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ABOUT CELAR

The fundamental aim of the **Centre for Environmental Law, Advocacy, and Research (CELAR)** at the National Law University and Judicial Academy, Assam, is to engage in advocacy and research on public interest environmental concerns. It endeavours to do so by holding workshops and seminars to educate and improve skills, convening conferences to encourage the exchange of ideas, conducting training programs for capacity building in environmental law issues, undertaking legal research, and regularly publishing newsletters and journals.

The main objectives of CELAR can be elucidated as follows:

- Providing students with hands-on advocacy experience and direct exposure to the issues to inspire and educate them.
- Strengthen access to justice by conducting high-quality multi-disciplinary research on current environmental legal issues.
- Advocate for reforms in environmental law through scientifically sound legislative proposals.
- Organize training programs for civil servants, law enforcement agencies, non-governmental organisations, and media professionals to improve their legal capacity on environmental laws and policy.
- Publish environmental law publications and bulletins regularly.

Thus, to meet the last objective, '***Lex Terra***' is an initiative undertaken by CELAR. Through Lex Terra, we strive to provide a voice to various aspects of the environment, published quarterly, to create a community of environmentally conscious individuals from the legal and non-legal fraternity. Each issue of Lex Terra features important environmental news from across the world and from within the nation. This bulletin is meticulously compiled by CELAR members and is dedicated to enviro-legal enthusiasts around the country.

EDITOR-IN-CHIEF'S NOTE

Dr. Thangzakhup Tombing
Assistant Professor of Law, NLUJA, Assam

As we reflect on the legacy of more than 50 years of the Ramsar Convention and the contributions it has made to the development of international wetland conservation, the 46th issue of Lex Terra considers the specific challenges and opportunities of Northeast India. The Ramsar Convention is a global linchpin in the reforms and discussions around sustainable development; this issue contains articles that articulate ways to approach a comprehensive and lasting mechanism for protection in addressing local contexts. This special issue attempts at highlighting the three Ss, Stewardship, Sanctuary and Sovereignty, with each article expressing conservation and policy making with a different perspective, be it traditional or progressive.

Northeast India finds itself at multiple transitional points in its environmental history, given the importance of ecological richness and cultural diversity for the health of its ecosystems and communities depends on complex interactions between human agency and political structures. To deal with that challenge we use overlapping frameworks of stewardship, sanctuary and sovereignty that we feel are important for a sustainable future.

Stewardship frameworks can be found in much of the culture of the many Indigenous peoples of Northeast India. The instances of community and collective protection of sacred groves and the complexity of shifting cultivation (jhum) showed how extensive local knowledge around ecological cycles and the regeneration of resources is, and how that knowledge becomes expressed in multiple ways. Far less predictable than top-down conservation policies that often separate management from local populations, these are more about the direct experience of ancestors managing the land based upon that experience. Protected areas have been the cornerstone of conservation in nearly every context; however, they have often caused displacement or marginalization of

EDITOR-IN-CHIEF'S NOTE

local communities. Therefore, the dilemma is how to bridge the institutional container of "sanctuary" with the generational lived experience of communities as its custodians. A more responsive model would incorporate indigenous appreciation of nature, where administrative boundaries give way to co-created and shared bottom-up territories of conservation effort between state priorities and community experience.

The articles examine how technology, such as blockchain and a tree census, can serve as a modern tool for managing our natural resources. They also discuss the important role of traditional knowledge and the rights of indigenous peoples. Another article focuses on the vital role of indigenous communities in resource management. It stresses the need to incorporate their rights and traditional practices into policies for fair and sustainable management.. These submissions, including the analysis of wetland policies in India and the inclusion of indigenous knowledge in policymaking in the northeast, offer positive views on traditional values. Each article contributes to the shared goal of creating a more just and sustainable society.

EDITORIAL NOTE

In every epoch of human history, the tension between progress and preservation has shaped our collective destiny. Today, that tension is sharpened by the intensifying crises of climate change, biodiversity loss, and the commodification of natural resources. Hence not only the three Rs but the three Ss, stewardship, sanctuary, and sovereignty, in a region as culturally diverse and in need for biological preservation as the Northeast of India, are essential to the future of our ecosystem. The supervision, the preservation of vital habitats, and the rights of the local population are all intricately linked in this unique location, which is a global hub for biodiversity and is home to a variety of Indigenous cultures.
The Centre for Environmental Law, Advocacy and Research (CELAR) at the National Law University and Judicial Academy, Assam, is excited to bring upon the newest issue of lex terra. We hope that lex terra promulgates the idea of conservation and consciousness towards ecological depletion and continues to serves as a beacon, drawing together all the minds to deliberate on the critical decisions that will shape the future generations with a similar environmental legacy.

Northeast India exemplifies the intertwining of humans and the environment, where the traditional principle of stewardship will be pivotal influences in contemporary legal systems. As a vibrant ecosystem that hosts many species, it faces a growing threat, so it is imperative to seek out ways that enhance these havens. As jurists, researchers, and educators, we must ensure that the environmental question is not relegated to the periphery of our constitutional and international commitments, but is recognized as integral to the project of human dignity itself.

We hope, the articles in this issue will call for thoughtful discussion, and continue the efforts of scholars on a pathway towards a positive compromise between human desire and ecological resilience. I commend the authors, editors, and everyone involved in this issue for their commitment and hard work. I hope

Lex Terra remains a place where legal creativity faces ecological responsibility. I also wish for scholarship to be an act of both analysis and care.

The *first* article discusses the recent case of *MC Mehta* v. *Union of India*, wherein the Supreme Court of India highlighted the need to combat illegal tree felling in eco-sensitive zones through mandated periodic tree censuses. However, traditional methods, such as marking trees with non-durable paint, inconsistent data collection, and manual surveys, suffer from interoperability gaps, budgetary constraints, and human error. Blockchain technology's decentralized, immutable ledger system offers a transformative solution. Public access to blockchain records could boost community involvement, aiding climate action and urban planning. However, implementation barriers include high initial costs, technical expertise shortages, and the need for legislative reforms to formalize blockchain adoption. The author proposes public-private partnerships and capacity-building programs to mitigate these challenges. Blockchain integration promises robust, transparent tree census mechanisms, crucial for combating deforestation and promoting sustainable governance. While states like Maharashtra and Delhi have pioneered tech-driven approaches, extending blockchain frameworks to regions like the Northeast could strengthen conservation efforts, provided logistical and regulatory hurdles are addressed.

The second article examines the rights of indigenous communities in natural resource management in Assam, focusing on the forest resources, water management, and land rights of the Mishing, Bodo, and Karbi communities. The article highlights the complex relationship between traditional practices and modern legal frameworks, particularly how constitutional provisions, specific laws, and International Conventions impact indigenous rights in the region. Through case studies, the article illustrates the ongoing conflicts between customary laws and state policies, emphasizing the challenges indigenous communities face in accessing and managing resources.
The author discusses the resilience of indigenous management systems and their potential contribution to sustainable resource use. It points out the gaps in legal and policy frameworks that hinder the full realization of indigenous rights and stresses the need for more inclusive, culturally sensitive approaches to natural

resource governance.

The *third* article explores the significance of incorporating indigenous knowledge and traditional environmental practices into formal climate change laws and policies in Northeast India. The region, a biodiversity hotspot, is home to around 150 tribal groups whose sustainable practices have preserved ecosystems for generations. However, existing legal frameworks, such as the Biological Diversity Act, 2002, often fail to account for these practices, leading to ineffective implementation. The article highlights key customary practices, including the sacred groves of Meghalaya, where forests are protected due to spiritual beliefs, Nagaland's community forest management, which enables local councils to sustainably manage resources under Article 371(A), and Manipur's Phumdis and Ataphums, floating islands essential for biodiversity conservation.
To strengthen environmental laws, the article suggests granting legal recognition to these practices, involving indigenous communities in governance, and integrating traditional knowledge into policies like the Forest Rights Act, 2006, and Wetlands Rules, 2017. The author proposes that incentives, such as benefit-sharing mechanisms and eco-tourism initiatives, will encourage conservation.
The final article assesses a compelling case study on the conservation of Deepor beel, highlighting the critical challenges faced by Indian wetlands. It consists of a detailed examination of the vital ecosystem of the Ramsar site, its rich biodiversity and its crucial role for both the local and urban communities ofGuwahati and a robust analysis of the legal and judicial frameworks to protect it. The article explores the Wetlands (Conservation and Management) Rules, 2017, the Guwahati Water Bodies (Preservation and Conservation) Act, 2008, and the Ramsar Convention to show the strong legislative foundation which is underscored by the significant gap in law and practice. The article emphasizes the judiciary's vital role in holding polluters accountable and compelling government actions with cases like Rohit Chowdhary vs Union of India.

