ALIGNING TRADITION, INNOVATION AND LEGAL FRAMEWORKS: THE KONDA REDDI TRIBE AND THE INDIAN LAUREL IN SUSTAINABLE WATER MANAGEMENT

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ABSTRACT

Traditional Ecological Knowledge (TEKs) has been applied by various indigenous tribes around the world over the last century to govern the environment in an ecologically friendly manner. The Konda Reddi Tribe of Andhra Pradesh, India, is one such tribe that utilises TEK to preserve and sustain biodiversity. As a result of living near their natural surroundings, the Konda Reddi Tribe have developed over time and has passed on to future generations methods for conserving and maintaining forest, water, etc., biodiversity. A method of preserving and maintaining biodiversity, as identified by the Konda Reddi Tribe, includes reverence for the Indian Laurel Tree (Terminalia tomentosa), which can conserve a significant amount of water and thus serve as an important resource for use during periods of drought and/or limited availability of clean drinking water.

The Indian Laurel Tree serves as a case study to demonstrate the applicability of indigenous knowledge systems to create increased ecological resilience and to assist with current conservation initiatives. Additionally, the article will discuss India's legal framework concerning the formalisation and recognition of traditional knowledge systems and determine if the current laws provide sufficient protection for indigenous peoples. These laws include the Forest Rights Act, the Biological Diversity Act, the Panchayats (Extension to Scheduled Areas) Act (PESA) and the jurisprudence regarding environmental rights under Article 21 of the Indian Constitution. Finally, the article will examine India's international obligations as outlined in the Convention on Biological Diversity (CBD), the Nagoya Protocol on Access and Benefit-Sharing, and the norms as outlined in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

Ultimately, the authors of this article advocate the creation of a comprehensive environmental law that includes all aspects of traditional knowledge systems and promotes both legal equity and cultural preservation,

while promoting the long-term health of the planet.

Keywords: Traditional Knowledge, Konda Reddi Tribe, Indian Laurel Tree, Water Conservation, Sustainable Resource Management, Environmental Governance.

1. Introduction

Environmental sustainability is now being recognised as a very complex and multi-faceted issue with solutions not solely available by way of science or technology. As such, Traditional Ecological Knowledge (TEK) provides unique and locally relevant viewpoints for both adaptive and integrated ecological governance; TEK is based upon the collective experience and knowledge of indigenous communities and their respective lived experiences and inter-generational knowledge. Although TEK has been perceived to be static or antiquated, the knowledge systems have evolved; they remain place-based, and TEK itself is inherently sustainable. However, TEK is currently being grossly underutilised and systemically marginalised from formally structured environmental policy and governance.[1]

The purpose of this article is to analyse the ecological knowledge of the Konda Reddi people of Andhra Pradesh using as an interpretive lens of how the application of Traditional Ecological Knowledge (TEK) can provide insight into current environmental law and policy. This paper will move away from simplistic notions of indigenous practices as merely cultural traditions and consider these practices as dynamic, adaptive mechanisms that respond to environmental fluctuation and increase ecological resilience. Beyond its role in maintaining ecological balance, the Indian laurel tree is also a representative of the holistic worldview where natural components are considered to be active players in the ecosystem's maintenance of equilibrium.[2] [3] [4]

The inclusion of indigenous knowledge systems (TEK) into mainstream environmental governance generates a set of critical issues that need to be examined, including:

[1] Shyna Dudeja, 'Traditional Wisdom of Indigenous Communities is Key in Conservation' (Wotr, 28 July 2020) https://thewotrblog.wordpress.com/2020/07/28/wisdom-of-indigenous-communities-is-pivotal-in-conservation/ accessed 15 June 2025.

[2] V. Subramanyam and Veerabhadrudu. B., 'Environment and Sustainable Development: A Study among the Tribes of Eastern Ghats in Andhra Pradesh' (2013) 12 (3) Nature Environment and Pollution Technology 425.

[3] Vikram Aditya and Thyagarajan Ganesh, 'Mammals of Papikonda Hills, Northern Eastern Ghats, India' (2017) 9 (10) Journal of Threatened Taxa 10823.

[4] T. Appala Naidu, 'Konda Reddi tribe's indigenous knowledge of Indian laurel tree proves resourceful' *The Hindu* (India, 30 March 2024) https://www.thehindu.com/news/national/andhra-pradesh/konda-reddi-tribes-indigenous-knowledge-of-indian-laurel-tree-proves-resourceful/article68009872.ece accessed 15 June 2025.

