ISSN: 0973-4929, Vol. 19, No. (2) 2024, Pg. 620-633

Current World Environment

www.cwejournal.org

Exploring Innovative Approach of Arbitration for the Resolution of Environmental Conflicts

ANKIT ANAND* and J VINCENT COMRAJ

School of Law, SRM Institute of Science and Technology, Kattankulathur (KTR), SRM Nagar, Chengalpattu District, Tamil Nadu, India.

Abstract

The absence of a dedicated institution for conflict management and ambiguous dispute resolution mechanisms have been a major obstacle for the international and Indian environmental law regime. Environmental laws have undergone significant changes to address critical hazards, however, they frequently encounter difficulties in resolving disputes promptly. Arbitration has emerged as an indispensable instrument, particularly by the Permanent Court of Arbitration Optional Rules for the Arbitration of Environmental Disputes, 2001 (PCAORAED, 2001). These rules are imperative for providing customised solutions and accommodating various stakeholders, such as states, Non-Government Organisations (NGOs), multinational corporations, and individuals, thereby establishing arbitration as an inclusive and accessible alternative. The article emphasises how arbitration, when backed by specialised experts and a dedication to practical solutions, has the potential to emerge as the principal forum for resolving environmental disputes. Additionally, it investigates the potential for arbitration, traditionally associated with commercial disputes, to be creatively adapted to address the intricacies of environmental conflicts. The study comprehensively examines the arbitration processes employed by the PCA and other international instruments, underscoring the necessity of new approaches to address contemporary environmental challenges.

Article History
Received: 01 March 2024
Accepted: 06 August 2024

Keywords
Arbitration;
Environmental Conflict;
Environmental Justice;
Environmental Law;
Permanent Court of Arbitration (PCA).

Introduction

Environmental regulation is a dynamic and expansive domain intricately linked to our planet's well-being.[1] It provides the foundation for addressing various challenges, including pollution, resource exploitation, global climate shifts, and other factors.[2] With its pervasive influence on human interests, communities, and various entities, resolving environmental disputes is complex and formidable.[3] The current increase in these disputes is a direct

CONTACT Ankit Anand ankitanandcnlu@gmail.com School of Law, SRM Institute of Science and Technology, Kattankulathur (KTR), SRM Nagar, Chengalpattu District, Tamil Nadu, India.

Doi: https://dx.doi.org/10.12944/CWE.19.2.9

result of the persistent advocacy of Non-Governmental Organisations (NGOs) seeking to protect our planet and combat environmental degradation, as well as a variety of international treaties, including the ground-breaking Paris Agreement of 2015.[4] Environmental challenges have moved beyond traditional state disputes to influence investor-state and commercial contractual disputes.[5]

The United Nations and the International Court of Justice have long been the preferred venues for resolving disputes between states in international environmental law, primarily through litigation.[6] Nevertheless, the conventional litigation approach has become progressively more cumbersome due to its formality, protracted timelines, and exorbitant costs.[7] The increasing caseload has strained the litigation process, resulting in complexities and delays.[8] Contrastingly, Alternative Dispute Resolution (ADR) is a methodical and practical approach to resolving these issues.[9] An extrajudicial approach to dispute resolution, ADR offers diverse instruments for resolving disputes between parties.[10] Despite its applicability to various legal matters, ADR is particularly prominent in resolving environmental conflicts.[11]ADR provides a variety of approaches, including mediation, conciliation, arbitration, negotiation, ministerial processes, and summary jury trials, that span from informal to formal procedures.[12]

One of the most significant benefits of ADR is the potential to repair the fractured relationships between disputing parties.[13] This avenue is exceptionally private, allowing the parties concerned complete control over the resolution process.[14] ADR has become a cornerstone in addressing environmental concerns by offering a nuanced and adaptable approach to conflict resolution.[15] Nevertheless, incorporating arbitration in resolving national and international environmental disputes is a changing area within this context.[16] Evaluating the utility and establishing a path forward is imperative to investigate the current practices, efficacy, and future potential of arbitration in these disputes.[17]

Objectives

- To analyze environmental disputes resolution through the lens of Arbitration.
- To evaluate arbitration practices at the international levels.
- To examine how the PCA and other international instruments implement arbitration procedures.
- To assess how arbitral institutions resolve environmental disputes.
- To examine the legal development of environmental legislations in particular jurisdictions, such as India, and its conformity to international standards.