The article argues that the future of Deepor Beel and all other wetlands of India depends upon the collective commitment to prioritizing ecological health alongside economic development. As the Ramsar convention crosses half a century with it coming into force in 1975, this article, more than a critical analysis, calls for action for the preservation of one the 91 Ramsar sites in India

for the sustainable management of the nation's invaluable natural resources.

Lex Tera Editorial Board
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EVALUATING THE INTEGRATION OF BLOCKCHAIN TECHNOLOGY ON TREE CENSUS

~ *Siddharth Saxena*

I. INTRODUCTION

In the recent case of *MC Mehta* v. *Union of India & Ors*,[1] the Hon'ble Supreme Court of India highlighted the need of tree census to combat the illegal felling of trees in the eco-sensitive Taj Trapezium Zone ('TTZ'). While passing an order to mandate tree census in the TTZ, the bench of HMJ Abhay S Oka & HMJ Augustine George Masih emphasized that tree census can function as a mechanism to detect illegal felling of trees in the TTZ. While the idea of tree census is not a new concept under Environmental Law, the recent mandate and requirement in various metropolitan cities bring it to the forefront of discourse surrounding protecting eco-sensitive zones.

Recently, Municipal Corporation of Delhi ('MCD') completed its first-ever tree census in December 2023,[2] joining the league of states such as Maharashtra and Karnataka, managing to cover 80% of the existing tree cover in the region, marking trees' precise geo-coordinates and giving it a unique identification number by painting on the trees.[3] Though the step by MCD is laudable one, marking trees by painting is counterproductive since paint is not necessarily durable to withstand weather changes and requires manual recording. The requirement of tree census is ever-increasing in various states especially north-east Indian states whose forest cover has decreased due to deforestation and shifting cultivation practices coupled with illegal felling and sale of certain timber.[4]

Through this article, we explore the feasibility of integrating blockchain technology with tree census to enhance transparency, monitoring and public accountability. The attributes of blockchain technology such as immutability, public access and decentralized validation can create a robust mechanism for tree census which can integrate with future steps such as IoT (Internet of Things) integration such as sensors to ensure real-time updates and foster

[1] Writ Petition (Civil) No. 13381/1984.

[2] Paras Singh, *MCD Counts 198,000 Trees in First Tree Census*, HINDUSTAN TIMES, Apr. 4, 2024, https://www.hindustantimes.com/cities/delhi-news/mcd-counts-198-000-trees-in-first-tree-census-101712255381480.html (last visited Dec 14, 2024).

[3] *Id.*

[4] Mukut Das, '*75% of Country's Tree Cover Loss in 22 Years Happened in Northeast*,' THE TIMES OF INDIA, May 13, 2024, https://timesofindia.indiatimes.com/city/guwahati/75-of-countrys-tree-cover-loss-in-22-yrs-happened-in-ne/articleshow/110063886.cms (last visited Dec 13, 2024).

collective action and collaboration between public and state.

II. TREE CENSUS IN INDIA

Tree census in India is not a relatively new concept. Various state laws in India mandate setting up of a 'tree authority' to undertake tree census at periodic time periods. The Environment Protection Act, 1986 & The Forests Act, 1927 remain silent on conducting tree census to preserve trees and create a monitoring mechanism by counting of trees, categorizing and conducting periodic surveys. State laws such as The Delhi Preservation of Trees Act, 1994,[5] The Maharashtra (Urban Areas) Protection and Preservation of Trees Act, 1975,[6] mandate periodic tree census as a part of preservation initiatives, a union law on the subject matter is non-existent. A survey of notable states whereby initiatives of tree census have been undertaken by municipal authorities is presented as follows.

2.1. Maharashtra

Previously, the state law of Maharashtra, the Maharashtra (Urban Areas) Protection and Preservation of Trees Act, 1975 was silent on tree census. However, post 2021 amendment, tree census has become a mandate under Section 7 whereby local Tree Authorities have been tasked with the legal duty of conducting periodic census.[7] The tree census would comprise of various details of the tree specifically the species, height, age and health of the tree. The provision of protecting and identifying the heritage trees[8] was introduced through the 2021 amendment. Due to the legal mandate,[9] metropolitan cities such as Mumbai, Pune & Nagpur conduct periodic tree census with integration of technologies such as GIS & GPS for precise marking and accuracy.

2.1. Karnataka

Section 7 of the Karnataka Preservation of Trees Act, 1976 is similar to the legislation in Maharashtra mandating[10] a tree census by the officers. Tracking of the number of trees, maintaining a log of the variety of species and their health, prevention of illegal tree-cutting, and promotion of sustainable methods of forestry is the aim of these tree census. The metropolitan city of Bengaluru has led the way[11] in conducting tree census by encouraging

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[5] The Delhi Preservation of Trees Act, 1994, §7(b).
[6] The Maharashtra (Urban Areas) Protection and Preservation of Trees Act, 1975, §7(b).
[7] *Id.*
[8] The Maharashtra (Urban Areas) Protection and Preservation of Trees Act, 1975, §2(1a).
[9] *Supra*, note 6.
[10] The Karnataka Preservation of Trees Act, 1976, §7(b).
[11] Mohammed Yacoob, *2.5 Lakh Trees Counted in 80 Wards in BBMP Limits*, THE NEW INDIAN EXPRESS, Jul. 18, 2024, https://www.newindianexpress.com/cities/bengaluru/2024/Jul/18/25-lakh-trees-counted-in-80-wards-in-bbmp-limits (last visited Dec 12, 2024).

public participation[12] and indulging in other practices[13] for comprehensive data collection.

2.3. Delhi

The Delhi Preservation of Trees Act, 1994 talks about tree censuses under Section 7. There is a Tree Authority established, which has been tasked with the job of conducting surveys to gather information with regard to the species, age, condition of the trees while maintaining adequate records.[14] The official body, however, has had irregular and erratic censuses.[15] To cover this up, the citizens have taken various initiatives[16] at their level to collect data and maintain and monitor the green spaces and prevent illegal felling of trees in the capital.

While states like Maharashtra, Karnataka and Delhi have led the way by making tree-census mandatory through various State-specific legislations, other states including North-East states have non-existent state legislations that mandate tree census. Tree census becomes significant step in preserving environment in north-east India due to deforestation and practice of shifting cultivation. North-East region of India, being rich in biodiversity and natural resources, requires particular attention from an enviro-legal standpoint. Coupled with illegal activities of cutting and sale of certain timber,[17] tree census becomes increasingly imperative. Integration of technology like GPS mapping has been increasingly encouraged for accuracy as well as accessibility of the information being maintained. Tree census has a far-reaching consequence on biodiversity conservation, urban forestry and climate action.

III. INTEGRATION OF BLOCKCHAIN TECHNOLOGY FOR TREE CENSUS

The current conventional tree census methodologies include counting and marking the trees by paint majorly. These shortcomings can be attributed to various factors. One of the

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[12] Garima Parsher, *Citizens Can Now Shape Bengaluru's Tree Census*, BANGALORE MIRROR, Nov. 23, 2024, https://bangaloremirror.indiatimes.com/bangalore/civic/citizens-can-now-shape-bengalurus-tree-census/articleshow/115576717.cms (last visited Dec 12, 2024).

[13] Express News Service, *Residents Invited to Participate as Bengaluru Civic Body Speeds up Tree Census*, THE INDIAN EXPRESS, Nov. 27, 2024, https://indianexpress.com/article/cities/bangalore/residents-invited-to-participate-as-bengaluru-civic-body-speeds-up-tree-census-9692620/ (last visited Dec 13, 2024).

[7] Supra, note 5.

[8] The Maharashtra (Urban Areas) Protection and Preservation of Trees Act, 1975, §2(1a).

[9] *Supra*, note 6.