How does traditional knowledge become defined and incorporated into legislative language? To what extent are the rights of the Konda Reddi people as indigenous people recognised and protected by the legal structures in India? What level of latitude does India's legal structure provide for international treaties and agreements to facilitate and reconcile the interaction between customary and statutory legal regimes? These questions form the theoretical basis for this article's analysis and placing the ecosystem wisdom of the Konda Reddi community within legal, constitutional and international normative frameworks will highlight the importance of the indigenous voices being recognized and respected in decision making on environmental issues.

This article further addresses the broader scholarly discussions on biodiversity conservation and climate adaptation and advances a more inclusive, pluralistic and equitable approach to environmental governance and legal reform in India.

2. Traditional Ecological Knowledge in the Eastern Ghats

The Konda Reddi people are located in the Eastern Ghats[5], where they exist in a very high diversity of biota and a very high abundance of ecological resources. They are unique in how much they combine their ecological knowledge, cultural identity and methods of sustainable living. Recognised officially by the Government of India[6] as a "particularly vulnerable tribal group" (PVTG)[7], the Konda Reddi's have had for hundreds of years a symbiotic, reciprocal and highly supportive relationship with the riverine and terrestrial ecosystems of the hills and forests in which they live. Their methods of sustaining themselves are extremely dependent upon their connection to the physical environment, and they continue to rely heavily upon the intergenerational knowledge systems that teach them how to be able to sustainably manage their use of natural resources in a manner that emphasises ecological balance and long-term sustainability rather than destructive exploitation.

These indigenous people have a large storehouse of traditional ecological knowledge about the many aspects of managing natural resources and environmental sustainability.[8] For instance,

[5] V. Subramanyam and Veerabhadrudu. B., 'Environment and Sustainable Development: A Study among the Tribes of Eastern Ghats in Andhra Pradesh' (2013) 12 (3) Nature Environment and Pollution Technology 425.
[6] Ministry of Tribal Affairs, *Scheme of Development of Particularly Vulnerable Tribal Groups (PVTGs)* (2024) https://tribal.nic.in/DivisionsFiles/SwLPVTGs.pdf accessed 23 June 2025.
[7] AP Tribes, 'PVTG' (*Tribal Welfare Department Government of Andhra Pradesh*) https://aptribes.ap.gov.in/PVTGNote.jsp accessed 20 June 2025.
[8] V L N Rao and G V Ramana, 'Indigenous Knowledge, Conservation and Management of Natural Environments' in *Anthropology Today* (Special Issue, 2003) http://krepublishers.com/06-Special%20Volume-Journal/T-Anth-00-

their traditional knowledge includes the identification and utilisation of medicinal plants; their knowledge of how to conserve and utilise soils and waters; and their deep understanding of the connections among all components of ecosystems. Additionally, the Konda Reddi people have shown a remarkable ability to predict changes in seasons and precipitation patterns based upon their observations of phenological cycles of plants and animals, as well as upon their observations of celestial movements, a type of knowledge system that in remote, mountainous regions may provide more reliable predictions of weather than those provided by modern meteorology.[9]

One of the most powerful illustrations of the ecological wisdom of the Konda Reddi is their interaction with the Indian Laurel Tree. This species has been identified as one of the culturally important species in the Konda Reddi traditional ecological knowledge system. The Indian Laurel grows in the dry deciduous forests of the eastern ghats; the tree has demonstrated a remarkable ability to adapt to changing environmental conditions. Based on observations made over many years by the Konda Reddi people regarding their ecological surroundings, the Indian Laurel has shown itself to be a very successful method of water storage. For example, the Indian Laurel stores water in its trunk during the wet season when the Indian Laurel is growing. It does so using its thick bark and specialised tissue to store the water. When the dry season comes, the stored water is slowly released to support wildlife and reduce drought stress on the surrounding vegetation.[10]

The hydrological capabilities of the tree, based on its unique anatomy, show great promise in aiding in the conservation of water in arid and semi-arid regions. The Konda Reddi's hands-on experience of this process illustrates how indigenous ecological knowledge can assist in revealing nature-based solutions to the global environmental issues resulting from climate change and resource management.[11]

Special%20Volumes/T-Anth-SI-03-Anth-Today-Web/Anth-SI-03-11-Rao-V-L-N/Anth-SI-03-11-Rao-V-L-N-Tt.pdf accessed 23 July 2025

[9] S Salim and M Sundar Raj, 'Indigenous Traditional Ecological Knowledge of Tamil Nadu Fisher folks: to Combat the Impact of Climate and Weather Variability' (2019) 18(4) *Indian Journal of Traditional Knowledge* 781.

