IP) laws and mechanisms, such as the Biological Diversity Act (BDA), 2002, and Access and Benefit Sharing (ABS) provisions, which exist to safeguard their indigenous knowledge.

To explore this gap, an empirical study was undertaken across selected tribal villages in Bastar, including areas such as Narayanpur, Kondagaon, Bijapur, Sukma, and Dantewada. These regions were chosen due to their significant biodiversity and the ongoing prevalence of traditional practices. The study aimed to evaluate the awareness level among the tribal population regarding their rights over traditional knowledge and the existing governmental mechanisms for protection and equitable benefit sharing.

A structured questionnaire was designed, translated into Gondi and Halbi dialects for better comprehension, and administered through personal interviews. The respondents included village elders, local healers (vaidyas), forest product gatherers, and members of BMCs, wherever they were functional. A total of 120 respondents from 10 villages participated in the study. Among them, 70% were male, as many women expressed hesitation in participating in

ISSN: 2582-6433

formal interviews due to traditional norms and linguistic barriers, though informal group discussions later helped include their views.

7.1. Traditional Knowledge Systems in Bastar

The findings revealed that the tribal communities of Bastar possess a nuanced understanding of ecological balance and resource utilization. The Gond and Muria tribes, for instance, practice shifting cultivation and have developed unique soil and water management systems adapted to hilly terrains. The Halba community is renowned for its expertise in cultivating traditional rice and millet varieties that require minimal irrigation. The Dhurwa and Bhatra communities possess extensive medicinal knowledge using herbs, roots, and forest products to treat common ailments such as fever, snake bites, bone fractures, and digestive disorders.

A local healer from Tokapal village, for example, shared that his family has been treating snake bites for generations using extracts from forest plants found near the Kanger Valley National Park. He expressed pride in this inherited knowledge but was unaware of the risk of biopiracy or how external entities could patent such formulations without their consent. Similar cases were found in Lohandiguda, where women use certain tree barks and herbs to make dyes and cosmetics, which have gained interest among urban traders but are often sold without fair compensation to the community.

7.2. Gap in Awareness and Institutional Support

The survey revealed a major gap in the awareness of intellectual property protection and biodiversity-related legal provisions. Only 12% of the respondents had even heard of the Biological Diversity Act (2002), and none had a clear understanding of the Access and Benefit Sharing (ABS) mechanism. Most respondents associated forest resource use with traditional rights rather than legal entitlements. Village BMCs, which are meant to document local knowledge through People's Biodiversity Registers (PBRs), were found to be either inactive or non-existent in many areas. In regions like Darbha, local communities were unaware that the Biodiversity Board of Chhattisgarh had ever initiated documentation efforts. Elders from the Maria community expressed that government officials rarely visit for consultations or to explain the benefit-sharing framework. Instead, they mainly interact with the Forest Department, which focuses on conservation restrictions rather than recognizing traditional rights. A local elder named Manku Ram, from a village on the forest fringe near Chitrakote, recalled how villagers used to freely share seeds, herbal remedies, and craft techniques among

ISSN: 2582-6433

themselves. He remarked that the new generation shows little interest in learning these practices, preferring government jobs or migrating to cities. The younger generation's disconnect, combined with a lack of awareness programs, threatens the survival of traditional knowledge systems.

7.3. Economic and Ecological Relevance

Traditional ecological practices in Bastar have both economic and environmental dimensions. The Halba and Gond farmers cultivate indigenous millet and rice varieties that are climate-resilient and require minimal chemical inputs. Women's groups collect non-timber forest products such as tamarind, mahua, sal seeds, and herbs, which are crucial for household income. However, despite their economic value, the absence of formal protection and fair market mechanisms allows intermediaries and traders to capture most of the profit. In a focus group discussion, women from the Bhatra tribe emphasized that the collection of medicinal herbs, such as satavar and harra, has declined due to overexploitation and restrictions imposed by forest authorities. They felt that if the government or NGOs trained them in sustainable harvesting and linked them with IP-based protection systems, they could ensure both conservation and livelihood enhancement.