[15] Jasjeev Gandhiok, *30 Years of Tree Act: A Tussle for Green Cover in Delhi*, HINDUSTAN TIMES, Oct. 21, 2024, https://www.hindustantimes.com/cities/delhi-news/30-years-of-tree-act-a-tussle-for-green-cover-in-delhi-101729449358929.html (last visited Dec 11, 2024).

[16] Sukrita Baruah, *How Many Trees in Netaji Nagar? Citizen Volunteers Hope to Find Out*, THE INDIAN EXPRESS, Jul. 4, 2018, https://indianexpress.com/article/cities/delhi/delhi-trees-netaji-nagar-citizen-volunteers-hope-to-find-out-5244817/ (last visited Dec 12, 2024).

[17] D. T. E. Staff, *Logjam*, DOWN TO EARTH, Jan. 5, 2012, https://www.downtoearth.org.in/environment/logjam-14223 (last visited Dec 11, 2024).

foremost factors that greatly affect the tree census is lack of standards in data collection. The data collected in the tree census is rarely inter-operable with different states. The collection methods vary, let alone the reporting and recording of tree data such as species, girth, height, age and health of the tree. The significant disadvantage of lack of budgets allocated by the municipal authorities is a contributing factor. While cities such as Mumbai & Pune can spend on integration of technology for tracking and recording such as GIS & GPS, many areas are left at the helm of manual surveys. The lack of interoperability gives birth to another downside in the current methodology – non-existent centralized platform for storing and accessing data of various tree censuses. The non-existence of the platform gives non-access to policymakers and public diminishing public administration, trust, transparency, access and state-public partnership. The presence of human error in marking the trees cannot be sidelined. The existing errors coupled with human error severely undermine the accuracy of tree census data.

Though Maharashtra, Karnataka & Delhi have the legal mandate to conduct periodic tree census yet the activity of conducting periodic tree census has been fairly reactive[18][19] to the public. This can be seen in the recent case of TTZ, whereby the Hon'ble Supreme Court of India emphasized that for subject matter of environment, harsh orders must be passed.[20] The Apex Court highlighted the ever-increasing need for tree census in eco-sensitive zones to track and combat illegal felling of trees.[21] Lack of public engagement in tree census activities leads to reduced transparency and community involvement. The public remains largely uninformed about the outcomes of tree census thereby severely reducing the chances of fruitful state-public partnership and collective action.

At this outset, blockchain technology[22] through its attributes of immutability, decentralization and multiple user validation can serve as a solution to significantly enhance tree census methodologies as well as state-public partnership and collective action. Being a decentralized immutable ledger, public blockchain platforms can store tree census data on different parameters with multiple user validation ensuring greater accessibility and tamper

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[18] Prashasti Shandilya, *Delhi Rallies to Save 16,500 Trees from Being Cut*, INDIA TODAY, Jun. 22, 2018, https://www.indiatoday.in/india/story/delhi-rallies-to-save-16-500-trees-from-being-cut-1266946-2018-06-22 (last visited Dec 12, 2024).

[19] Adak, *Citywide Outrage Turns into Support as Trees in Delhi Are Cleared for High Rise Buildings*, INDIA TODAY, Jun. 22, 2018, https://www.indiatoday.in/mail-today/story/citywide-outrage-turns-into-support-as-trees-in-delhi-are-cleared-for-high-rise-buildings-1266691-2018-06-21 (last visited Dec 12, 2024).

[20] Supra, note 1.

[21] *Id.*

[22] Ministry of Electronics & Information Technology, *About Blockchain*, *Centre Of Excellence In Blockchain Technology,* https://blockchain.gov.in/Home/BlockChain?blockchain=blockchain (last visited Dec 12, 2024).

proof records. The specificities of tree census data like species, health, age and location could be uniquely stored on the blockchain. Any changes to the data stored on the blockchain would require multiple user validation reducing the chance of tampering with tree census data ensuring precise tracking and mapping of trees in the area.

Public blockchains[23] can allow public to access the data in addition to policy makers to formulate policies based on the tree census data and enhance over time. Public access would foster trust and transparency with the public greatly enhancing collective action and collaboration in tree conservation efforts. Moreover, blockchain technologies could be easily integrated[24] with the framework of Internet of Things (IoT) such as GPS sensors which can facilities real time update and monitoring of tree data.

Blockchain technology not only enhances the efficiency of data management but also promotes and aids transparency.[25] The methodology being used currently encounters certain glitches due to the substantial amount of data being generated and processed in urban areas with higher tree density. For a better approach which is comprehensive in nature, the decentralized architecture of this technology leads to smoother integration as well as sharing of data. It allows various stakeholders such as local municipalities, non-governmental organizations and other citizens groups to work in partnership on a single platform reducing duplicity of efforts and ensuring consistency in the work being done.

Blockchain technology leads to an intelligent way of urban governance.[26] Blockchain-enabled tree census will lead to better insights on usage of land, development of infrastructure and action for climate in the urban areas. Data can help in identifying regions which has a reducing tree-cover and promote tree plantation drives by the stakeholders. This data may also be utilised for making policies and legislations and allocation of resources based on real numbers rather than assumptions.

The challenges that come with introducing technology for tree census requires solutions for necessary implementation. There is a huge initial investment and requirement of technically-

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[23] Ministry of Electronics & Information Technology, *Types of Blockchain,* https://blockchain.gov.in/Home/BlockChain?blockchain=type (last visited Dec 12, 2024).

[24] Ana Reyna et al., *On Blockchain and Its Integration with IoT. Challenges and Opportunities*, 88 FUTURE GENERATION COMPUTER SYSTEMS 173 (2018).

[25] Luzia Menegotto Frick de Moura, Daniela Francisco Brauner & Raquel Janissek-Muniz, *Blockchain and a Technological Perspective for Public Administration: A Systematic Review*, 24 REV. ADM. CONTEMP. 259 (2020).

[26] Sunil Subrahmanyam Yadavalli, *The Role of Blockchain Technology in E-Governance – A Study on Transforming Governance*, 1 SAMRIDDHI 86 (2024).

sound individuals which may be a dissuading factor for the municipal bodies with their limited sanctioned budgets. Public-private partnerships may be instrumental in overcoming this challenge along with capacity building programmes. A robust legislative framework is also necessary for assigning responsibilities and enhancing accountability of the activities to be undertaken. The existing legislations may be amended to incorporate blockchain technology and its usage for data management of tree coverage and other related issues under urban governance.

IV. CONCLUSION

The pre-existing deficiencies in the conventional tree census methodologies such as non-existent interoperability, lack of public participation and access greatly reduce the effectiveness of tree census as well as the ancillary outcomes of tree census such as collective action and collaboration of state and public to conserve trees. Blockchain technology serves a transformative solution with its attributes of immutability, decentralization and data validation by multiples users creating a robust platform of tree census data management. In addition, a uniform blockchain based platform for tree census would foster interoperability between states in regard to data access and collaboration. Publicly accessible blockchain would present an opportunity for public to have state responsible for its actions and not remain a fairly reactive one. In North-East states such as Assam, blockchain technology coupled with the creation of legal mandate of tree census would bolster public participation and accountability. Though integration of blockchain technology aligns with the broader picture of sustainable climate resilience and urban governance, yet various factors need to be taken into consideration for effective implementation and deployment of technology for tree census.

RIGHTS OF INDIGENOUS COMMUNITIES IN NATURAL RESOURCE MANAGEMENT: CASE STUDIES FROM ASSAM

~ *Amal Singh Patel*

I. INTRODUCTION

Assam, located in northeastern India, is home to diverse indigenous communities. These groups have inhabited the region for centuries. They have unique cultural traditions and deep connections to the land. The state recognizes several tribes as Scheduled Tribes under the Constitution.[1]

Major indigenous groups in Assam include the Bodos, Karbis, and Mishings. Each community has its distinct language, customs, and traditional practices. They have developed sustainable ways to manage natural resources over generations. Their knowledge is crucial for maintaining ecological balance.[2] The British colonial era brought significant changes to indigenous land rights. The Assam Land and Revenue Regulation of 1886 altered traditional systems. It introduced new land ownership concepts. This shift impacted indigenous communities' access to forests and water bodies.[3]

Post-independence, the Sixth Schedule of the Indian Constitution provided some autonomy. It established Autonomous District Councils in certain areas. These councils aim to protect tribal interests and customs. However, implementation challenges persist in many regions.[4] Indigenous communities face ongoing struggles for resource rights. Development projects often clash with their interests. Issues like deforestation and land alienation threaten their livelihoods. Legal recognition of customary rights remains incomplete in many cases.[5]

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[1] INDIA CONST, art. 342.