[10] Sonia Sali, 'The water-producing tree of Andhra' *The New Indian Express* (Chennai, 29 May 2024) https://www.newindianexpress.com/xplore/2024/May/29/the-water-producing-tree-of-andhra accessed 27 June 2025.

[11] *Ibid.*

The Konda Reddi's methods of sustainable harvesting, podu rotation agriculture, and community-based forest management demonstrate other types of subsistence that involve living together with nature. At present, there are numerous risks to the long-term survival of biodiversity worldwide due to the effects of climate change and ecological degradation. Therefore, the Konda Reddi way of living is an illustration of how humans can be ecologically resilient and environmentally responsible stewards of ecosystems.[12]

It is essential to acknowledge and protect the rights and knowledge systems of indigenous peoples, such as the Konda Reddi, to protect biodiversity and preserve cultural heritage, and to develop environmentally inclusive policies which formally incorporate indigenous wisdom into the decision-making processes of institutions of government.[13] Once these knowledge systems are formally acknowledged, protected, and supported, they have the potential to create new innovative approaches to addressing current environmental concerns and furthering the objectives of the United Nations' Sustainable Development Goals (SDG).[14]

3. Validation of Indigenous Knowledge: A Bridge Between Tradition and Science

A partnership of the Forest Department with the Konda Reddi represents an institutional path toward bringing together ethnobotanical knowledge of local people with science. This partnership serves to break away from the typical ways of extracting and/or simply acknowledging traditional knowledge (for instance, obtaining information about plants without compensating the local people). Instead, this partnership is an example of the first time that reciprocal research has taken place, where the indigenous epistemologies have been acknowledged and validated as legitimate and empirical bases for gaining environmental insight. It was by scientifically validating the Konda Reddi's ancestral knowledge of the Indian laurel tree (Kollu) that the partnership was able to validate the Konda Reddi's ancestral knowledge of the hydrologic properties of the tree and the tree's adaptive importance within

[12] K K Kodirekkala, 'External Intervention, Local Environment, and Knowledge Erosion: A Forest-Based Community of South India' (2015) *Culture, Agriculture, Food and Environment* https://doi.org/10.1111/cuag.12059 accessed 23 June 2025.
[13] Victoria Reyes-García, Álvaro Fernández-Llamazares et.al., 'Recognizing Indigenous peoples' and local communities' rights and agency in the post-2020 Biodiversity Agenda' (2022) 51 *Ambio* 84 https://doi.org/10.1007/s13280-021-01561-7 accessed 23 June 2025.
[14] Ajay Kumar et.al., 'Role of Traditional Ethnobotanical Knowledge and Indigenous Communities in Achieving Sustainable Development Goals' (2021) 13(6) *Sustainability* 3062 https://doi.org/10.3390/su13063062 accessed 27 June 2025.

the dry deciduous forest.[15]

Controlled field studies were conducted with methodologically sophisticated, controlled designs (e.g. strategically located bark incisions) to test the internal capacity of the tree to store and hold water, thus validating the indigenous knowledge base concerning the tree's role as a reservoir of water during droughts. The concurrence of observational data obtained from controlled experimentation with the indigenous assertions regarding the properties of the tree has increased the credibility of the community-based ecological knowledge; it clearly demonstrates that these insights were developed over many years of observation of the environment and the community's adaptive practices, rather than through anecdotal beliefs. Thus, the validation of the knowledge system does not simply increase our scientific understanding of how plants may be used as natural means of storing water, but it also validates the worth of indigenous knowledge systems in generating insights to understand complex ecological processes.[16]

The results of this cooperative study demonstrate great potential for the development of novel, nature-based solutions to the current environmental issues generated by climate change (drought and water shortages). Scientists, policymakers and conservationists may use the findings of this study to develop and implement sustainable, effective water management strategies that use the biologically efficient water storage capabilities of native plant species to protect ecosystem resilience against the negative effects of climate variability, drought and water shortages. Additionally, approaches similar to those described above support the broader goal of biodiversity protection and climate adaptation in areas that are ecologically vulnerable due to climate change.

