A CRITICAL ANALYSIS ON THE ETHICS OF BIOPIRACY AND ITS IMPACT ON INDIGENOUS COMMUNITIES

by

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ABSTRACT

Leaving behind is indispensable for moving forward. It mainly applies to technological developments. To promote and achieve creativity and innovation, especially in the scientific field, the complete exclusion of damage may not be possible, but sustainable development is feasible. The resources of the future are guarded by sustainable development, thereby preventing the exploitation of natural resources and the environment. Both IPR and sustainable development are interconnected as they mutually support innovation. Economic growth is aided and challenges are addressed globally. IP assists research essential for sustainable development in fields like health and agriculture. Green technology promotes the mitigation of climate change and aids in the research of renewable energy. IPR offers protection against biopiracy and protects traditional knowledge. Indigenous communities often possess measures and suggestions for sustainable development. IPR makes sure that no developing country is exploited by a developed nation that has all the means to extract monetary benefits through knowledge of the developing nations. IPR offers coverage globally over products of innovation and creativity. It also facilitates the use of those products all across the world. It aims to uphold the concept of the "greater good." IPR acknowledges and distributes technology that supports sustainable development, but it condemns biopiracy. The indigenous communities that are victims of Biopiracy are exploited and left with no credit, authority, or monetary compensation. The WIPO supports the usage of IP in the public domain, but it also protects traditional knowledge through patents, copyrights, et cetera. This paper aims to discuss the persistent discourse between the goals of intellectual property and sustainable development. It also elaborates on how the theft of traditional knowledge affects people who possess concerned cultural and spiritual identities.

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CHAPTER-1
INTRODUCTION

1.1 Background of the Study

Humankind believes that the development of civilization depends on how scientifically developed they are but real development is how mankind manages to move forward without mindlessly exploiting what they already have. Sustainable development is real success. Regular modern humans are different from indigenous people. Indigenous people would never hurt the land like the modern man. Indigenous people would always check if their way of life or something they invented damages planet Earth. The indigenous communities believe that prevention is better than cure. They often have scientific methods that do not interfere with the wellbeing of the planet. Sometimes they go through Biopiracy. Biopiracy is the unethical, unauthorized abuse of knowledge possessed by indigenous communities, especially by people or corporations that try to derive monetary benefits from their Traditional Knowledge.

Traditional knowledge is considered as an intellectual property and intellectual properties are protected by IPR. All nations are pursuing scientific advancement through all means. This scientific development is mainly motivated by monetary gain. Sometimes Biopiracy of Traditional Knowledge is committed to make financial gains. Biopiracy is unethical and it degrades the culture of the indigenous tribes. IPR protects both Biopiracy and Bioprospecting. Both IP and Traditional Knowledge seek to support sustainable development so that the environment is not exploited for the temporary benefit of man. If the environment is exhausted for the temporary desires of men, it will make the planet unlivable for future men to come. Biopiracy isn't a simple legal issue. Standard IPR systems look for individual ownership, documented invention, something new, and protection that runs out after a set time.

1.2 Historical Evolution

Long before the modern patent office, communities nurtured knowledge about plants, healing, agriculture, food, and the environment. This wisdom wasn't written down for commercial gain, it was shared, refined, and guarded by those who lived closest to the land. But the game changed as scientific research and commercial interest in biological resources grew.

Companies realized that tapping into Traditional Knowledge could unlock secrets for new drugs or products. At this point, a line emerged between fair research, bioprospecting, and outright exploitation, biopiracy.

Bioprospecting means exploring nature's diversity for potentially useful resources. Done right, it can support advances in pharmaceuticals, agriculture, and manufacturing. The problem is when companies or researchers access resources or knowledge without community permission or give nothing back. This global concern has produced new international rules. The 1992 Convention on Biological Diversity (CBD) set out ideas about caring for biodiversity, using it wisely, and making sure benefits get shared fairly. Article 8(j) of the CBD focuses specifically on the knowledge and traditions of indigenous and local communities.

The Nagoya Protocol later sharpened these rules, laying down clear guidelines for who gets access to genetic resources and how benefits are divided. Both the CBD and the Nagoya Protocol have shaped how countries approach benefit-sharing. Meanwhile, legal disputes, over Neem, Turmeric, Basmati rice, and the Hoodia plant, highlighted how easily traditional wisdom could be captured by patents, often without consent or benefit-sharing. India responded by creating the TKDL, which documents Traditional Knowledge to block unfair patents.

1.3 Review of Literature

The existing literature on biopiracy, traditional knowledge and indigenous rights demonstrates that the subject has been examined from multiple legal, ethical, environmental and intellectual property perspectives. However, the existing studies tend to concentrate on particular aspects of the problem, such as patent protection, biodiversity conservation, access and benefit-sharing, or indigenous rights. The present study seeks to examine these dimensions together in order to understand whether the existing legal framework adequately addresses the ethical and legal concerns arising from biopiracy.

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Ikechi Mgbeoji, in Global Biopiracy: Patents, Plants, and Indigenous Knowledge (2007), examines the relationship between patent systems, biological resources and indigenous knowledge. The work focuses particularly on the manner in which intellectual property systems can facilitate the appropriation of biological resources and traditional knowledge. It provides an important foundation for understanding biopiracy as an intellectual property issue. However, its principal emphasis is on patents, plants and indigenous knowledge, with comparatively less emphasis on the integration of contemporary benefit-sharing mechanisms

and emerging technological developments. The present study therefore extends the inquiry by examining biopiracy through the combined perspectives of intellectual property, biodiversity law, indigenous rights and benefit-sharing.

Shamama Afreen and Biju Paul Abraham, in Biopiracy and Protection of Traditional Knowledge: Intellectual Property Rights and Beyond (2008), examine the limitations of intellectual property protection in addressing the appropriation of traditional knowledge. Their work is significant because it recognizes that conventional intellectual property rights alone may not provide adequate protection for traditional knowledge. However, the study predates several subsequent developments in international and national legal frameworks. The present research therefore considers subsequent developments concerning access and benefit-sharing, international protection of traditional knowledge and the participation of indigenous communities.