[2] Vandana Upadhyay, *Indigenous People's Forest Tenure in India* (2003) 44 Intl J Legal Info 228.

[3] Assam Land and Revenue Regulation, 1886.

[4] Constitution of India, Sixth Schedule.

[5] Virginius Xaxa, *Tribes and Development: Retrospect and Prospect in Nathan Glazer & Daniel P Moynihan*, eds, Ethnicity: Theory and Experience (Harvard University Press, 1975) 178.

II. LEGAL FRAMEWORK

2.1. International laws and conventions

The rights of indigenous communities are protected by various international instruments. The UN Declaration on the Rights of Indigenous Peoples is a landmark document. It affirms the right to self-determination and control over natural resources. This declaration, though not legally binding, sets important standards.[6]

The International Labour Organization Convention 169 is another crucial instrument. It recognizes indigenous peoples' rights to their ancestral lands and resources. The convention emphasizes the need for consultation and participation in decision-making. India has not ratified this convention, but it influences global norms.[7]

The Convention on Biological Diversity acknowledges indigenous knowledge in conservation. It promotes the equitable sharing of benefits from genetic resources. This treaty has implications for traditional resource management practices. It encourages states to respect and preserve indigenous knowledge.[8]

The Nagoya Protocol strengthens provisions for access and benefit-sharing. It requires prior informed consent from indigenous communities. This protocol aims to prevent biopiracy and protect traditional knowledge. Its implementation faces challenges in many countries, including India.[9]

2.2. Indian Constitutional provisions

The Indian Constitution provides several safeguards for indigenous communities. Article 244(2) and the Sixth Schedule are key provisions. They establish Autonomous District Councils in certain northeastern states. These councils have powers to manage natural resources and customary laws.[10]

Article 371B grants special provisions to Assam. It allows for the protection of tribal interests. The provision enables the creation of autonomous regions. This constitutional

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[6] G.A. Res. 61/295, United Nations Declaration on the Rights of Indigenous Peoples (Sept. 13, 2007).
[7] International Labour Organization, Indigenous and Tribal Peoples Convention, C169 (1989).
[8] United Nations, Convention on Biological Diversity, 1760 U.N.T.S. 69 (1992).
[9] 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 (Oct. 29, 2010).
[10] INDIA CONST. art. 244, sch. 6.

recognition is crucial for indigenous rights in Assam.[11]

The Fifth Schedule of the Constitution is relevant to other parts of India. It provides for the administration of Scheduled Areas. The Governor has special powers to protect tribal interests in these areas. However, its application is limited in the northeastern region.[12]

Article 29 protects the cultural and educational rights of minorities. This provision can be invoked to safeguard indigenous practices. It includes traditional knowledge related to natural resource management. Courts have interpreted this article broadly in favor of cultural preservation.[13]

2.3. Specific laws applicable to Assam

The Assam Land and Revenue Regulation of 1886 remains a significant law. It governs land rights and revenue collection in the state. The regulation has been amended several times. Its provisions impact indigenous communities' access to land resources.[14]

The Scheduled Tribes and Other Traditional Forest Dwellers Act, 2006, is crucial. It recognizes forest rights of tribal communities. The act aims to correct historical injustices. Implementation in Assam has faced challenges due to unique local contexts.[15]

The Assam Tribal Land Rights Protection Act, 2022, is a recent development. It seeks to protect tribal land from encroachment. The act prohibits transfer of tribal land to non-tribals. Its effectiveness is yet to be fully assessed.[16]

The Biological Diversity Act, 2002, has implications for Assam's indigenous communities. It regulates access to biological resources and associated knowledge. The act establishes Biodiversity Management Committees at local levels. These committees can include indigenous representatives.[17]

[11] INDIA CONST. art. 371B.
[12] INDIA CONST. sch. 5.
[13] INDIA CONST. art. 29.
[14] Assam Land and Revenue Regulation, 1886.
[15] The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, No. 2, Acts of Parliament, 2007 (India).
[16] Assam Tribal Land Rights Protection Act, 2022.
[17] The Biological Diversity Act, 2002, No. 18, Acts of Parliament, 2003 (India).

III. CASE STUDY 1: FOREST RESOURCES MANAGEMENT

The Mishing community in Assam's Jorhat district offers a compelling case study. This tribe has long-standing traditions of forest management. Their practices reflect deep ecological knowledge and sustainable resource use. The community's approach clashes with state-imposed forest regulations.[18] Mishing customary laws govern forest use through a system called "Rigbo". This system allocates forest areas to families for sustainable harvesting. It prohibits over-exploitation and promotes regeneration. The Forest Department often overlooks these traditional practices.[19]

A conflict arose when the state declared parts of Mishing-managed forests as Reserved Forests. This decision restricted the community's access to vital resources. The tribe challenged this in the Gauhati High Court. The court recognized their customary rights in part.[20] The case highlighted the need for integrating traditional and modern approaches. Joint Forest Management (JFM) initiatives were introduced as a compromise. However, JFM's implementation has been problematic. It often fails to fully incorporate indigenous knowledge.[21]

The Mishing case demonstrates the complex interplay of laws and customs. It reveals gaps in recognizing traditional forest management systems. The community's struggle continues, balancing conservation with livelihood needs. This case underscores the importance of inclusive forest governance.[22]

IV. CASE STUDY 2: WATER RESOURCES MANAGEMENT

The Bodo community in Assam's Kokrajhar district presents a unique case of water management. Their traditional practices center around the concept of 'Boro Gwthar'. This system involves communal ownership and management of water bodies. It has sustained their agricultural practices for generations.[23]

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[18] Arupjyoti Saikia, *Forests and Ecological History of Assam*, 1826-2000 (Oxford University Press, 2011) 156.

[19] Indrani Phukan, *Community Forest Management: A Case Study of Mishing Tribe in Assam* (2018) 7:4 Intl J Humanities & Soc Sci 23.

[20] Mishing Autonomous Council v. State of Assam, (2010) 5 Gau LR 168.

[21] Ministry of Environment and Forests, Government of India, Joint Forest Management: A Handbook (1990).

[22] Sailajananda Saikia, *Forest Rights, Conservation and Conflict in Assam* (2017) 52:25-26 Econ & Pol Wkly 40.

[23] Prasenjit Biswas, Ethnic Conflicts in Bodo Areas of Assam: A Study of Water Resource Management (2015) 51:3 Indian J Pub Admin 457.

The Bodo system faced challenges with the implementation of state water policies. The Assam Irrigation Act, 1983, centralized water resource control. This legislation overlooked indigenous water management techniques. It led to conflicts between state authorities and Bodo communities.[24]

A significant legal battle emerged when the government proposed a dam on the Pagladiya River. The project threatened to submerge Bodo ancestral lands. Community leaders filed a petition in the National Green Tribunal. They argued for their right to manage local water resources.[25] The Tribunal's ruling acknowledged the importance of traditional knowledge. It mandated the inclusion of Bodo representatives in the project's planning. This decision marked a shift towards recognizing indigenous water rights. However, implementation remains a challenge.[26]

The case highlights the need for integrating customary and statutory water laws. It demonstrates the resilience of indigenous water management systems. The Bodo community's struggle continues to influence water governance in Assam. Their experience offers valuable lessons for sustainable water resource management.[27]

V. CASE STUDY 3: LAND RIGHTS AND NATURAL RESOURCE ACCESS

The Karbi community in Assam's Karbi Anglong district offers a compelling case study. Their traditional land tenure system, known as 'Inglong', governs resource access. This system allocates land based on customary laws and community needs. It has sustained their livelihoods for generations.[28]

The Sixth Schedule of the Constitution grants autonomy to Karbi Anglong. However, implementation of this provision has been problematic. State interventions often conflict with Karbi customary laws. This has led to tensions over land ownership and resource management.[29]

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[24] Assam Irrigation Act, 1983, No. 18 of 1983 (India).

[25] Bodoland Territorial Council v. State of Assam, NGT Application No. 38/2014 (PB) (Oct. 17, 2015).