This collaborative model supports the need to incorporate indigenous ecological knowledge into the mainstream scientific methods and environmental governance structures required to meet both the practical and normative demands of incorporating traditional wisdom into policy development. Incorporating traditional wisdom into policy development will improve conservation outcomes while recognising the cultural legitimacy, procedural fairness, and intergenerational justice required to achieve long-term ecological sustainability. Therefore, by

[15] T. Appala Naidu, 'Konda Reddi tribe's indigenous knowledge of Indian laurel tree proves resourceful' *The Hindu* (Rampachodavaram, 30 March 2024) https://www.thehindu.com/news/national/andhra-pradesh/konda-reddi-tribes-indigenous-knowledge-of-indian-laurel-tree-proves-resourceful/article68009872.ece accessed 27 June 2025.
[16] *Ibid.*

creating collaborative models that recognise and honour indigenous intellectual heritage, this approach provides a basis for developing inclusive and resilient environmental governance systems that will ensure ecological sustainability for future generations.[17]

4. Legal Regime for the Protection of Traditional Knowledge in India

Traditionally, the Konda Reddi have used and maintained their own Traditional Ecological Knowledge (TEK) while being able to preserve the knowledge. The TEK is made up of generations of experiences and cosmologies of the world around them and how they interact with it; therefore, it is becoming increasingly important in today's discussions about sustainable development, biodiversity conservation, and climate change resilience.[18]

The Key Legal Frameworks are as follows:

1. **The Forest (Conservation) Act, 1980**: This act is a cornerstone of forest conservation in India. The Act prohibits the unauthorised conversion of forest land to other uses and promotes the use of the forest in a sustainable manner.[19] Most importantly, the Act is aligned with the indigenous conservation methods of the Konda Reddi and indirectly recognises the traditional values of the indigenous forest stewards.[20]

2. **The Forest Rights Act, 2006**: Officially referred to as the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, this law recognises the rights of indigenous communities to forest lands and their resources. By acknowledging Community Forest Resource (CFR) rights, the Act allows indigenous peoples to administer, protect and manage their forests in a sustainable manner using their customs, knowledge systems and communal structures.[21]

3. **The Biological Diversity Act, 2002**: This law creates a comprehensive legislative structure for the conservation of biodiversity and the protection of the traditional knowledge that

[17] Nancy J. Turner, et.al, 'Well grounded: Indigenous People's knowledge, ethnobiology and sustainability' (2022) 4 (3) People and Nature https://doi.org/10.1002/pan3.10321 accessed 27 June 2025.
[18] Worrel Kumar Bain, 'Conservation of Environment through Traditional Knowledge and Wisdom with Special Reference to Beliefs and Practices in Tribal India' (2017) 5 Journal of Multidisciplinary Studies in Archaeology 224.
[19] The Forest (Conservation) Act, 1980, s 2
[20] The Forest (Conservation) Act, 1980.
[21] The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006, s 3(1)(i)

accompanies it. It facilitates the implementation of Access and Benefit Sharing (ABS) procedures that are required for compliance with India's international obligations under the Convention on Biological Diversity (CBD) and the Nagoya Protocol. ABS ensures that communities, such as the Konda Reddi, who contribute to the governance of biodiversity through their ecological knowledge, are equitably recognised and compensated.[22]

4. **PESA Act, 1996 (Panchayats (Extension to Scheduled Areas) Act)**: PESA advances decentralised and participatory forms of governance in Scheduled Areas by giving the Gram Sabhas the power to make decisions, especially regarding the management of natural resources and land use.[23] In recognising customary laws, traditional practices and the autonomy of the community, PESA creates a statutory basis for the indigenous governance of the environment.[24]

5. **The Environment (Protection) Act, 1986**: This environmental law gives the Central Government broad powers to take action for protecting the environment and controlling pollution.[25] Within its wide-ranging powers, there exists the potential to include community-based conservation practices and traditional ecological systems into the formal environmental management frameworks.[26]

6. **Constitutional Provisions**: The Indian Constitution contains several provisions that support the protection of the environment and indigenous interests:

- Article 21 guarantees the Right to Life, which has been interpreted by the courts as including the Right to a Clean, Healthy and Sustainable Environment. The Right to a Clean, Healthy and Sustainable Environment is often protected and practised by indigenous communities through traditional stewardship.[27]

- Article 48-A, as a Directive Principle of State Policy, encourages the State to protect and improve the environment and to safeguard the forests and wildlife; this article is consistent

[22] The Biological Diversity Act 2002
[23] The Provisions of the Panchayats (Extension to the Scheduled Areas) Act 1996, s 5.
[24] The Provisions of the Panchayats (Extension to the Scheduled Areas) Act 1996, s 4.
[25] The Environment (Protection) Act, 1986, s 3.
[26] *Ibid.*
[27] *Subhash Kumar v. State of Bihar,* (1991) 1 SCC 598

with the traditional conservation ethic of the Konda Reddi and other tribes.[28]

- Article 51-A (g) requires all citizens to protect and improve the natural environment and reinforces the continued relevance of indigenous ecological knowledge in discharging the duties of citizenship.