Zinatul A. Zainol et al., in Biopiracy and States' Sovereignty over Their Biological Resources (2011), examine biopiracy primarily from the perspective of State sovereignty over biological resources. The study highlights the relationship between biological resources, national sovereignty and exploitation. While this provides an important international legal perspective, the focus on State sovereignty does not fully address the position of indigenous and local communities as holders of traditional knowledge. The present study therefore examines the issue beyond State ownership by considering community rights, participation, consent and equitable benefit-sharing.

Niyati, in The Intersection of Patent Law and Traditional Knowledge Protection in India: Creating a Hybrid Intellectual Property Model for the Digital Age (2026), examines the relationship between patent law and traditional knowledge protection in India and proposes consideration of a hybrid intellectual property model. The study is particularly relevant to the contemporary challenges posed by the digital documentation and protection of traditional knowledge. However, its primary focus is the Indian patent and traditional knowledge framework. The present research extends the inquiry by examining the broader international legal framework, indigenous rights, access and benefit-sharing, and the ethical implications of biopiracy.

1.4 Need and Importance of the Study

Why does this study matter? Commercialization puts biological resources in the spotlight, but often by creating friction between the march of innovation and the rights of communities. Sure, this knowledge is a powerhouse for drug development and scientific progress. But most

communities who hold it don't have the legal or financial muscle to fight when their wisdom gets snatched up by outsiders.

Indigenous groups might have deep reserves of knowledge, but still face big social or economic challenges. That gap, between who holds the knowledge and who profits, sits at the heart of this study. And the issue goes beyond simple patent fights. With biotechnology and genetic research now in the mix, biopiracy can't just be framed as a patent problem. The lines blur between IPR and biodiversity law. That's why it's crucial to explore how IPR can both foster science and innovation and still respect and reward the communities that have safeguarded this knowledge for generations.

1.5 Research Problem

Traditional Knowledge is not the product of one brilliant mind. It's grown out of collective experience and deeply shaped by the community's identity. Still, IPR laws are built around the idea of an individual creator or a clear-cut inventor. This causes trouble. When companies use traditional wisdom to create new products and seek patents, the system can fail. Patents depend on "novelty" and "prior art," but much of Traditional Knowledge isn't documented in ways patent offices recognize. If it can't be found in the right place, it may get patented as if it were new.

Other hurdles arise: Who owns the knowledge? Did outsiders get consent to use it? Is there any real benefit-sharing or participation by the original community? Canceling an improper patent doesn't automatically set things right or reward the true holders of the knowledge. Simply put, the core problem is whether the mix of IPR and biodiversity laws really guards the interests of Traditional Knowledge holders, while still encouraging genuine scientific progress.

1.6 Research Questions

1. How well does the current intellectual property system protect Traditional Knowledge from biopiracy?
2. What are the main shortcomings of traditional IPR systems in dealing with knowledge held collectively or passed down over generations?
3. Are international and Indian legal frameworks effective at managing access and ensuring fair benefit-sharing when it comes to biological resources?
4. Is it possible to reconcile intellectual property protection with the rights and interests of indigenous and local communities?

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1.7 Objectives of the Study

This study aims to:

1. Investigate how Traditional Knowledge, biological resources, and IPR connect and interact.
2. Explore the legal and ethical sides of biopiracy.
3. Assess how international and Indian legal frameworks support the protection of Traditional Knowledge.
4. Study real-world cases of biopiracy to spot where protection mechanisms fail.
5. Examine how access and benefit-sharing arrangements work for indigenous and local communities.

1.8 Scope and Limitations of the Study

The study's main focus is on Traditional Knowledge tied to biological resources, and how this intersects with intellectual property protection. Covered topics include biopiracy, bioprospecting, documentation of Traditional Knowledge, patent law, geographical indications, access and benefit-sharing, defensive protection measures, indigenous and local community claims, international law, and key Indian laws and case studies. Extra attention goes to cases like Neem, Turmeric, Basmati rice, and Hoodia because of their importance in this debate.

1.9 Theoretical or Conceptual Framework

Communities develop Traditional Knowledge, then intellectual property law frames how that knowledge can be protected (or not). Biopiracy happens when outsiders take or use this knowledge without proper permission or compensation. Benefit-sharing, ideally, ensures communities receive a fair share when their wisdom is put to use. This creates a running tension: innovation and profit on one hand, protection of community heritage and culture on the other.

The study also distinguishes between "defensive" and "positive" protection. Defensive measures block outsiders from getting wrongfully awarded patents; the TKDL is a good example. Positive protection grants communities real rights of control, consent, and benefit-sharing for the use of their knowledge. It's clear that stopping improper patents isn't enough; comprehensive protection requires a broader approach focused on community rights and ongoing control.

1.10 Research Methodology

This research uses a doctrinal and analytical approach, comparing law in practice. The doctrinal part covers Indian laws, international treaties, principles of IPR, and specific court or patent rulings. Key sources include statutes, conventions, case law, and official documents. Secondary sources include books, academic articles, research reports, commentary from experts, and institutional publications.

Comparative analysis comes from looking at both global and Indian legal frameworks, especially in light of case studies like Neem, Turmeric, Basmati rice, and Hoodia. These examples show how notions like novelty, prior art, geographical origin, consent, and benefit-sharing work, or fail, in reality.