[26] Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India, National Water Policy (2012).

[27] Niranjan Pani, *Traditional Water Management Systems in Northeast India: A Case Study of Bodos in Assam* (2018) 24:2 J Rural Dev 215.

[28] Jeuti Barooah, Property and Women's Inheritance Rights in the Tribal Areas of the North East in Walter Fernandes & Sanjay Barbora, eds, Land, People and Politics: Contest over Tribal Land in Northeast India (North Eastern Social Research Centre, 2008) 99.

[29] INDIA CONST. sch. 6.

A significant legal battle erupted over a limestone mining project. The Karbi Anglong Autonomous Council approved the project. Local Karbi communities opposed it, citing threat to their ancestral lands. They filed a petition in the Gauhati High Court.[30] The court's ruling highlighted the complex interplay of laws. It recognized the Autonomous Council's authority under the Sixth Schedule. However, it also emphasized the need to protect indigenous rights. The judgement mandated community consultation for such projects.[31]

This case underscores the challenges in reconciling statutory and customary laws. It reveals gaps in the implementation of constitutional safeguards. The Karbi community's struggle continues to shape discourse on indigenous land rights. Their experience offers valuable insights for policy reform in Assam.[32]

VI. LEGAL AND POLICY RECOMMENDATIONS

The protection of indigenous rights in Assam requires comprehensive legal and policy reforms. Strengthening the implementation of the Sixth Schedule is crucial. This involves empowering Autonomous District Councils with greater decision-making authority. State interventions should be limited to ensure genuine autonomy.[33]

Amending the Assam Land and Revenue Regulation is necessary. The law should recognize customary land tenure systems. This would help prevent land alienation and protect indigenous resource rights. Introducing provisions for community land titles could be beneficial.[34]

A state-level policy on traditional knowledge systems is recommended. This policy should mandate the documentation and integration of indigenous practices. It can guide resource management strategies across various sectors. Such a policy would enhance the relevance of traditional ecological knowledge.[35]

Establishing specialized environmental courts in Assam could improve access to justice.

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[30] Karbi Students Association v. State of Assam, (2013) 2 Gau LT 238.

[31] Ministry of Tribal Affairs, Government of India, Report of the High Level Committee on Socio-Economic, Health and Educational Status of Tribal Communities of India (2014).

[32] Walter Fernandes, Land as Livelihood vs Land as Commodity in India (2009) 8:33 Agenda 1.

[33] INDIA CONST. sch. 6.

[34] Assam Land and Revenue Regulation, 1886.

[35] National Biodiversity Authority, Government of India, Guidelines for Access to Biological Resources and Associated Knowledge and Benefits Sharing Regulations (2014).

These courts should have expertise in both environmental and tribal laws. They can effectively address conflicts between statutory and customary norms. This would ensure more nuanced judgments in resource-related disputes.[36]

VII. CONCLUSION

The rights of indigenous communities in Assam's natural resource management face complex challenges. Legal frameworks often conflict with traditional practices, creating tensions. The case studies reveal a disconnect between statutory laws and customary norms. This gap hinders effective resource governance and sustainable development.[37]

Constitutional provisions and specific laws provide a foundation for indigenous rights. However, implementation remains problematic. The Sixth Schedule's autonomy provisions are often undermined by state interventions. This situation calls for a more nuanced approach to resource management policies.[38]

Traditional ecological knowledge plays a crucial role in sustainable resource use. The Mishing, Bodo, and Karbi communities demonstrate this through their practices. Their systems offer valuable insights for modern conservation efforts. Integrating these practices into formal policies could enhance resource management.[39] Legal battles have highlighted the need for inclusive decision-making processes. Court judgments increasingly recognize the importance of community consultation. This trend suggests a growing awareness of indigenous rights. Yet, translating legal recognition into practical outcomes remains a challenge.[40]

The way forward requires a collaborative approach to natural resource management. Policy reforms should aim to harmonize statutory and customary laws. Capacity building for indigenous communities is essential. Empowering them to participate in resource governance can lead to more sustainable outcomes.[41]

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[36] Law Commission of India, 186th Report on Proposal to Constitute Environment Courts (2003).
[37] Virginius Xaxa, State, Society, and Tribes: Issues in Post-Colonial India (Pearson, 2008) 78.
[38] INDIA CONST. sch. 6.
[39] Arupjyoti Saikia, Imperialism, Geology and Petroleum: History of Oil in Colonial Assam (2011) 46:12 Econ & Pol Wkly 48.
[40] Samata v. State of Andhra Pradesh, (1997) 8 SCC 191.
[41] Ministry of Environment, Forest and Climate Change, Government of India, National Forest Policy (2018).

INTEGRATING CUSTOMARY ENVIRONMENTAL PRACTICES IN NE INDIA INTO CLIMATE POLICY

~ *Aditya Maharwal*

I. INTRODUCTION

NE, India, known as part of the Eastern Himalaya hotspot, boasts vibrant biodiversity and is home to around 150 tribal groups.[1] These varied communities in NE India have developed distinct beliefs, rituals, and traditions shaped by their encounters with the natural surroundings. This Indigenous knowledge continuously evolves and is utilised to build[2] techniques that allow these tribes to coexist sustainably with the environment. Integrating customary environmental practices into climate change law and policy is crucial for enhancing resilience in Northeast India. By recognising and incorporating these traditional methods into formal policies, there is potential for improved ecological outcomes and empowering local communities in climate governance.[3]

Despite its strategically significant location, which greatly influences the activities of nearly all the states in the region, there is a notable scarcity of documents and research on the climate change scenario in Northeast India. As a result, this article aims to illuminate how these indigenous techniques could be integrated with climate change laws.

II. WHY DO WE NEED TO INTEGRATE THESE PRACTICES?

There is a need to integrate customary practices into the climate-changing laws of the NE region because of its unique character. Some special provisions are needed to fulfil these needs and find practical solutions for the region.

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[1] Tsenbeni N Lotha, *Climate Change Impact and Traditional Adaptation Practices in Northeast India*: A Review, Vol. 19 CWEJOURNAL 560 (2024).

[2] Kaberi Singha, Indigenous Knowledge In Education In North-East India, Master's Thesis, University Gothenburg, 2021.

[3] H. Tynsong, Traditional ecological knowledge of tribal communities of North East India, Volume 21, Biodiversitas, 3209, 3210, (2020).

Let's look at the example of the Biodiversity Act 2002.[4] India enacted this act as part of the United Nations Conference on Biological Diversity of 1992. This act provided for opening State Biodiversity Boards in all the states of the region.

However, these boards were unable to adequately address the needs of the region despite successfully fulfilling the technical and scientific objectives of the act because it didn't involve the Indigenous villagers, and in the NE region, villages serve as the focal point for all social, political, and economic activities, acting as the primary hub where community interactions, governance, and economic exchanges converge. Plus, the addition of Indigenous communities on the board who are connected to the region could help solve grassroots problems such as the open international borders of the region and the challenging topography hindering the effective implementation of laws on biological resource management and benefit-sharing and smuggling of endemic species becomes an issue. The best way to safeguard these resources is to engage indigenous communities.[5]

Through this example, it can be seen how Indigenous and customary authorities play a pivotal role in the law-making as well as the implementation of the law process in the NE region.

III. EXISTING CUSTOMARY ENVIRONMENTAL PRACTICES IN NORTH INDIA

Customary Environmental Practices in Northeast India are firmly established in the tradition of Indigenous communities, and they offer practical and sustainable solutions for environmental management. If they are incorporated into the laws, they could profoundly enhance environmental laws by aligning them with the region's distinctive ecological and cultural heritage. Some of these customary practices are :

3.1. Sacred Groves of Meghalaya (Law Kyantang)

Sacred groves are particular areas in a vast landscape, including trees, plants and other natural elements that are protected by the Indigenous communities as they believe it has a deep connection to the divine, and they are honouring it by maintaining and preserving it.[6] Local Communities even forbid anyone from cutting the trees in these groves. Unlike the

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[4] The Biological Diversity Act, 2002, No. 18, Acts of Parliament, 2002 (India).