- Articles 244 and the Fifth Schedule create specific forms of governance in Scheduled Areas so that the interests of the tribes, the customary laws and the community institutions can be given serious consideration within national and state policies.

Therefore, when these legal frameworks are properly implemented, they not only provide for the cultural and ecological integrity of indigenous communities like the Konda Reddi but also position the knowledge systems of indigenous peoples, such as the Konda Reddi, as critical components of India's efforts to develop inclusive, participatory and sustainable environmental governance systems.

5. Judicial Trajectories on Indigenous Rights and Environmental Justice

The Indian judiciary is being developed as an authoritative force to protect environmental values and the rights of indigenous peoples. Through a growing body of case law, the courts are recognising the importance of indigenous peoples' traditional ecological knowledge (TEK) and their cultural heritage as key elements in the maintenance of sustainable forests and ecological management. Together, the Supreme Court of India and other high court decisions provide a legal interpretive framework that reflects an understanding of indigenous peoples' perceptions of the natural world, ecological health, and the protection of constitutional rights. The creation of this judicial precedent acknowledges indigenous peoples' roles as both custodians of biodiversity-rich ecosystems and the active stewards and caretakers of ecological health.

1. *T.N. Godavarman Thirumulpad v. Union of India (1997)*[29]

The Supreme Court expanded the definition of "forest" to include not only areas formally designated as forested but also any area that functions as a forest. The impact of this decision

[28] *T.N. Godavarman Thirumulpad v. Union of India*, (1997) 2 SCC 267
[29] AIR 1997 SC 1228

was far-reaching:

- Protection of ecologically important and communally managed forestland increased whether or not such areas were officially designated as forests.

- Tribes such as the Konda Reddi, who use community forests and sacred groves, including the sacred Indian Laurel Tree (Terminalia tomentosa), to conserve water and perform rituals, will be afforded greater protection against the commercialisation of such traditionally maintained forestlands.

- The court reinforced the legal basis that Indigenous communities are both epistemically competent and possess authoritative knowledge regarding forest governance, biodiversity management, and sustainable water collection practices.

2. *Orissa Mining Corporation v. Ministry of Environment & Forests (2013) – (Niyamgiri Judgment)i*[30]

   The Niyamgiri Judgment is a landmark decision in recognising the autonomy of Gram Sabhas under the Forest Rights Act, 2006, and their legislative authority to determine whether land should be diverted for industrial projects. The most salient aspects of the decision include:

- The validation of local self-government as a constitutionally based method of making decisions about the use of land for industrial purposes.

- The validation of the cultural, spiritual, and ecological significance of the Niyamgiri Hills to the Dongria Kondh Tribe, thus preventing the removal of the hills from tribal control for large-scale mining.

- The decision is significant for tribes like the Konda Reddi because it provides legal precedent for the legitimacy of Indigenous cosmology, cultural landscape, and forest conservation practices; therefore, providing support for the incorporation of their TEK into decision-making processes.

[30] (2013) 6 SCC 476

3. *K.M. Chinnappa v. Union of India (2002)*[31]

In this decision, the Supreme Court incorporated two key environmental principles into the law of India:

- The Precautionary Principle emphasises proactive government action to prevent environmental damage.
- Intergenerational Justice requires that governments preserve environmental assets for future generations.

Both of these principles provide a normative and legal justification for the recognition of Indigenous conservation ethic, such as those practised by the Konda Reddi in relation to their traditional sustainable practices of forest and water resource management. These principles also provide the legal basis for incorporating customary conservation knowledge into the decision-making process to ensure long-term ecological resilience.

4. *M.K. Ranjitsinh v. Union of India (2024)*[32]

In a recent and important decision, the Supreme Court recognised a "right against climate harm" under Article 21 (Right to Life). The decision holds that:

- Climate change represents a direct and actionable threat to a person's constitutional right to life and dignity.
- The State has an enforceable duty to curtail ecological destruction and promote climate justice, particularly for vulnerable and forest-dwelling Indigenous communities.