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CHAPTER-2

TRADITIONAL KNOWLEDGE, BIOPIRACY AND SUSTAINABLE DEVELOPMENT

2.1 Role of Traditional Knowledge in Sustainable Development

Traditional knowledge is the compiled wisdom of all people who exist and who have existed among indigenous communities.[1] Traditional knowledge is a refined knowledge that has been sharpened by many generations. So many people strive to perfect their traditional knowledge so that it is both useful and sustainable. Scientific developments may have more negative effects because of their nature but when it is combined with traditional knowledge they can become more environment friendly. Traditional knowledge is diverse and covers a wide area of subjects. Traditional knowledge hardly focuses on commercial gain, it mainly aims to safeguard the culture and people. In recent days, mankind has turned to herbal medicines especially because of the pandemic and newer viruses. These cause the exploitation of Traditional Knowledge.[2]

Indigenous communities often go through cultural appropriation. Cultural appropriation is the use of elements or ideas belonging to one culture by another culture, especially a so-called superior culture who have the resources to benefit from the culture of the indigenous communities.[3] Traditional knowledge also includes the languages of the indigenous communities which marks the identity of the indigenous communities. Language and culture make a community and both of them are integral parts of indigenous communities. These communities are often identified by their way of life, their language and also their culture. These identities are the reason why their traditional knowledge has such a strong foundation. It is estimated that there are 476 million indigenous people in the world, which is just 6% of the world's population but 19% of the extremely poor are indigenous people.[4] Indigenous people are often prison inmates and their life expectancy is lower up to 20 years compared to non-indigenous people.[5]

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[1] Kothari, Ashish, Traditional Knowledge and Sustainable Development (2002/01/01).

[2] Gollasuri Babu, Traditional Knowledge: Definition, Scope, and Importance; Protection, Characteristics, Nature, and Types of Traditional Knowledge, SlideShare (Mar. 23, 2018), https://www.slideshare.net/gollasuribabu/traditional-knowledge-definition-scope-and-importance-protection-characteristics-nature-and-types-of-traditional-knowledge (last visited Sept,16, 2026).

[3] "Authority," Oxford Reference, https://www.oxfordreference.com/display/10.1093/oi/authority.20110803095652789 (last visited Sept. 16, 2026).

[4] World Bank, "Indigenous Peoples," World Bank, https://www.worldbank.org/en/topic/indigenouspeoples#:~:text=There%20are%20an%20estimated%20476,of%20non%2DIndigenous%20Peoples%20worldwide. (last visited Sept. 16, 2026).

[5] Amnesty International, "Indigenous Peoples," Amnesty International, https://www.amnesty.org/en/what-we-do/indigenous-peoples/ (last visited Sept,16, 2026).

2.2 Legal and Ethical Challenges in Biopiracy

Biopiracy happens when independent researchers, research organizations or corporations take biological resources without authorization, largely from less affluent countries or marginalized people.[6] The legal aspects of Biopiracy are dealt with on multiple surfaces like international laws, National laws, Indigenous laws etc., Internationally, the Convention on Biological Diversity (CBT) aims to preserve biodiversity and offers suggestions for the partition of benefits derived from genetic resources.[7] The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity is also another international agreement that aims at benefit sharing arising from the use of genetic resources in an equal and fair way.[8] In India, traditional knowledge is primarily protected by several measures. *The Biological Diversity Act, 2002* I s a significant legislative measure made by the government to preserve the biodiversity of India and this act ensures equitable share of benefits arising through the exploitation of Traditional Knowledge and biological resources. It set up the National Biodiversity Authority (NBA) at the national level and State Biodiversity Boards (SBBs) at the state level. *The Patents Act, 1970* allows denial of the patent if the innovation is founded upon traditional knowledge that belongs to a particular group of people. Traditional Knowledge Digital Libraries allow storage and access of Traditional Knowledge thereby giving acknowledgment and prevention of unauthorized use. The patent officers find it easy to check patents that are already present through traditional knowledge. *Geographical Indications of Goods (Registration and Protection) Act, 1999* facilitates the use of signs called Geographical indications to denote that a product is from a particular region of origin.[9]

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[6] Rebecca Lawrence and Keoni Kauwe, 'Biopiracy: When Indigenous Knowledge Is Patented for Profit', The Conversation (Mar. 8, 2016), https://theconversation.com/biopiracy-when-indigenous-knowledge-is-patented-for-profit-55589.

[7] CBD Conferences 2021-2022, Convention on Biological Diversity, https://www.cbd.int/conferences/2021-2022.

[8] Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, Convention on Biological Diversity, https://www.cbd.int/abs/default.shtml#:~:text=The%20Nagoya%20Protocol%20on%20Access%20to%20Genetic%20Resources%20and%20the,a%20fair%20and%20equitable%20way.

[9] Shahnaz Kaushar, Bio-Piracy in India: A Practice of Patenting Traditional Knowledge for Profit, IPR J. Mahar. Nat'l L. U. Nagpur vol. 1, issue 1, 54-61 (June 2023).

2.3 Importance of Bioprospecting towards Sustainable Development

Bioprospecting can be defined as the use of resources including plants, microorganisms, animals, etc., for commercial gain and overall improvement of society.[10] Bioprospecting aims to create a world where benefits are shared and serve the majority of the population. The goal of Bioprospecting is that the resources to only one group's gain should be used for everyone's wellbeing. For instance, if a community finds a vaccine for a deadly virus, they are morally bound to share it with the rest of the world so that everyone benefits from it. For instance, in the 1980s, two important drugs, Vinblastine and Vincristine were derived from the plant Rosy Periwinkle (Catharanthusroseus). They are used to treat Hodgkin's disease and childhood leukemia. Eli Lilly profited 100 million dollars annually from the two drugs but it was found and marketed without proper authorization from the source countries. They were not given any royalties from the profit made by Eli Lilly.[11] Another instance is the Hoodia Case.[12]

A cactus named Hoodia was patented by a British company called Phytopharm, it was originally identified by the Council for Scientific and Industrial Research in South Africa (CSIR). It was patented considering it will be a potential cure for obesity. The San, an indigenous community of Southern Africa claimed that the active ingredient in the Hoodia Plant was traditionally used by them to suppress hunger and thirst. The San people are marginalized and they suffer from extreme poverty. They claimed that they should receive a share of profits from the marketing of the derivatives of the Hoodia plant.[13]