7.4. Community Voices and Policy Gaps

Most respondents viewed the government's biodiversity and intellectual property initiatives as distant and bureaucratic. They were unaware of the TKDL or how traditional medicinal formulations could be documented and safeguarded from misappropriation. A few members who had interacted with NGOs, such as the Chhattisgarh Van Adhikar Samiti, expressed the need for training programs and simplified awareness materials in local languages. A significant gap identified was the absence of participatory dialogue between traditional knowledge holders and the implementing agencies of biodiversity laws. The existing top-down approach often excludes community representatives in decision-making, resulting in poor adoption and limited trust.

8. KEY OBSERVATIONS AND UNDERSTANDING THE GAPS IN AWARENESS AND ACTION

8.1. Awareness of the Biological Diversity Act, 2002

The study found that only 1% of respondents were aware of the Biological Diversity Act (BDA), 2002. This shows an almost complete lack of awareness about a vital law that protects

ISSN: 2582-6433

biological resources and traditional knowledge. The Act aims to promote conservation, sustainable use, and fair benefit-sharing. However, without knowledge of its provisions, local communities cannot utilize it to safeguard their traditional knowledge or claim their rights. Among the tribal groups of Bastar, such as the Gond, Muria, Maria, Halba, and Bhatra, traditional plant-based medicine, agriculture, and forest practices are still alive; yet, most people are unaware that these fall under the legal protection of the BDA. This lack of understanding leaves the community vulnerable to external exploitation and loss of ownership over their traditional practices.

8.2. Awareness of Biodiversity and Its Importance

Shockingly, none of the respondents (100%) had a clear understanding of the term biodiversity or its importance in sustaining the environment and human life. Although the tribal population of Bastar heavily depends on forests and natural resources for their livelihood, the concept of biodiversity as a scientific or legal term is unfamiliar to them. This gap reveals that, while people possess practical ecological knowledge, they often lack formal environmental education. Without understanding biodiversity, they cannot relate their traditional knowledge to the global movement for ecological conservation or realize that their practices play a crucial role in maintaining biodiversity balance.

8.3. Interaction with Biodiversity Management Committees

None of the respondents reported any communication or engagement with BMCs. These committees are established to serve as local institutions under the Biological Diversity Act, with responsibilities that include promoting community participation, conserving biodiversity, and ensuring benefit-sharing. The absence of interaction shows either that BMCs are inactive in most parts of Bastar or that they have failed to reach the local level. For example, villagers in Darbha and Lohandiguda mentioned that they had never been consulted or informed about such committees. This raises questions about how effectively biodiversity policies are being implemented on the ground and whether decentralization has truly empowered local communities.

8.4. Awareness of the People's Biodiversity Register

No respondent had heard about the People's Biodiversity Register (PBR), a vital document meant to record local knowledge about biological resources and their uses. PBRs are essential for documenting traditional knowledge and asserting intellectual property rights in the event of

ISSN: 2582-6433

bio-piracy. In Bastar, where hundreds of medicinal plants, forest products, and traditional healing methods are still practiced, the absence of awareness about PBRs means that this vast knowledge remains undocumented and unprotected. This situation increases the risk that outside researchers or companies might exploit this knowledge without the community's consent or benefit-sharing.

9. BRIDGING THE GAPS: RECOMMENDATIONS

The findings from Bastar highlight a fundamental paradox: while the region is rich in biodiversity and traditional wisdom, it remains poor in awareness and legal empowerment. The gap between knowledge holders and policymakers not only endangers traditional practices but also undermines the goals of sustainable development and intellectual property protection. Building awareness at the grassroots level is not merely an educational exercise; it is a form of empowerment. By equipping tribal communities with the knowledge and tools to document, protect, and benefit from their traditional practices, the government can turn them from passive subjects into active stakeholders of biodiversity conservation and cultural preservation.

9.1. Strengthening the Rights of Tribal and Local Communities

Future research in Bastar should focus on creating stronger legal and institutional mechanisms that recognize and protect the rights of indigenous and local communities over their traditional knowledge and biological resources. The tribal communities of Bastar, such as the Gond, Maria, Muria, Halba, Bhatra, and Dhurwa, have preserved a vast range of ecological and medicinal knowledge for generations. However, they lack awareness and formal protection. Studies should explore how to ensure prior informed consent before utilizing traditional knowledge and how equitable benefit-sharing models can be designed under both national and international laws to benefit these communities directly.