As tribes like the Konda Reddi face the immediate impacts of climate change and have developed adaptive traditional practices to deal with environmental variability, the decision provides them with the opportunity to have their ecological knowledge legally protected and utilised as a critical tool in India's efforts to build climate resiliency and preserve biodiversity. The Indian court system now accepts a rights-oriented, culturally sensitive and environmentally aware approach to indigenous and ecological justice. Not only does this represent an

[31] AIR 2003 SC 724
[32] *2024 SCC OnLine SC 570*

acceptance by the Indian court system that indigenous peoples have the right to govern and protect their own resources, but it also recognises that traditional ecological knowledge (TEK) is a necessary and valid component of contemporary environmental decision-making. As such, recognising TEK will allow the Konda Reddi people to be autonomous stewards of the environment and to participate in India's future ecological development.

6. Internal Commitments and Their Domestic Integration in the Protection of Traditional Environmental Knowledge

International legal documents are starting to acknowledge the environmental knowledge and practices of Indigenous peoples as a source of sustainable development. Global legal agreements are increasingly recognising the role of traditional ecological knowledge (TEK) in protecting biodiversity and maintaining ecosystems, particularly among indigenous people who have coexisted with nature for many generations. As the world's focus on sustainable development, natural resource management, and environmental justice continues to grow, TEK will be critical to successful international cooperation.

As a signatory to numerous international agreements, India has begun to adopt similar legal approaches to protect the rights of indigenous communities who possess traditional knowledge, such as the Konda Reddi, and has therefore strengthened the legitimacy and protection of their traditional knowledge.

1. **Convention on Biological Diversity (CBD) - Article 8(j)**

India is a party to the CBD, which recognises the critical role of indigenous and local communities in conserving biodiversity. Specifically, Article 8(j) of the CBD obligates parties to:[33]

a. Respect, preserve, and maintain the knowledge, innovations, and practices of indigenous and local communities related to the conservation and sustainable use of biological diversity;

b. Promote the wider application of the knowledge, innovations, and practices of indigenous and local communities, with their approval and involvement; and

[33] Convention on Biological Diversity, 'Introduction – Traditional Knowledge and the Convention on Biological Diversity' (CBD, 2021) https://www.cbd.int/traditional/intro.shtml accessed 24 July 2025.

c. Encourage fair and equitable sharing of the benefits arising from the utilisation of the knowledge, innovations, and practices of indigenous and local communities.

For communities such as the Konda Reddi, this article provides an important international acknowledgement of their traditional knowledge, especially in terms of forest and water management. Domestically, India has implemented these obligations through the Biological Diversity Act, 2002,[34] which operationalises the obligations of Article 8(j) by requiring the documentation of traditional knowledge and creating mechanisms for the sharing of benefits through the National Biodiversity Authority (NBA) and local Biodiversity Management Committees (BMCs).

2. Nagoya Protocol on Access and Benefit Sharing (ABS)

As a supplementary agreement to the Convention on Biological Diversity, the Nagoya Protocol further reinforces the principles of Prior Informed Consent (PIC) and Access and Benefit-Sharing (ABS).[35] Specifically, the Nagoya Protocol obligates countries to require prior informed consent for access to traditional knowledge and to ensure that any benefits arising from the use of this knowledge are shared fairly and equitably.

Domestically, India has incorporated these principles into its law through the Biological Diversity Act[36] and the creation of Biodiversity Management Committees (BMCs) at the local level.[37] These BMCs, in which tribal groups such as the Konda Reddi may participate directly, are responsible for maintaining People's Biodiversity Registers, thus recording traditional ecological knowledge for both protection and benefit-sharing.

3. United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)

Although not legally binding, the UNDRIP articulates widely-accepted international standards regarding indigenous self-governance, cultural continuity and governance. Two principles of

[34] Convention on Biological Diversity (adopted 5 June 1992, entered into force 29 December 1993) 1760 UNTS 79, art 6
[35] 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 (adopted 29 October 2010, entered into force 12 October 2014) UNTS Registration No 30619, https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf accessed 01 July 2025.
[36] Biological Diversity Act 2002, ss 6 and 21
[37] Biological Diversity Act 2002, s 41

UNDRIP are especially pertinent to the Konda Reddi context:

a. Free, Prior and Informed Consent (FPIC): requires States to obtain the free, prior and informed consent of indigenous peoples before taking actions that could impact their lands or resources;[38]

b. Cultural Integrity and Sustainability: affirms the right of indigenous peoples to preserve and develop their own institutions, spiritual traditions, languages, cultures and knowledge systems.[39]