Another instance is the Maya ISBG case (1998 -2005). The indigenous Maya people had Traditional Knowledge about herbal medicines found in their area that have healing properties. These herbal medicines would be of great help to other people in the world. So, Ethnobiologist Dr. Brent Berlin from the International Cooperative Biodiversity Group (ICBG) decided to research their region for potential herbs and medicines. Both the indigenous communities and the group agreed to work together with consent but it was later opposed as the project was found to be exploiting the indigenous community by people from the outside world. The research on the rainforest was considered to be questionable as many queries were raised against the equitable benefit sharing done by the project.[14]

[10] Victor Kuete (ed.), Medicinal Spices and Vegetables from Africa: Therapeutic Potential Against Metabolic, Inflammatory, Infectious and Systemic Diseases (Academic Press 2017).

[11] C. Karasov, Focus: Who Reaps the Benefits of Biodiversity? 109 Environ. Health Perspect. A582–A587 (2001). DOI: 10.1289/ehp.109-a582.

[12] South African Patent No. 983170. This was followed by the granting of international patents in 1998, GB2338235 and WO9846243: Pharmaceutical compositions having an appetite-suppressant activity.

[13] Stolen Knowledge: The Hoodia Case," Public Eye, https://www.publiceye.ch/de/news/detail/stolen-knowledge-the-hoodia-case.

[14] "The International Cooperative Biodiversity Groups (ICBG) Program," ResearchGate, https://www.researchgate.net/publication/242152200_The_International_Cooperative_Biodiversity_Groups_ICB

CHAPTER-3

INDIGENOUS RIGHTS, PARTICIPATION AND IPR PROTECTION

3.1 Indigenous Rights and Sovereignty

The main reason to protect indigenous rights is because their practices are in harmony with nature and it has been formed through generations of tradition and culture. Indigenous people have solutions for complex diseases, changes in climate and preservation of biodiversity. Traditional medicinal plants and knowledge of their healing properties are also vital to the work of these scientists and provide important leads for the development of new drugs by pharmaceutical companies. Collectively, Traditional Medicines command a global market worth approximately USD 60 billion. Biological resources and Traditional Knowledge also provide useful means for cultural expression and the assertion of local autonomy. Pharmaceutical companies often use traditional medicines to move forward in research.[15] The global market of traditional medicines is worth to be USD 60 billion.[16] These kinds of biological resources are expressions of their culture and show the sovereignty they have over their local area.[17]

The plant *Ayahuascam* in the Amazon forest has been considered sacred and used by the indigenous people for ceremonies about religion and healing. Later in 1986, Loren Miller claimed he found a new variety of *Banisteriopsis*. The company got exclusive rights to the plant and they derived psychiatric and cardio-vascular drugs. Later it was found to be not fulfilling the criteria of Novelty. So, the patent was later cancelled. Another instance is *Enola Bean's case*. Mexican farmers have been growing Mexican beans (*Phaseolus vulgaris*) for many generations. Later, Larry Proctor bought these beans and let the yellow-colored beans self-pollinate in the US. He then applied for a patent on the yellow seeds. He was granted a patent and then he sued the Mexican bean exporters for the sale of such beans in the US. This raised complications and a request for a re-examination of the patent.[18] It is significant to save indigenous rights as indigenous rights are human rights and their sovereignty over their land serves justice not only to them but also to every minority community.

G_Program.

[15] Nwabueze, R.N. Biotechnology and the Challenge of Property: Property Rights in Dead Bodies, Body Parts, and Genetic Information. 1st ed. Routledge, 2007.

[16] Timmermans, S., & Berg, M. "The Practice of Medical Technology." Sociology of Health & Illness 25 (2003): 97-114.

[17] Zinatul A. Zainol et al., Biopiracy and States' Sovereignty over Their Biological Resources, 10 Afr. J. Biotechnol. 12395-12408 (2011). DOI: 10.5897/AJB11.1059.

[18] Shamama Afreen & Biju Paul Abraham, Biopiracy and Protection of Traditional Knowledge: Intellectual Property Rights and Beyond, IIM Calcutta Working Paper Series, WPS No. 629 (Sept. 2008).

3.2 Involvement of Community in Decision Making and Preservation of Cultural Heritage

People from different voices within a community need to be involved in decision-making as by including diversity in voices even the marginalized people within their community are not suppressed. Everybody's participation is necessary for decision-making.[19] Indigenous communities often reach conclusions of decisions through consensus. They include every member of their community in decision-making including elders, women and young people. They analyze their past and use their knowledge from the past to make decisions at present. The African Commission consists of about 8 to 12 members of the indigenous communities. Only recently the indigenous communities are taking part in International decision-making processes. Indigenous people have started working with the government to represent and establish an international regime on Access and Benefit-sharing of biodiversity in Africa that belongs to the indigenous communities. The United Nations Permanent Forum on Indigenous Issues (UNPFII) governs and offers policies for the effective involvement of African Indigenous people in activities related to their biodiversity.[20]

When both Indigenous people and Local Knowledge holders are combined to make informed decisions, it helps address and avoid conflicts over biodiversity and resource management.[21] When Traditional Knowledge of the indigenous communities is involved in tourism, agriculture, fishery etc., it will prove to be improving crop health and productivity. They can promote sustainable living and conservation of biodiversity.[22] It is essential to involve the indigenous people in the decision-making of the policies that address indigenous issues. The government will have to risk a policy failure if they choose to not include the indigenous people in the policies related to their welfare.[23]

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[19] "Why Is Community Engagement Important?" Granicus Blog, https://granicus.com/blog/why-is-community-engagement-important/#:~:text=Through%20feedback%2C%20community%20engagement%20enables,between%20public%20organizations%20and%20communities.