Deciphering India's Environmental Legal Progression

The history of environmental legislation in India is a remarkable tale of change and continuity, dating back to the British colonial era. Nevertheless, the 'historic United Nations Conference on the Human Environment in Stockholm' in 1972 catalysed the movement to establish a comprehensive environmental framework.[18] The establishment of the "National Council for Environmental Policy and Planning" within the Department of Science and Technology resulted from this transformative event in 1972.[19] After this, the council went through a dramatic change, becoming the "Ministry of Environment and Forests (MoEF)" in 1985, firmly establishing itself as the top administrative entity responsible for environmental regulation and preservation in the country.[20] Following the Stockholm Conference, the 42nd Constitutional Amendment in 1976 was a significant milestone in the progression of constitutional endorsement of environmental concerns.[21] This revolutionary change strengthened environmental protection by including it within the Fundamental Rights & Duties and the Directive Principles of State Policy of the Constitution of India.[22] These constitutional amendments openly declared India's unwavering dedication to protecting and improving the environment, marking a critical juncture in the nation's legislative development.[23]

Numerous substantive laws in India have been in place and are relevant to prevent or regulate activities that can potentially contribute to environmental degradation. The following legislative acts are noteworthy: 'Shore Nuisance (Bombay and Kolaba) Act, 1853, The Indian Penal Code, 1860, The Indian Easements Act, 1882, The Fisheries Act, 1897, The Factories Act, 1897, The Bengal Smoke Nuisance Act, 1905, The Bombay Smoke Nuisance Act, 1912, The Elephant's Preservation Act, 1879, Wild Birds and Animals Protection Act, 1912.'[24]

India's Progression Beyond Independence

India has made substantial progress in environmental governance since achieving independence. This progress began with the establishment of the National Council for Environmental Policy and Planning in 1972, which was renamed the MoEF in 1985.[25] In 1992, the MoEF introduced vital policies: the 'National Conservation Strategy & Policy Statement on Environment and Development and the Policy Statement for Abatement of Pollution'.[26] These policies served as the foundation for the 'Environmental Action Programme' in 1993. The initiative aimed to enhance environmental services and integrate ecological considerations into development plans. 'The Water (Prevention and Control of Pollution) Acts of 1974 and 1977, the Air (Prevention and Control of Pollution) Act of 1981, the Atomic Energy Act of 1982, and the Motor Vehicles Act of 1988' comprise India's comprehensive environmental legislative framework.[27] Supported by other statutes such as the National Environment Appellate Authority Act of 1997 and the Public Liability Insurance Act of 1991, the Environment (Protection) Act of 1986 is a fundamental component of India's environmental laws, demonstrating a proactive approach to environmental conservation.[28]

The Indian Constitution enshrines environmental protection: Article 21 ensures a healthy environment, Article 48A directs the state to safeguard it, and Article 51A requires citizens to preserve it.[29] The Supreme Court enforces these provisions, applying principles like Polluter Pays and the Precautionary Principle.[30] The National Green Tribunal (NGT), established under the National Green Tribunal Act of 2010, expedites the adjudication and resolution of environmental disputes.[31] The NGT, which operates independently of traditional civil procedures, seeks to adjudicate cases within six months and emphasises natural justice.[32] Its circuit-based system in key cities of India intends to improve access to environmental justice throughout India. This institution is a significant milestone in India's legal framework, as it is dedicated to the rapid and expert resolution of environmental issues, thereby emphasising the nation's dedication to ecological stewardship and sustainable development.