Although India has not formally incorporated the UNDRIP into its Constitution, it reflects many of the same values domestically through various enactments, including:

i. The Schedule Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, which makes Gram Sabha consent mandatory for using forest lands, and[40]

ii. The Panchayats (Extension to Scheduled Areas) Act, 1996 (PESA), ensures community participation in decision-making processes regarding natural resource management.[41]

Both of these enactments reflect the principles of the UNDRIP by providing the opportunity for local communities, including the Konda Reddi's, to manage and protect their natural resources using traditional knowledge systems.[42]

Together, the three international instruments referenced above, the Convention on Biological Diversity (CBD), the Nagoya Protocol on Access and Benefit Sharing (ABS), and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), not only legitimise but also support the protection and application of traditional ecological knowledge (TEK). For the Konda Reddi tribe, these international instruments provide a basis for integrating their long-standing environmental stewardship into mainstream conservation policy.

By validating the indigenous knowledge systems, by promoting the protection and utilisation of them, and by translating these international treaties into local laws, India will protect the

[38] United Nations Declaration on the Rights of Indigenous Peoples, UNGA Res 61/295 (13 September 2007) UN Doc A/RES/61/295, art 19
[39] United Nations Declaration on the Rights of Indigenous Peoples, UNGA Res 61/295 (13 September 2007) UN Doc A/RES/61/295, art 11(1)
[40] The Forest Rights Act 2006 s 3(2)
[41] The Panchayats (Extension to Scheduled Areas) Act 1996 s 4
[42] United Nations Declaration on the Rights of Indigenous Peoples, UNGA Res 61/295 (13 September 2007) UN Doc A/RES/61/295, art 29.

cultural heritage and ecological wisdom of its indigenous peoples, which could promote the continued involvement of indigenous peoples in environmental sustainability. The support for this is based upon the belief that effective environmental governance should be inclusive of indigenous communities, particularly about the inclusion of indigenous peoples in the decision-making process, in an era where the global community is experiencing increasing pressure on its ecosystems resulting from a rapidly developing climate crisis and a rapidly escalating ecological crisis.

7. Bridging Customary Law and Statutory Frameworks

Indigenous cultures have been in close contact with their natural environments for thousands of years. The ways of living of these people, along with customary laws and traditional ecological practices, demonstrate a deep-rooted sustainable system. Customary laws consist of community-based water systems, the protection of "sacred" areas (forests), non-extractive uses of forest products, and the oral passing on of ecological knowledge from one generation to another. While these customary laws are not just representations of cultural heritage but also regulatory frameworks that maintain ecological balance, protect biodiversity and create social resiliency, they do not receive the same level of governmental or institutional support as do formally recognised laws. As a result, there are limited mechanisms currently in place to support them.[43]

Legal pluralism provides a possible mechanism to address this gap. Legal pluralism is the coexistence and mutual recognition of multiple systems of law within a single territorial jurisdiction.[44] The incorporation of local legal traditions into the governance of environmental issues will allow policies that are appropriate to the specific contexts in which they are implemented, are acceptable to local populations, and are environmentally sustainable. Examples of this trend in India are the Panchayats (Extension to Scheduled Areas) Act, 1996 (PESA), and the Forest Rights Act, 2006 (FRA). Both of these Acts are aimed at decentralising power and recognising the authority of Indigenous people to make decisions regarding natural resource management in areas they traditionally inhabit.

- PESA provides for the decentralisation of governance by providing Gram Sabhas in Scheduled

[43] Arun Agrawal, *Environmentality: Technologies of Government and the Making of Subjects* (Duke UP 2005).
[44] Sally Falk Moore, 'Law and Social Change: The Semi-Autonomous Social Field as an Appropriate Subject of Study' (1973) 7 *Law & Society Review* 719.

Areas the right to govern natural resources in accordance with customary laws.[45]

- FRA builds upon PESA by allowing tribes to protect, regenerate and manage forests based on traditional knowledge systems through recognition of CFRs.[46]

Although both of these progressive pieces of legislation hold great promise for supporting the effective utilisation of customary law and TEK in forest and biodiversity management, there are several barriers to successful implementation. These include a lack of capacity building and awareness at the local level, a lack of political will to decentralise decision-making, and commercial interests that conflict with collective conservation efforts. As a result, the transformative potential of legal pluralism continues to go unrealised, with statutory recognition not necessarily translating into actual empowerment or ecological justice for indigenous peoples.

Therefore, TEK must be viewed not only as a cultural artefact that is worthy of documentation, but as a living system of environmental governance. In order for this to occur, there must be a transition from tokenistic recognition to co-management models in which indigenous communities, like the Konda Reddi, are recognised as equal partners in the management of forests and biodiversity.