[20] Lucy Mulenkei, Indigenous Peoples' Right to Participate in Decision-Making, presented at the International Expert Seminar on Indigenous Peoples and the Rights to Participate in Decision Making, Chiang Mai, Thailand, Jan. 20-21, 2010.

[21] Castro & Nielsen, Indigenous People and Co-management: Implications for Conflict Management, ResearchGate, https://www.researchgate.net/publication/222571796_Indigenous_people_and_co-management_Implications_for_conflict_management (2001).

[22] UN General Assembly, 72nd session, Third Committee, 38th meeting, General Assembly: General Assembly Plenary, 62nd & 63rd meetings, UN Press Release, https://press.un.org/en/2017/gashc4203.doc.htm.

[23] "Social Justice Report 2006 Information Sheet 3: Indigenous Participation in Decision-Making," Australian Human Rights Commission, https://humanrights.gov.au/our-work/projects/social-justice-report-2006-information-sheet-3-indigenous-participation-decision.

3.3 Research Ethics and Bioprospecting

Bioprospecting is the research of biodiversity for new resources that can be both beneficial to society and have commercial value. It proves useful to industries such as manufacturing, agriculture and pharmaceuticals.[24] Meanwhile, Biopiracy is the exploitation of traditional knowledge or biodiversity of indigenous people by an individual or organization that has the upper hand. However, there's this criticism of Bioprospecting in the pharmaceutical industry that they commit Biopiracy on a larger scale.[25]

Biodiversity is majorly abundant in developing countries but these countries lack the ability and capacity to do research and use it to its potential. Here, Bioprospecting comes in handy and helps the resources from one part of the world help the rest of the world. The developing countries often need the developed nations to fund the research and also require Bio prospectors from the developed countries. There is a common criticism that this research from developed nations is taking and commercializing the biodiversity that belongs to the indigenous communities. This evil procedure called Biopiracy is not less common.[26] The source countries deserve to have proper compensation and sovereignty over their biodiversity.

The International Cooperative Biodiversity Groups (ICBGs) have guidelines that are consistent with the benefit-sharing arrangements of CBD.[27] It states that the agreement on benefit sharing should always be negotiated with the local community and mandates the informed consent of the local community's members. Then, it states that the benefits arising from the resources should be used for the genetic resources and the Traditional Knowledge of the local flora and fauna under study.[28]

3.4 IPR and Diaspora/Transnational Perspectives on Biopiracy

The diaspora usually has stronger feelings towards their land and their culture is what's left of them to save. The diaspora is dispersed across various countries and they manage to maintain emotional and physical connections with their land and cultures as much as they can. From the diaspora viewpoint, Biopiracy can be considered as a Neo-colonial move. It can also be considered as a form of injustice to marginalize the marginalized indigenous diaspora even more. Since the diaspora are scattered around, they go through unauthorized use and

[24] Austral Ecol., Ecology and Bioprospecting, 36 Austral Ecol. 341–356 (May 1, 2011). Published online August 19, 2010.
[25] Mgbeoji, Ikechi. Global Biopiracy: Patents, Plants, and Indigenous Knowledge. UBC Press, 2007.
[26] Millum, Joseph. "How Should the Benefits of Bioprospecting be Shared?" Published 08 Feb. 2012.
[27] Rosenthal, J., et al. "Combining High Risk Science with Ambitious Social and Economic Goals." Pharmaceutical Biology 37, no. Supplement (1999): 7.
[28] Convention on Biological Diversity, opened for signature June 5, 1992, 1760 UNTS 79, art. 8(j).

commercialization of their biodiversity. They are not compensated since the benefit sharing among the dispersed diaspora is harder. This kind of exploitation questions the sovereignty of the indigenous people and it damages their identity, cultural heritage and respect.

IPR processes are often beyond the capacity of the indigenous communities. Their legal rights are limited by their incapacity. Companies find this convenient and include their biodiversity in the formulation of pharmaceuticals. Very often the indigenous communities are unaware that they are robbed by people and corporations in power.[29] However, IPR has protected indigenous rights multiple times. In *The Neem Patent case*, several patents were granted to multinational companies in Europe and the United States by the European Patent Office (EPO) for processes involving neem-based products, claiming novelty though neem has been used in India traditionally.[30]

In *The Turmeric Patent Case*, a patent for turmeric was given to a US-based company regarding the wound-healing properties of turmeric. This Turmeric Patent created a controversy in India as turmeric has been used traditionally in India. The Council of Scientific and Industrial Research (CSIR) and the environmental organization Research Foundation for Science, Technology, and Ecology (RFSTE), challenged the patent and in 1997 the United States Patent and Trademark Office (USPTO) revoked the patent.[31] Another instance is the *Basmati Rice Patent Case.* A US-based company that filed several patents about the ownership of Basmati Rice. Basmati rice has been traditionally cultivated and consumed in India and the patent was challenged by India. RiceTec revoked 15 of 20 claims they made.[32]

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[29] Tedlock, B., Indigenous Heritage and Biopiracy in the Age of Intellectual Property Rights, Explore (NY) 2, no. 3 (2006): 256–259.
[30] "The Neem Patent Case," Mondaq, https://www.mondaq.com/india/patent/1286020/the-neem-patent-case.
[31] Bhowmick, A., Roy, S.D., & De, M. "A Brief Review on the Turmeric Patent Case with Its Implications on the Documentation of Traditional Knowledge." NDC E-BIOS, Volume 1, pp. 83-88 (2021). ISSN: 2583-6447.
[32] Mukherjee, Utsav. "A Study of the Basmati Case (India-US Basmati Rice Dispute): The Geographical Indication Perspective." National Law University Jodhpur (NLUJ), 10 June 2008.