9.2. Reforming Intellectual Property Systems for Local Relevance

The existing IPR framework under the TRIPS Agreement (Trade-Related Aspects of Intellectual Property Rights) often fails to account for community-based or orally transmitted knowledge, such as that found in the Bastar region. Research should investigate how India can adopt sui generis (unique) systems tailored for tribal contexts. Such systems should prevent exploitation of biodiversity while protecting indigenous knowledge related to forest produce, traditional healing, and eco-friendly farming practices. These reforms would enable local innovations, such as natural dye making, forest product processing, or herbal formulations, to

ISSN: 2582-6433

gain legal recognition without forcing them into commercial patent models that are incompatible with community values.

9.3. Aligning TRIPS with CBD and UNDRIP Commitments

Future studies should emphasize the need to harmonize TRIPS with the CBD and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). This would ensure that intellectual property protection does not override the principles of biodiversity conservation or the rights of indigenous peoples to self-determination. In Bastar, where tribal identity and natural resources are deeply intertwined, such harmonization would mean recognizing community ownership over natural wealth, including forests, medicinal herbs, and traditional practices, as part of their cultural sovereignty.

9.4. Exploring Alternative Protection Models for Traditional Knowledge

Instead of relying solely on Western patent systems, Bastar's traditional knowledge can be protected through community-based intellectual property models and customary law systems. Research should focus on documenting local rules and traditional governance practices related to forest use, resource sharing, and knowledge transfer. Mechanisms such as Geographical Indications can also be explored, for example, by recognizing traditional Bastar products, such as bell-metal craft (Dhokra art), bamboo work, and herbal medicines, as community-owned assets. Defensive patenting strategies can prevent outsiders from misappropriating Bastar's traditional ecological wisdom.

9.5. Ensuring Transparency and Community Participation in Decision-Making

For any biodiversity-related policy to succeed in Bastar, inclusive and transparent decision-making is essential. Tribal communities should not be passive beneficiaries but active participants in biodiversity planning, conservation, and research. Future research should explore ways to strengthen local institutions, such as BMCs and Gram Sabhas, to ensure that the voices of traditional healers, farmers, and forest dwellers are heard in policy discussions. Meaningful participation will help bridge the gap between state-level biodiversity policies and local realities.

9.6. Strengthening Legal Compliance and Enforcement Mechanisms

While global trade systems, such as the WTO, strictly enforce intellectual property rights, there are limited mechanisms to ensure compliance with biodiversity and benefit-sharing

ISSN: 2582-6433

agreements. Research in Bastar should investigate how legal commitments under the Biological Diversity Act (2002) can be made more binding and enforceable at the district and block levels. This includes setting up monitoring systems to ensure that profits from forest-based industries or research using local resources are fairly shared with the communities who are the rightful custodians of that knowledge.

9.7. Promoting Awareness and Capacity Building

A key direction for future research is the development of effective awareness programs for local communities, policymakers, and educational institutions in Bastar. Studies should evaluate the most effective ways to disseminate knowledge about biodiversity laws, the People's Biodiversity Register (PBR), and traditional knowledge rights in local languages, such as Gondi, Halbi, and Bhatri. Community-based training and workshops can empower local people to document their knowledge, negotiate fair benefit-sharing agreements, and participate confidently in biodiversity governance. Building such capacity will enable them to be self-reliant in preserving and profiting from their cultural heritage.

9.8. Building Global and Regional Alliances for Protection

Bastar's challenges are not isolated; they reflect a global struggle of indigenous communities to protect their heritage from exploitation. Future research should explore how regional collaborations (with tribal regions like Jharkhand, Odisha, and Madhya Pradesh) and global advocacy networks can be leveraged to strengthen policy frameworks. Partnerships with international organizations, NGOs, and research institutions can help Bastar's communities challenge unfair patents, promote biodiversity-based livelihoods, and bring indigenous perspectives into global environmental and trade negotiations.

The future of traditional knowledge protection in Bastar hinges on an approach that strikes a balance between cultural preservation, ecological sustainability, and economic opportunity. Future research must focus not only on legal or technical reforms but also on empowering communities to be the rightful managers of their intellectual and biological heritage. Strengthening grassroots participation, creating culturally sensitive protection models, and fostering alliances between policymakers, scholars, and local leaders will ensure that Bastar's traditional wisdom is both respected and rewarded in the modern world.