Potential ways to incorporate customary law into statutory environmental governance include:

- joint forest management agreements in which community values are integrated into forest plans;
- institutionalising roles for elder tribal members and knowledge keepers in environmental impact assessments;
- providing statutory protections for spiritual and cultural landscapes to prevent the extraction of natural resources and loss of ecosystem services.

If customary law is incorporated into statutory environmental governance, India may not only provide environmental justice to its indigenous peoples, but it may also develop a model of

[45] The Panchayats (Extension to Scheduled Areas) Act 1996 s 4
[46] The Forest Rights Act 2006 s 3 (1)(i)

sustainable development that is durable and locally based.

8. Significance for Sustainable Water Management

In this time of growing water shortages due to climate change, rising populations, unpredictable monsoons and rapid population growth, the Indian laurel tree has emerged as a beacon of hope in India because of its own ability to act as a natural reservoir for storing and releasing water. Because the tree stores water in the trunk during monsoon seasons and releases water at a steady rate during dry seasons, there is much potential for developing natural water retention-based water conservation methods that are both cost-effective and environmentally friendly. Research on replicating and using the Indian laurel's natural water storage capabilities could help develop natural water retention-based methods for conserving water.

Technologies inspired by the Indian laurel, including rainwater collection systems, and encouraging the planting of water-retaining trees and plants, provide simple and practicable ways to alleviate water stress in areas experiencing droughts. Because these technologies mimic nature's process of conserving water, they provide quick relief from drought conditions and will ultimately increase the long-term ecological resilience of an area. These technologies provide benefits beyond conserving soil moisture and preserving biodiversity; they also assist in sustaining rural agricultural livelihoods, which are extremely susceptible to changes in hydrologic regimes.[47]

The incorporation of the Indian laurel tree as an additional natural resource to be used in the storage of water also supports many of the larger initiatives that are being proposed in response to the growing impacts of climate change. The incorporation of these research results into sustainable water management practices will enable communities to protect the availability of water for future generations, while continuing to maintain an adequate supply of water available for use by the people living within those communities, as well as protecting the environment from the negative impacts associated with the use of water. Overall, the strategy outlined above recognises the importance of using environmentally responsible solutions to address the water challenges currently facing our society and the importance of developing a sustainable and resilient future.[48]

[47] *Ibid.*
[48] *Ibid.*

9. Conclusion

The Konda Reddi's continued reverence for the Indian laurel tree, a tree which exemplifies an adaptation of hydrologic resilience and has been used by local people to manage water in drought-sensitive environments for centuries, serves as a powerful example of how indigenous knowledge systems have the capacity to influence current trends in environmental governance. Further, the fact that these indigenous practices are often based upon community-based approaches demonstrates how they can be valuable tools in sustainably managing water. As further supported by science, the ecological reasoning underlying indigenous practices is based upon many years of experience with natural systems and is at least equal to those developed by modern scientists and provides additional value in understanding how to maintain healthy natural systems and protect biodiversity.

Therefore, this paper emphasises that there is a need for the integration of traditional ecological knowledge (TEK), empirical scientific evidence (ESE), statutory recognition, and judicial support for effective environmental governance. In addition, India's environmental legislation, and its jurisprudence (including statutory and common law) and international commitments (such as those contained in the Convention on Biological Diversity, the Nagoya Protocol, and the UN Declaration on the Rights of Indigenous Peoples), have the normative and institutional potential to move communities like the Konda Reddi from being passive custodians of forests, water bodies and other ecosystem components to active co-managers of these same ecosystem components.

However, due to ongoing barriers to implementation, including bureaucratic inertia, lack of coordination among institutions and commercial interests that focus on extracting natural resources rather than protecting them, these shared governance models are not being fully realised.

Therefore, a paradigmatic shift is needed from symbolic acknowledgement of indigenous knowledge systems to codified, enforceable, and participatory co-management models. To achieve this shift, it will be necessary to strengthen statutory protections for customary rights, to formalise the role of knowledge keepers in decision-making related to the use of natural resources, and to develop interdisciplinary research that translates bio-cultural knowledge into actionable ecological solutions.

Ultimately, using both traditional and modern ways is not only a moral responsibility and/or a method of conserving culture, but a viable approach to increasing the nation's ability to adapt to climate change, reduce water shortages and stop the ecological damage that is being done. The potential exists in India to develop a paradigm for environmental management that is based on inclusivity, equity, and sustainability and will enable the country's natural resources to be jointly managed by generations to come.