[5] Dr. Moatoshi Ao, *BRANDING AND COMMERCIALISATION OF TRADITIONAL KNOWLEDGE AND TRADITIONAL CULTURAL EXPRESSIONS: Customary Law of North East Vis-à-Vis Contemporary Law*, vol. 6, IPJLCR 75, 82 (2020).

[6] Hughes, J. Donald & Chandran, *Sacred Groves Around the Earth: An Overview*, in Conserving the Sacred: For Biodiversity Management, 69, Oxford Univ. Press, 1998.

legal method of conserving forests, sacred groves provide a more participatory way of conservation - led by the local people's religious beliefs, norms and taboos. Since they have been left untouched for centuries, these groves are rich in floral and faunal elements and have a wide variety of habitats.[7]

3.2. Nagaland's Village Councils and Community Forest Management

In Nagaland, local people participate highly in the forest-management program initiated by the Joint Forest Management system implemented in 1997.8 With this system, active engagement of the local village councils is permitted to manage the sustainable preservation of resources from the forests. Since over 90% of the forest land is community-owned, Article 371 (A) of the Indian Constitution, the JFM has endeavoured to make more joint ventures between the government and local communities such that it aligns itself with the National Forest Policy.[9]

3.3. Phumdis and Ataphums of Manipur

Phumdis are floating circular masses of decomposed vegetation, soil, and organic matter on Loktak Lake, northeastern India.[10] They support various types of flora and fauna habitats. It contains endangered species that play an important role in the ecosystem and ecological balance of the lake. In contrast, ataphums are anthropogenically developed floating gardens constructed to meet anthropogenic demands. Both phumdis and ataphums carry great ecological, cultural, and economic significance.[11]

Over time, these phumdis have developed distinct niches for wide varieties of plants and animals. The other ataphums were the artificial floating gardens were prepared by the local people, piling different layers of vegetation and soil on a structure made of interlinked bamboo frames. Now, these phumdis cover approximately 50% of the lake.[12] It was the

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[7] Law Kyntang, *The Sacred Groves Of Meghalaya Where Cutting Of Trees Is Prohibited By Locals*, INDIA TIMES(Dec. 14, 2024), https://www.indiatimes.com/news/india/the-sacred-groves-of-meghalaya-where-cutting-of-trees-is-prohibited-by-locals-603791.html.

[8] *How government and community come together to manage forest in Nagaland*, MORUNG EXPRESS (Dec. 14, 2024), https://morungexpress.com/how-government-and-community-come-together-to-manage-forest-in-nagaland.

[9] Management of Forests, Nagaland Forest Department (DEc. 14, 2024), https://forest.nagaland.gov.in/management-of-forests/.

[10] Abha Lakshmi Singh & Moirang L. Khundrakpam, *Phumdi proliferation: A case study of Loktak lake, Manipur*, Water and Environment Journal (2009).

[11] Ministry of Housing and Urban Affairs, Government of India, 17-18, 2023, https://niua.in/intranet/sites/default/files/2853.pdf.

[12] *ibid.*

human pressure that aided the growth of the phumdis. It shows the sustainable practices of a local community living with nature.

IV. INTEGRATING CUSTOMARY PRACTICES INTO LEGAL FRAMEWORKS

Incorporating customary environmental practices from North India into formal laws may further strengthen environmental legislation with traditional wisdom and community-based approaches embedded into modern governance frames. These, as deeply rooted in generational ecological knowledge, reflect effective, time-tested means for sustainable resource management as well as biodiversity conservation. It is then possible to develop policies that are both environmentally friendly and consistent with the values and lifestyles of local communities through the alignment of laws with these cultural practices. They can contribute by –

4.1. In the case of the Sacred groves of Meghalaya -

- **Recognition as Protected Zones**: Sacred groves could be declared as legally protected biodiversity areas under national and state environment legislations, as given in the Biological Diversity Act, 2002.[13] These can also be identified and mapped by engaging with local communities such that their boundaries are respected and preserved.[14]
- **Community Role in Management**: Laws can institutionalize local communities' participation in sacred grove governance and protection. Co-management frameworks with local councils or tribal institutions, in partnership with the environmental authorities. Legal recognition of traditional norms, rituals, and taboos that guarantee the long-term use of these areas' resources.
- **Funding and Support:** Government schemes can provide funds for the maintenance and conservation of sacred groves. Incentives for eco-tourism projects can be given, with the revenue being shared with local communities to encourage conservation efforts.[15]
- **Integration into Forest and Biodiversity Policies**: Add the sacred groves to the biodiversity action plan and outline standards where development and exploitation are prohibited to harm its ecological and cultural importance. Implement punishment for practices degrading such systems as logging, poaching, and land invasion.

[13] supra note,4

[14] Government of Chhattisgarh, *Protection and Conservation of Sacred Groves*, https://forest.cg.gov.in/cms/media/871c6092-ebed-4e30-8afb-7d22b314009c_Sacred_Groove1901.pdf.

[15] Ministry of Environment, Forest and Climate Change, Sacred Groves Protection, PIB DELHI, https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2004012.

4.2. In the case of Nagaland's Village Councils and Community Forest Management

- **Recognition of Customary Rights-** National and state legislation should acknowledge the rights of Indigenous and local communities to manage their natural resources. For instance, Nagaland's Article 371(A)[16] recognises customary laws and practices, giving communities control over forest resources. Such provisions can be expanded to other states.
- **Institutionalising Traditional Practices**—Codify the traditional practices of rotational forestry, sacred grove preservation, and bamboo cultivation in legal frameworks. For example, the sustainable harvesting methods in Mizoram can be formalised as state forest laws so that they do not overexploit and ensure ecological balance. [17]
- **Equitable Benefit-Sharing Mechanisms** - Formulate policies where communities are assured that they benefit proportionally from natural resource extraction, such as timber, bamboo, medicinal plants, or eco-tourism earnings. For example, the benefit-sharing provisions under the Biological Diversity Act, 2002,[18] may be expanded to include traditional forest products.
- **Integration into Climate Policies**- Traditional practices can contribute to climate change mitigation and adaptation. Legal frameworks like the Forest Rights Act, 2006[19] can recognize the carbon sequestration potential of community-managed forests and include these areas in carbon credit schemes.
- **Collaborative Governance Models**- Collaborative governance models are important for inclusive and effective conservation because they bring together state authority strengths and community institution strengths, providing a co-management system that offers shared decision-making responsibilities, and hence scientifically informed and culturally relevant policy-making. For instance, a JFM framework underpinned by collaboration between the forest department and the local communities can adapt itself in consonance with the customary institutions like the Nagas in Nagaland village councils and Mizoram's bamboo management systems.[20]

4.3. In the case of Phumdis and Ataphums of Manipur-

- **Recognition and Protection under Existing Laws-** Provide an inclusion of Phumdis and Ataphums under the legal framework of the Wetlands (Conservation and Management)

[16] INDIA CONST. art. 371, cl A.

[17] Forest Laws in India, ELR, https://www.elr.info/sites/default/files/files-pdf/india_update_2013_09_vol4_issue2_web.pdf.

[18] supra note,4.

[19] The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, No. 2, Acts of Parliament, 2006 (India).

[20] supra note, 9

[21] Wetlands (Conservation and Management) Rules, 2017, Gazette of India, Extraordinary, G.S.R. 108(E), 2017 (India)
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Rules, 2017, and declare the same as a critical component of Loktak Lake. Further amend the Manipur Loktak Lake (Protection) Act, 2006,[22] to have specific legal provisions giving them statutory protection as the essential habitats of the endangered Sangai deer.

- **Incentives for Conservation**- Provide incentives such as financial support or access to carbon credits for communities actively protecting Phumdis and ensuring sustainable fishing through Ataphums. Support ecotourism initiatives centred on Loktak Lake's ecological and cultural uniqueness with revenue-sharing mechanisms for local stakeholders.
- **Sustainable Harvesting and Usage Guidelines**- Legally establish guidelines for the use of Phumdis sustainably as fuel and in other uses so that they may not cause any ecological destruction. The construction and use of Ataphums should be regulated to control overfishing and balance ecology.
- **Monitoring and Research for Phumdis and Ataphums**- Monitoring and research are vital for the sustainable management of Phumdis and Ataphums since they have great ecological and economic importance in Loktak Lake. Legal mandates should be made to ensure continuous ecological monitoring of Phumdis to evaluate their health, stability, and role in the lake's ecosystem. Regular studies on the composition, growth patterns, and contribution to biodiversity conservation will help identify these threats, including degradation due to pollution, invasive species, and climate change.[23]

Likewise, encouraging scientific research on the practices of Ataphum would help assess its impact on the population of fish and biodiversity in water bodies. It would determine sustainable limits of fishing, minimize habitat disruption, and optimize traditional fishing techniques into those that work in conformity with modern goals for biodiversity conservation.