ISSN: 2582-6433

10. CONCLUSION AND RECOMMENDATIONS

TK in the Bastar region serves as the foundation for biodiversity conservation and sustainable living. The tribal communities, such as the Gond, Maria, Muria, Bhatra, Halba, and Dhurwa, have, for generations, preserved forests, protected wildlife, and maintained ecological balance through their traditional customs, rituals, and livelihood practices. Their time-tested understanding of forest resources, medicinal plants, and natural cycles is deeply rooted in cultural and spiritual values, making it an integral part of biodiversity conservation. However, in recent years, this knowledge base has been rapidly declining due to modernization, weak institutional protection, and commercial exploitation. The lack of adequate legal frameworks and ineffective implementation of existing laws has made traditional knowledge vulnerable to misuse and biopiracy, where companies and individuals exploit indigenous wisdom for profit without sharing the benefits with the original knowledge holders.

While international instruments, such as the CBD and the Nagoya Protocol, emphasize fair and equitable benefit-sharing, they often fall short when applied at the community level in regions like Bastar. Similarly, India's Biological Diversity Act (2002) provides a strong legal framework on paper, but its effectiveness depends on the active involvement of BMCs and People's Biodiversity Registers (PBRs), which remain essentially non-functional or under-resourced in tribal areas. The study emphasizes that preserving Bastar's rich biodiversity, which spans from the dense forests of Kanger Valley to the tribal medicinal practices of Narayanpur and Dantewada, requires a holistic and community-centered approach. Traditional knowledge should not merely be documented; it must be recognized as a living system that evolves through the participation of local communities.

Balancing intellectual property rights, biodiversity conservation, and the protection of traditional knowledge is both a legal and ethical challenge. In Bastar, where nature and culture coexist symbiotically, legal measures must support, rather than suppress, indigenous ways of living. Strengthening local institutions, ensuring fair benefit-sharing, and empowering tribal communities will create a model for sustainable and inclusive conservation. This approach will not only preserve the living heritage of Bastar's tribes but also make a significant contribution to the global goals of sustainability and cultural diversity. By placing traditional knowledge at the center of biodiversity policy, Bastar can emerge as a leading example of community-driven ecological governance in India.

ISSN: 2582-6433

REFERENCES

1. Agrawal, A. (1995). Indigenous and scientific knowledge: Some critical comments. *Indigenous Knowledge and Development Monitor*, 3(3), 3–6.
2. Allison-Cassin, S., Bateman, R., Bhardwaj, R. K., & Chisita, C. T. (2023). Introduction. *The Serials Librarian*, 84(5–8), 62–65.
3. Amani, B., Ncube, C. B., & Rimmer, M. (2024). Introduction: 'The people's agenda': A history of intellectual property and sustainable development. In *The Elgar companion to intellectual property and the sustainable development goals* (pp. 1–36). Edward Elgar Publishing.
4. Bhat, S. (2013). Natural resources conservation law. Eastern Book Company.
5. Chisita, C. T. (2024). The library amid an epistemic storm: Research descriptions on indigenous knowledge services. In *Evaluating indigenous African tradition for cultural reconstruction and mind decolonization* (pp. 26–44). IGI Global.
6. Convention on Biological Diversity. (1992). *Text of the convention*.
7. Dutfield, G. (2000). *Intellectual property rights, trade, and biodiversity*. Earthscan.
8. Gadgil, M., & Berkes, F. (1991). Traditional resource management systems. *Resource Management and Optimization*, 8(3), 127–141.
9. Gepts, P. (2004). Who owns biodiversity, and how should the owners be compensated? *Plant Physiology*, 134(4), 1295–1307.
10. Ghosh, P. K. (2006). Biodiversity conservation in India: A legal perspective. *Indian Journal of Environmental Law*, 7(1), 5–18.
11. Gupta, A. (2000). *Rewarding traditional knowledge and contemporary grassroots creativity.* Indian Institute of Management.
12. Gupta, A. K. (2002). Value addition to local resources and institutions. *Electronic Journal of Sustainable Development*, 1(1), 43–55.
13. International Union for the Protection of New Varieties of Plants. (1991). UPOV convention.
14. Jain, S. K. (1991). Ethnobotany and research on medicinal plants in India. In *Ethnobotany: Principles and applications* (pp. 185–203).
15. Joseph, R. K. (2010). The Nagoya Protocol on access and benefit sharing: International treaty on genetic resources comes into force. *Current Science*, 100(10), 1441–1442.
16. Kamau, E. C., Fedder, B., & Winter, G. (2010). The Nagoya Protocol on access to genetic resources and benefit sharing: What is new and what are the implications for

ISSN: 2582-6433

provider and user countries and the scientific community? *Law, Environment & Development Journal*, 6(3), 246–262.