CHAPTER-4
INTELLECTUAL PROPERTY LAW AND THE PROTECTION OF TRADITIONAL KNOWLEDGE

4.1 Traditional Knowledge and the Limits of Conventional IPR

Traditional Knowledge (TK) consistently challenges the foundations of modern intellectual property law. That exposes a gap between real innovation and simply piggybacking on collective wisdom. If patent examiners don't recognize traditional use as prior art, they might grant rights that by logic never should've been up for grabs. And the original knowledge-holders? They often have no good way to step in and object. There's another sticking point with ownership. Unlike a new drug born in some lab, TK usually belongs to an entire community, not one inventor. Often, it's passed along orally, across countless generations. Modern IPR thinks in terms of named creators, fixed protection periods, and neatly documented origins. Collective, shifting, timeless wisdom just doesn't fit that mold.[33]

4.2 Patent Law and Traditional Knowledge

Patent law stands at the frontlines of biopiracy because it lets corporations convert knowledge about natural resources into enforceable property rights. Tools like the Traditional Knowledge Digital Library (TKDL) began to bridge that gap. By documenting ancient practices and sharing them with patent authorities, TKDL makes it a lot harder for people to claim "inventions" that aren't new at all. There are really two lines of defense at play. First comes defensive protection, using documentation and public databases to stop third parties from locking up widely-known community wisdom. Second is positive protection, actually giving the originating communities rights and bargaining power, maybe even financial stakes, when their knowledge leads to profitable ventures.[34]

The gap between those two is important. Stopping a bad patent doesn't pay the villagers whose knowledge helped make a billion-dollar brand. Even if courts throw out patents based on longstanding TK, there's still no system to ensure the origin community benefits when someone else uses or commercializes their ideas. So, current patent regimes only fight half the battle. They help block outright theft, but they leave bigger questions, ownership, consent, benefit-sharing, largely untouched.

[33] Niyati, The Intersection of Patent Law and Traditional Knowledge Protection in India: Creating a Hybrid Intellectual Property Model for the Digital Age (May 5, 2026).
[34] Martin Fredriksson, India's Traditional Knowledge Digital Library and the Politics of Patent Classifications, 34 Law & Critique 1 (2023), https://doi.org/10.1007/s10978-021-09299-7.

4.3 The Case for a Sui Generis Protection System

A sui generis approach doesn't just toss out everything from standard IPR law. It fills the holes, recognizing patterns conventional systems ignore: collective ownership, oral transmission, ongoing (even perpetual) vitality, the need for community consent, and the importance of spiritual as well as economic value. Above all, it puts benefit-sharing front and center.[35] The law shouldn't slam the door on all research involving biodiversity or traditional knowledge. What it must do is guarantee that communities are at the table, deciding how their knowledge is accessed and ensuring they share in any benefits that flow from it.[36]

The real argument for sui generis protection isn't that conventional IPR has no value, there's still a place for patents, GIs, copyright, and the rest. But existing tools work best as stopgaps or layers of defense. For genuine protection of traditional knowledge, especially that which is collective, cultural, and carries on through generations, there's need for something built for that purpose from the ground up.

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[35] Intepat, A Sui Generis System of IP Protection for Traditional Knowledge, https://www.intepat.com/blog/a-sui-generis-system-of-ip-protection-for-traditional-knowledge.

[36] J. Janewa OseiTutu, A Sui Generis Regime for Traditional Knowledge: The Cultural Divide in Intellectual Property Law, 15 Marq. Intell. Prop. L. Rev. 147 (2011), https://scholarship.law.marquette.edu/iplr/vol15/iss1/3.

CHAPTER-5
INTERNATIONAL LEGAL FRAMEWORK FOR TRADITIONAL KNOWLEDGE AND BENEFIT-SHARING

5.1 Convention on Biological Diversity and the Nagoya Protocol

The Convention on Biological Diversity (CBD)[37] is a major turning point here. The CBD recognizes biodiversity's value and lays out rules about how to conserve and use biological resources sustainably. Article 8(j)[38] stands out, this is where the CBD gets specific about the Traditional Knowledge, innovations, and practices of indigenous and local communities, linking their know-how to biodiversity's future. So, when people talk about the CBD, they aren't just talking about rules for conservation or commerce; there's recognition that communities keep, use, and pass down this knowledge. It's about people, not just data.

Another key aspect: the CBD confirms that nations have sovereign rights over their natural resources. That's huge, especially thinking about biopiracy, biological resources in developing countries can be worth a fortune, but those same countries often lack the money or tech to turn them into commercial products themselves. Then comes the Nagoya Protocol, which builds on these ideas. It's all about access and benefit-sharing (ABS). Under this framework, getting genetic resources isn't a free-for-all. There's a process, prior informed consent, mutually agreed terms, and, crucially, sharing any benefits from use.[39]

5.2 TRIPS and the Protection of Biological Resources

The TRIPS Agreement sets minimum IP standards for all WTO members. Its link to biopiracy is mainly through how patent rights get applied to biological inventions. Under TRIPS, patent law can grant exclusive rights to inventors who meet certain criteria. But when it comes to biological resources, patents don't always fit neatly. Much of the debate centers on Traditional Knowledge: if an "invention" draws on knowledge an indigenous group has used for generations, giving someone else monopoly rights through a patent feels entirely wrong. Patent applicants might frame something as a breakthrough, while the community sees it as part of their collective inheritance.[40]

[37] Convention on Biological Diversity art. 8(j), June 5, 1992, 1760 U.N.T.S. 79.
[38] Id.
[39] Ashish Verma et al., Access & Benefit Sharing and Biodiversity: An Overview of National and International Legal Regime, 17 Seybold Report 1842 (2022), https://doi.org/10.5281/zenodo.7213176.
[40] EVS Institute, TRIPS, Intellectual Property & Biodiversity Protection, https://evs.institute/biodiversity-conservation-and-management/trips-intellectual-property-biodiversity-protection/.