V. CONCLUSION

This integration of customary environmental practices into climate change laws and policies would provide a great opportunity to enhance the ecological resilience and governance structures of Northeast India. The region is endowed with rich biodiversity, which has been complemented by deep traditional knowledge held by indigenous communities. This framework is unique for sustainable resource management. These customary practices are deeply rooted in the cultural and ecological landscape, not only demonstrating effective conservation strategies but also upholding the principles of inclusivity and community

[22] Manipur Loktak Lake (Protection) Act, 2006, No. 3, 2006 (India).

[23] Sahana Ghosh, *Saving the world's only floating national park and its dancing deer,* MONGABAY, https://india.mongabay.com/2018/07/saving-the-worlds-only-floating-national-park-and-its-dancing-deer/.

participation.

As the cases of sacred groves of Meghalaya, Nagaland's community forest management, and Manipur's Phumdis and Ataphums depict, these practices reflect sustainability, respect for nature, and a balanced approach to resource use. Such legal frameworks can achieve multiple objectives: empower local communities, enhance biodiversity conservation, and create a robust defence against climate change impacts. Potential opportunities under these laws exist in the form of the Biological Diversity Act, 2002; Forest Rights Act, 2006; and Wetlands (Conservation and Management) Rules, 2017. Other measures to enhance the same may include co-management models, equitable benefit-sharing mechanisms, and incentives for conservation.

Further, incorporating mandates for monitoring and research allows these traditional practices to evolve along with environmental changes and the emergence of new issues, such as those brought about by climate change. Promoting scientific studies of traditional practices like Ataphums or rotational forestry can integrate traditional wisdom with modern conservation science and create dynamic synergy between them.

Through such actions, Northeast India is potentially placed to lead by example for the world on the basis of proving that sustainable environmental governance can actually work out. This approach protects ecological functions and, at the same time, ensures social equity and the preservation of indigenous culture. In the context of such an initiative, the region can take precedence in providing a global-scale model for the inclusion of traditional ecological knowledge into the design of modern climate governance.

PROTECTION OF WETLANDS IN INDIA– A CASE STUDY OF DEEPOR BEEL

~ *Bornaa Baruah*

I. INTRODUCTION

India's diversified climate and topography support a wide variety of water bodies and contribute to our nation's vast diversity of flora and wildlife. India's aquatic environment, which consists of wetlands, lakes, ponds and oceans, is a vital component of the urban ecosystem and supports human life in a variety of ways, from preventing flooding to supplying drinking water. However, the rate at which the aquatic ecosystem is deteriorating is frightening. Due to uncontrolled urban growth, wetlands, an integral aspect of the aquatic ecosystem, are seriously endangered. A large, naturally occurring wetland of great biological and environmental significance is the Deepor Beel. As of 2002, it is the only Ramsar site in the state of Assam and is endowed with rich vegetation. It is an important place for migratory birds, the locals who live nearby, and the movement of elephants.[1] The fishery, together with various edible herbs, fodder, and wood is the main source of income for the locals who live close to the Beel. Globally threatened birds like Spot-billed Pelican (Pelicanus philippensis), Lesser and Greater Adjutant Stork (Leptoptilos javanicus and dubius), and Baer's Pochard (Aythya baeri) can be seen in the Beel during winters.[2] The city of Guwahati uses the wetland as a natural water storage facility. The major threat to the Beel is the Boragaon landfills near it.[3] Up until its recent relocation to Betkuchi in 2021, 85–90% of the 550 tonnes of solid trash produced daily in Guwahati were transported to Boragaon.[4] Other than the threat of illegal dumping of waste, there is also the building of the railway right through the middle of the Beel and the construction of various buildings and apartments in the vicinity. On July 26 July 2023, the Guwahati High Court suggested certain measures for the protection and enhancement of Deepor Beel.[5] The suggestions

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[1] Information Sheet on Ramsar Wetlands (RIS), *https://rsis.ramsar.org/RISapp/files/RISrep/IN1207RIS.pdf*. (Feb. 16, 2024, 11:25 AM).

[2] *Id.*

[3] Action Plan for Deepar Beel Priority – III, https://www.pcbassam.org/RRC%20Action%20Plan%20Final/Priority%20III/Deepar%20Beel.pdf. (Jan. 15, 2024, 11:30PM).

[4] Anushka Saikia & Sampurna Adhyapak, *How locals are trying to save the dying Deepor Beel*, DownToEarth (Feb. 14, 2024, 1:22 PM), https://www.downtoearth.org.in/blog/environment/how-locals-are-trying-to-save-the-dying-deepor-beel-91050.

[5] Pramod Kalita & 2 Ors v. UOI & 17 Ors, PIL/18/2023.

included the construction of cycling and walking lanes in the periphery of the lake, the setting up of dedicated facilities that promote tourism like parks, and food courts, not allowing solid waste dumping in the lake, and possibly setting up sewage treatment plants at possible entry points of effluents, etc. All these measures are necessary to be taken up by the government to upkeep the health of the Beel and preserve the only wetland in the state.

II. LAWS PROTECTING WETLANDS IN INDIA

All around India, wetlands are under threat from reclamation, deterioration from drainage landfills, and pollution. These factors have led to a loss of biodiversity, a disturbance of the ecosystem, and a reduction in the functions that wetlands offer, such as aquifer recharge, water storage, and flood mitigation. For example, the spatial extent of Deepor Beel has decreased significantly between 1990 and 2010, if we examine the decadal fluctuations of the region covered by the beel.[6] To mitigate this, the Indian government has created laws and regulations aimed at protecting wetlands.

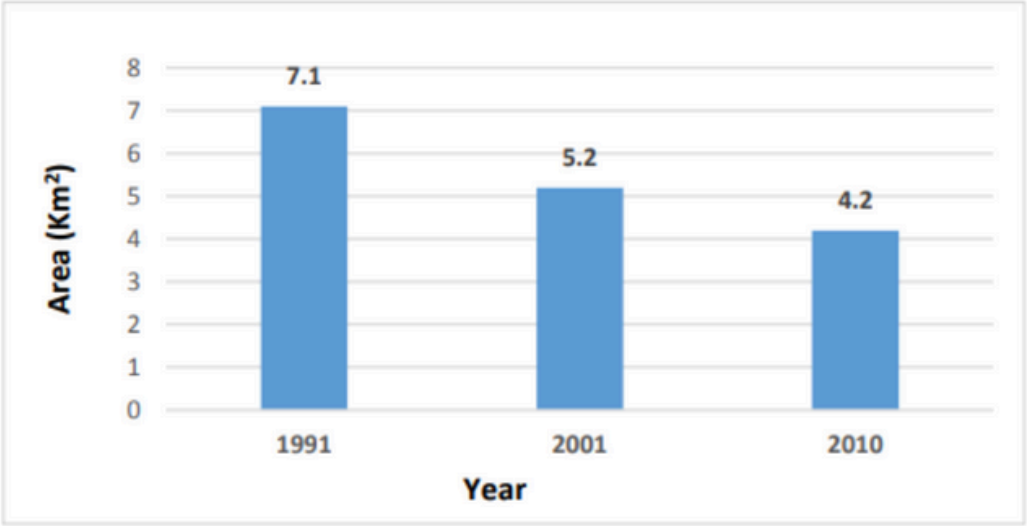

Fig 1: Decadal changes in the spatial extent of Deepor Beel (1990-2010)

2.1. Wetlands (Conservation and Management) Rules, 2017[7]

These regulations were enacted by the Indian government in order to better implement its goals for the management and preservation of wetlands throughout the nation. It states that

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[6] Supra note 2.