17. Khor, M. (2002). *Intellectual property, biodiversity, and sustainable development*. Zed Books.
18. Kothari, A., & Anuradha, R. V. (1999). Biodiversity and intellectual property rights: Can the two coexist? *Journal of International Wildlife Law & Policy*, 2, 252–276.
19. Laird, S. A., & Wynberg, R. P. (2018). A fair share? Sharing the benefits of botanical knowledge. *Nature Plants*, 4(9), 605–609.
20. May, C. (2006). *The global political economy of intellectual property rights*. Routledge.
21. Ministry of Environment, Forest and Climate Change. (2002). *Biological Diversity Act, 2002*.
22. Mishra, M. P., Joshi, B., Agarwal, P., & Varshney, I. (2024). Sustainable development goals – Role of indigenous knowledge. *Educational Administration: Theory and Practice*, 30(5), 4521–4527.
23. Mooney, P. (1996). The parts of life: Agricultural biodiversity, indigenous knowledge, and the role of the third system. *Development Dialogue*, 1(96), 73–94.
24. Ncube, C. B. (2024). Access to science, technology, and innovation: Intellectual property, human rights, and sustainable development. In *The Elgar companion to intellectual property and the sustainable development goals*. Edward Elgar Publishing.
25. Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press.
26. Posey, D. A. (1990). Intellectual property rights: And just compensation for indigenous knowledge. *Anthropology Today*, 6(4), 13–16.
27. Posey, D. A., & Dutfield, G. (1996). *Beyond intellectual property: Toward traditional resource rights for indigenous peoples and local communities*. IDRC.
28. Rao, M. (2003). *Biodiversity and sustainable development: Policies and practices*. National Book Trust.
29. Rathore, S., & Rai, S. (2024). Interplay of intellectual property rights, technological innovation, and sustainable food security: A comprehensive analysis. In *E-financial strategies for advancing sustainable development: Fostering financial inclusion and alleviating poverty* (pp. 351–361). Springer Nature Switzerland.
30. Rose, C. M. (2003). Property as the keystone right? Some reflections on the IP/biodiversity interface. *Arizona Law Review*, 45, 445–470.
31. Shiva, V. (1997). *Biopiracy: The plunder of nature and knowledge*. South End Press.

ISSN: 2582-6433

32. Singh, R. B. (2000). Indigenous knowledge and sustainable development in the Indian Himalayan region. *Mountain Research and Development*, 20(2), 156–160.
33. Subramanian, S. M., & Pisupati, B. (2010). *Traditional knowledge in policy and practice: Approaches to development and human well-being*. United Nations University Press.
34. Swanson, T. (1995). The reliance of northern economies on southern biodiversity: Biodiversity as information. *Ecological Economics*, 17(1), 1–8.
35. Tobin, B. (2004). *The role of customary law in access and benefit-sharing and traditional knowledge governance: Perspectives from Andean and Pacific Island countries*. United Nations University – Institute of Advanced Studies.
36. UNDP. (2004). *Biodiversity and development: A global assessment of national biodiversity strategies and action plans*.
37. Vermeylen, S. (2007). Contextualizing 'fair' and 'equitable': The San, Hoodia, and benefit-sharing. *Local Environment*, 12(4), 423–436.
38. WIPO. (2002). *Traditional knowledge and intellectual property*. World Intellectual Property Organization.
39. World Bank. (2002). *Indigenous knowledge: Local pathways to global development*.
40. Wynberg, R., & Chennells, R. (2009). Indigenous peoples, consent, and benefit sharing: Lessons from the San–Hoodia case. *Environmental Sciences*, 6(2), 139–156.
41. Zhang, Y., & Li, Y. (2017). Traditional ecological knowledge and sustainable development. *Sustainability*, 9(2), 222.
42. Zoll, M. (2003). Intellectual property rights and bioprospecting: Policies for conserving biodiversity. *Environmental Policy and Governance*, 13(5), 367–380.