This is where the concept of "prior art" comes in. If Traditional Knowledge has been around and is publicly accessible, it should count when patent examiners check novelty. The problem? Traditional Knowledge is often oral, local, or passed down within a community, so it won't appear in patent databases.[41] That's why projects like India's Traditional Knowledge Digital Library matter, not to privatize knowledge, but to stop others from patenting what's already known.

5.3 WIPO and the Emerging International Framework

WIPO has spent years grappling with the tension between intellectual property rights and Traditional Knowledge. What's clear is that one can't simply stretch existing patent, copyright, or trademark laws to cover Traditional Knowledge without major changes. These are different beasts, ownership, control, access, commercial use, all get much more complicated.[42]

WIPO focuses on three main areas:

- genetic resources and linked Traditional Knowledge,
- Traditional Knowledge itself as a unique legal subject,
- and Traditional Cultural Expressions.[43]

5.4 Indigenous Rights under International Human Rights Law

Protecting Traditional Knowledge isn't just a technical matter for intellectual property lawyers, it's also about the fundamental rights of indigenous peoples, including their cultural rights, self-determination, and their say over what happens in their communities. For many indigenous communities, Traditional Knowledge is inseparable from culture, land, language, and identity. The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) plays a crucial role here.[44] It recognizes indigenous peoples' rights to their own identity, participation, self-determination, and relationships with their land and resources.

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[41] ScienceDirect, Prior Art, https://www.sciencedirect.com/topics/engineering/prior-art.
[42] World Intellectual Property Organization, Traditional Knowledge, https://www.wipo.int/en/web/traditional-knowledge/tk/index.
[43] World Intellectual Property Organization, Protect and Promote Your Culture: A Practical Guide to Intellectual Property for Indigenous Peoples and Local Communities (2017), https://www.wipo.int/publications/en/details.jsp?id=4688.
[44] United Nations, United Nations Declaration on the Rights of Indigenous Peoples, arts. 3, 18–19, Sept. 13, 2007, https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html.

CHAPTER-6

BIOPIRACY, CASE STUDIES, AND EMERGING CHALLENGES

6.1 Judicial and Patent Controversies on Biopiracy

It's when courts and patent offices get drawn into disputes about biological resources that the real challenges with Traditional Knowledge and intellectual property surface. Cases around the world keep circling the same issues: what counts as new, who really owns the knowledge, how it's commercialized, the rights of communities, and the promise of sharing benefits. Let's look at some key examples.

Neem Patent Controversy[45]

Neem (Azadirachta indica) has been part of daily life in India for centuries, used in medicine, farming, and homes. Yet, patents were granted in Europe and the US for new processes involving neem, as if that knowledge were groundbreaking. In reality, these uses were already common in India. Patent examiners often don't have solid access to Traditional Knowledge records. Without that, they might see something as "novel" when local communities have known it for ages. This case shows why "defensive protection" matters. The aim isn't to give someone exclusive rights over neem, but to stop outsiders from patenting knowledge that's already public in its community.

It also reminds us that intellectual property is territorial. What's traditional in India might be unrecognized by a European office. Protecting Traditional Knowledge demands ways to share that knowledge effectively across borders.

Turmeric Patent Controversy[46]

Turmeric's story is another crucial lesson. In the 1990s, a US company patented turmeric's use for wound healing. Indian groups challenged it, showing that turmeric had been used this way in India for generations. The US Patent Office revoked the patent in 1997. What stands out is how documented Traditional Knowledge, when presented as "prior art", can defeat a claim of novelty. Patent systems need better ways to access and consider evidence outside the usual scientific journals.

[45] Method for Controlling Fungi on Plants/THERMO TRILOGY CORP., Case T 0416/01, Eur. Pat. Off. Bd. App. (Mar. 8, 2005).

[46] In re Re-examination of U.S. Patent No. 5,401,504 (U.S. Patent & Trademark Off. 1997).

Basmati Rice Dispute[47]

Now, take basmati rice. Grown in the Indian subcontinent for centuries, it became the subject of patents abroad. When RiceTec, a US company, filed patents related to basmati, India challenged, leading to most of those claims being dropped. This dispute isn't just about patents. The value of basmati isn't only its genetics but its link to place and tradition. Here, "Geographical Indications" (GI) come into play, acknowledging the deep bond between a food, its origin, and its heritage.

Hoodia Case[48]

Hoodia's story is all about benefit-sharing and fairness. The San people of Southern Africa used this plant for centuries to stave off hunger. When researchers (South Africa's CSIR) and a British company (Phytopharm) commercialized products from Hoodia, the San were left out at first. Eventually, they pressed for a share of the profits. This isn't just a "novelty" issue, it's about justice.

6.2 Structural Gaps in the Existing Legal Framework

Looking across these disputes, the cracks in current systems for protecting Traditional Knowledge become obvious.

Identification of Knowledge Holders

Traditional Knowledge is rarely owned by just one person. It's often shared, handed down and expanded collectively. That's a challenge for intellectual property systems, which expect neat, individual rights-holders.

Evidentiary Difficulties

Much Traditional Knowledge lives in stories, not documents. But patent offices look for written proof. If communities haven't recorded their knowledge in ways the system recognizes, they get left out, even if the knowledge is real and widely used. The Neem and Turmeric stories remind us why turning oral knowledge into recognized evidence is vital.

[47] Basmati Rice Lines and Grains, U.S. Patent No. 5,663,484 (issued Sept. 2, 1997).
[48] Appetite Suppressant/CSIR, Case T 0543/04, Eur. Pat. Off. Bd. App. (Jan. 27, 2005).

Cross-Border Enforcement

Often, biopiracy spreads across countries. The resource might be in one nation, the knowledge held by a community there, while research and patenting happens half a world away.

Community Access to Remedies

Rights are just words unless people can actually enforce them. Communities without money or legal resources end up at a huge disadvantage against corporations with deep pockets and international reach. Changing laws is a start, but real remedies require giving communities access to justice and enforcement.