[7] Wetlands (Conservation and Management) Rules, 2017, Rules of Ministry of Environment, Forest and Climate Change, 2017 (India).

the administration and preservation of the wetlands shall be guided by the Wetlands Authority's interpretation of the "wise use" principle. It has prohibited certain activities, including the dumping of solid waste, poaching, the discharge of untreated wastes and effluents from cities and industry into the wetlands, encroachment of any kind, etc., in an effort to better conserve the wetlands. It has made the creation of State Wetlands Authorities necessary in every state. The State Wetlands Authority, under the direction of the Chairperson, is required to create a comprehensive digital inventory of all the wetlands in the state, to be updated every ten years. Furthermore, the establishment of a National Wetlands Committee has been mandated. The committee's responsibility is to oversee the several State Wetlands Authorities and the implementation of this legislation. The improvement of effective utilisation of wetlands is aided by the State Wetlands Authorities and the National Wetlands Committee, which are made up of specialists in hydrology, fisheries, and wetland ecology.

2.2. Wetlands (Conservation and Management) Rules, 2017[8]

Named after the Iranian town of Ramsar, the convention defines wetlands as "*areas of marsh, fen, peatland, or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.*" In 1982, India ratified the Convention, pledging to preserve and safeguard wetlands and potentially make up for any losses in wetland resources by establishing new nature reserves large enough to contain the remnants of the original environment. In addition to requiring all contracting parties to notify as soon as possible of any changes to the ecological character of any wetland within their borders brought about by pollution, technological advancements, or other human interference, the Convention also establishes a Conference of Contracting Parties to review and advance the convention's implementation. The Convention lacks an effective legal mechanism to implement its provisions, despite being a positive start in the right direction. The Convention's other faults include its absence of a funding system to assist the administration of Ramsar Sites and its failure to address day-to-day issues that wetland managers encounter, such as the convention's relatively limited practical demonstration of its concepts and guidelines. India's National Report on the Implementation of the Ramsar Convention on Wetlands in COP14, held in 2021, emphasized these issues. [9]

[8] Director, Office of International Standards and Legal Affairs, Convention on Wetlands of International Importance especially as Waterfowl Habitat Convention, 1971, UNESCO (Feb. 16, 2024, 1:02 PM), https://www.ramsar.org/sites/default/files/documents/library/current_convention_text_e.pdf.

[9] India, National Report on the Implementation of the Ramsar Convention on Wetlands, (February 16, 2024, 2 PM) https://www.ramsar.org/sites/default/files/documents/library/cop14nr_india_e.pdf.

2.3. The Guwahati Water Bodies (Preservation and Conservation) Act, 2008[10]

This act was created to preserve, protect, regulate, and maintain the waterbodies under the jurisdiction of the Guwahati Metropolitan Development Authority. It specifies certain areas of land in the Schedules mentioned in the Act, and in those specified areas, it prohibits activities that cause damage or reduce the size of the water bodies, prohibits the construction of any structure, dumping of solid waste, and carrying out any kind of business except those authorized by the Competent Authority. Considering the importance of urban water bodies, the Act provides for the restoration and conservation of these wetlands for the flood mitigating program under the Guwahati Development Department (GDD). The aforementioned laws support Deepor Beel's preservation and protection, either directly or indirectly. Due to their significant biological diversity, the two reserve forests that surround the Beel may be protected under the Biological Diversity Act of 2002. Also, the species of trees and animals found around the Beel are protected under the Wildlife (Protection) Act of 1972, as specified under Section 3 of the Wetlands (Conservation and Management) Rules, 2017.[11] Thus, the current regulations must be scrupulously carried out to protect Beel and transform it into a hub for sustainable ecotourism.

III. JUDICIAL ACTIVISM IN PRESERVING DEEPOR BEEL

The foundation for protecting the environment was laid down by the Supreme Court in *M.C. Mehta* v *Union of India*, stating that the right to a clean environment forms a part of Article 21[12] and therefore any disturbance to the air, water, and soil would be considered hazardous within the meaning of "life," recognised under Article 21. One of the major cases relating to the Beel's environmental damage of the Beel is *Rohit Choudhary* v. *Union of India and Ors*.[13] During the same case before the National Green Tribunal, one of the judges (S.P. Wangdi, J.) visited the Beel in August 2017, they stated that the following were noticed –

1. "*The dumping site does not fall beyond the water body but within it on the eastern side of the falling along the highway leading to the airport;*
2. *The water body is found to be filled with thick growth of hydrophytes all around it and certain islands of such hydrophytes formed in various parts in the middle of the lake;*
3. *Rampant encroachments of the water body by various constructions which were either industrial establishments or hotels of varying sizes or residential buildings, etc.*"

[10] The Guwahati Waterbodies (Preservation and Conservation) Act, 2008, No. 20, Acts of Government of Assam, 2008 (India).

[11] The Wild Life (Protection) Act, 1972, § 3, No. 53, Acts of Parliament, 1972 (India).

[12] INDIA CONST. ART. 21.

[13] Rohit Chowdhury v. Union of India, 2022 SCC OnLine NGT 1195.

Subsequently, the National Green Tribunal (NGT) instructed the state to implement temporary measures and established a committee led by the Chief Secretary of Assam. The committee convened and was determined to carry out an empirical investigation on "Deepor Beel" to determine the routes taken by elephants, with the help of the Wildlife Institute of India, Dehradun (henceforth, WII Dehradun). The Dehradun WII made several suggestions, including restricting the speed limit of trains through the stretch of Deepor Beel to 30 km/hr, regular patrolling near the railway track, etc. According to the Court, neither the legacy trash nor the solid waste was being managed in a way that followed scientific principles. Consequently, instructed the State to promptly establish a facility with sufficient capacity, scientifically treat waste, clean up legacy garbage, and periodically check the wetland's water quality. In the case of *Shakti Prasad Nayak* v. *Union of India*,[14] the Court ruled that the Railways would have to take the appropriate actions to lower the speed limit of trains that are traveling through dense forests and that officials and negligent drivers would face consequences if they did not comply with this directive. In this instance, the NGT reaffirmed the same and instructed the railways to take the necessary action. The Guwahati High Court was notified by the Assam government on January 12, 2024, that a draft notification designating the Deepor Beel Wildlife Sanctuary as an eco-sensitive zone was recently prepared and will be presented to the state cabinet for approval in two weeks.[15]

IV. CONCLUSION

Deepor Beel is an important natural resource that is imperative to maintaining ecological balance. It is the duty of every citizen as well as the government to ensure that the Beel is preserved. There should be better implementation of the rules and greater involvement of the citizens. Initiatives like Simang, which is a collective initiative by six women of Keotpara to use invasive weeds from the Beel in making artifacts and yoga mats, and Kumbhi Kagaz, which is another innovative initiative to convert water hyacinths into 100 percent biodegradable and chemical-free handmade papers, should be promoted. The youth of our country form a significant proportion of the country's population and therefore, they should be made aware of the values of biodiversity, especially wetlands, and steps to sustainably manage and conserve it.[16]

[14] Shakti Prasad Nayak v. Union of India, (2014) 15 SCC 514.

[15] Sentinel Digital Desk, Saving Deepor Beel, THE SENTINEL (Feb. 12, 2024, 1:36 PM), https://www.sentinelassam.com/more-news/editorial/saving-deepor-beel.

[16] India, National Biodiversity Target 1, CONVENTION ON BIOLOGICAL DIVERSITY, (Feb. 16, 2024, 4:09 PM), https://www.cbd.int/countries/targets?country=in.

Shooting and bird-trapping are prohibited by law but the enforcement is poor, hence steps should be taken accordingly.[17] The Beel area is designated as a Sanctuary by the Government of Assam which to some extent protects it but other conservation measures need to be implemented, like raising plantations on either side of the railway track to keep the noise down, construction in the hilly forest areas of the Beel should not be allowed, storm runoff from the city should be redirected to other low lying areas of the city to decrease the pressure on the Beel, sewage discharged into the Beel should be treated before being discharged into the Beel, etc. Emphasis should be placed on the capacity development of wetland managers to implement wise use of wetlands and their resources and training programs should be provided to wetland managers with emphasis placed on practical guidance on allocation and management of water for maintaining the ecological functions of wetlands. All these measures will ensure that the Beel is conserved and all the dependants of the Beel continue receiving its benefits. *No doubt economic development is imperative but it should not be at the cost of ecology, biodiversity, and the environment.*[18]

[17] *Supra* note 1

[18] M.C. Mehta v. Kamal Nath, (1997) 1 SCC 388.