6.4 Biopiracy in Emerging Technologies

Biotechnology adds fresh twists. Modern labs don't just extract plants, they sequence DNA, analyze it on computers, and design synthetic versions. The valuable part might no longer be the resource itself, but the information drawn from it. This muddies the old lines. Researchers can digitize genetic data, share it instantly, and use it in labs far removed from where the resource grew. It's no longer clear where the value originates, or who deserves a say in how information is used. Synthetic biology complicates things more.[49]

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[49] Irene Lavergne, Biopiracy in Microbiology: Who Owns Nature's Resources?, The Microbiologist (June 16, 2026), https://www.the-microbiologist.com/opinion.

CHAPTER-7
CONCLUSION AND SUGGESTIONS

7.1 Findings of the Study

This study set out to explore how Intellectual Property Rights (IPR), Traditional Knowledge, biological resources, and biopiracy intersect, especially when it comes to protecting indigenous and local communities. It's clear that Traditional Knowledge stands apart from mainstream intellectual property, it's collective, passed down through generations, and often deeply rooted in a community's culture. Let's start with the basics: conventional IPR systems fall short when it comes to protecting Traditional Knowledge. Sure, patent law can block a patent if Traditional Knowledge shows the invention isn't actually new, but saying "no" isn't the same as granting positive rights to the communities that have safeguarded this knowledge in the first place. Ownership is complicated. Traditional Knowledge rarely has one inventor; it's shaped and refined over centuries by many hands. So, a legal system built around individual ownership can't capture the reality of how this knowledge works or who really owns it. Defensive protection is crucial, too. The Traditional Knowledge Digital Library has shown how documentation helps keep patent offices from granting rights over existing knowledge. India has taken steps to knit together patent law, biodiversity rules, and tools like geographical indications to offer better protection.

7.2 Conclusion

"Biopiracy (is) biological theft; illegal collection of indigenous plants by corporations who patent them for their own use."

-Vandana Shiva

It is evident from the Neem, Turmeric, Basmati and Hoodia patent cases that indigenous knowledge and communities are often threatened by Biopiracy under the mask of Bioprospecting. Traditional knowledge and the biological resources of the indigenous communities make way for sustainable development. Biopiracy is often overlooked as a mistake but it is a serious crime to deteriorate someone else's culture and biodiversity for personal and commercial gain. Culture makes a man and for indigenous people who value their culture more than modern men from developed countries, culture is everything they've got. They protect their culture just through their existence since indigenous people only make up a minute fraction of the overall world population. They often die of poverty, violence and illness. Their resources are beneficial to the people of the world and the resources should be

used for everyone's wellbeing but using their resources for commercial gain and not compensating the indigenous people is abominable.

A coordinated legal framework is essential. One has to weave together intellectual property, biodiversity rules, community voices, and fair benefit-sharing. Recognition of indigenous and local community interests should be built into the core of the system. The goal isn't to stand in the way of legitimate scientific research or innovation. It's to ensure that progress is never built on the backs of communities whose knowledge and resources are taken without recognition or reward.

7.3 Suggestions and Recommendations

Strengthening the Protection of Traditional Knowledge

It's time to move beyond just relying on conventional intellectual property rights to protect Traditional Knowledge. Defensive measures, documenting knowledge, remain key, but there must also be options for communities to control and authorize who uses their knowledge and how. The Traditional Knowledge Digital Library is a solid foundation. Still, it should keep growing, with careful documentation that doesn't sacrifice community control or lead to unwanted exposure.

Strengthening Prior Informed Consent and Community Participation

Decisions about access to Traditional Knowledge and biological resources must include the communities who hold that knowledge. Consent must happen before anyone uses this knowledge for business or research, and it should be real, not just a formality. Communities deserve to understand how their knowledge will be used and what could come of it. Participation isn't a box to tick; it's a right and a practical necessity for protecting cultural heritage.

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Improving Access and Benefit-Sharing Mechanisms

Benefit-sharing isn't just about paying for resources or knowledge. When companies or researchers profit from community knowledge, real mechanisms should guarantee that benefits reach the people who made that value possible. And benefits must be more than money. Think technology transfer, training, research partnerships, investment in communities, and an ongoing role in projects, not just a one-time payment.

Strengthening Patent Examination and Disclosure Mechanisms

Patent examiners need proper access to Traditional Knowledge databases and must be able to verify whether something truly counts as a new invention. If a patent application uses biological resources or Traditional Knowledge, disclosure obligations bring much-needed transparency.

Developing a Comprehensive Sui Generis Framework

It's not enough to patch over the limits in standard IPR with new rules here and there. There's a solid case for a sui generis (unique) system tailored to the needs of Traditional Knowledge, one that acknowledges collective and intergenerational ownership, community control, fair consent, benefit-sharing, and the spiritual and cultural significance of the knowledge. This doesn't mean tossing out current systems. Instead, a sui generis approach should fill gaps and work alongside patents, geographical indications, and biodiversity laws.

Strengthening International Cooperation

Biopiracy doesn't stop at borders. That's why national protections alone won't do. Real progress needs stronger international collaboration. Countries must share information, synchronize how patent office's handle Traditional Knowledge, honor benefit-sharing, and enforce rules across borders to shield communities from exploitation. Ideally, international frameworks would better unify intellectual property, biodiversity regulation, and indigenous rights, instead of letting each roam freely in its own lane.

Addressing Emerging Biotechnology

Law can't stand still as biotechnology and genetic research advance. Exploring, analyzing, and recreating genetic information raises tough questions traditional laws sometimes miss, especially when biological data, rather than material, is what's traded or sold. Going forward, the law must stretch to cover benefit-sharing when access relates to digitized or transferable genetic information, not just physical samples. It's the only way to make sure protection keeps pace with technology.

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