The Alignment of Arbitration with Environmental Disputes: A Closer Examination of Compatibility and Relevance

India's environmental protection system is enhanced by several constitutional and statutory measures, with strong support from the court and the NGT, both of which play essential roles in environmental jurisprudence.[33] Nevertheless, obstacles impede its efficacy. There needs to be more enforcement of court rulings and gaps in their execution, which diminishes the influence of complete policies. In addition, the legal system needs to gain the specialised knowledge necessary to address complicated environmental challenges, and legal loopholes exacerbate the system's weaknesses.[34] The Courts' overflowing caseloads prevent them from concentrating on pressing environmental matters that need prompt resolutions.[35] The NGT cannot handle a wider variety of environmental issues despite its specialisation because of its authority over a restricted number of laws. Furthermore, the tribunal's judgements occasionally rely on antiquated legal principles, and the need for more diversity in its bench composition can result in limited perspectives.[36] These matters underscore the need to enhance judicial capacity, legislative clarity, and legal expertise to strengthen environmental protection.

The NGT in India cannot comprehensively address environmental issues due to its significant understaffing. In addition to the politically influenced appointments in bodies such as the Central and State Pollution Control Boards, this deficiency must improve its efficacy.[37] There are limits on who can file an appeal, limiting these boards' quasi-judicial powers. The current legislative framework must be revised to completely resolve the environmental challenges arising from India's industrial expansion. To effectively address environmental concerns, it is necessary to establish an independent, multi-specialty organisation. Contractual relationships are frequently subject to disputes regarding indemnities and liability allocations in commercial contexts, as strict liability provisions in environmental laws complicate the situation.[38]

Arbitration provides a practical solution for resolving disputes in India's commercial sector, particularly concerning environmental elements. Parties can establish a transparent, efficient mechanism for addressing conflicts by incorporating arbitration clauses into contracts, which is consistent with the changing nature of commercial practices.[39]Arbitration may not be appropriate for all environmental disputes; however, it is an effective method for resolving contractual and commercial disputes that involve environmental components.[40]Arbitration's efficiency and adaptability are its greatest assets. Parties can select arbitrators with extensive knowledge and experience in environmental topics. It ensures that even the most complicated issues are understood and handled effectively. It is essential in cases where environmental devastation may have irreversible repercussions, as the process is speedier than traditional litigation. Arbitration is a critically important instrument in the transition to a more environmentally conscious economy, as it enables opportune interventions, such as interim measures, to prevent further damage.[41]

The process maintains a balance between transparency and confidentiality, protecting sensitive information while addressing public interest concerns. It is optimal for resolving intricate and sensitive environmental law matters due to its confidentiality, efficiency, and adaptability. Arbitration is suitable for diverse disputes, including those with intricate environmental components, due to its adaptability. Customisation of the procedural rules and the selection of arbitrators is a feature of arbitration that guarantees the application of pertinent expertise and the streamlining of the process. Environment-related disputes are particularly attractive due to the confidential nature of arbitration proceedings, which safeguards sensitive information.[42]

Mandatory Arbitration under International Environmental Agreements

Numerous international environmental agreements lay out a specific protocol for dispute resolution. Unilateral submission of the dispute to arbitration at the behest of one party involved is an ordinary course of action when arbitration or mediation is unsuccessful in resolving the dispute. This practice is evident in numerous treaties.[43] For instance, the 'United Nations Convention on the Law of the Sea, 1982 (UNCLOS),' presents a nuanced viewpoint. Within this framework, parties are afforded the option to designate arbitration as a mandatory avenue for dispute resolution. Moreover, it specifies that arbitration is inherently implied in cases where a signatory to UNCLOS still needs to submit a declaration approving a specific dispute resolution mechanism.[44] Similarly, the 'Convention for the Protection of the Marine Environment of the North-East Atlantic, 1992,' focused on protecting the marine environment of the North-East Atlantic, incorporates a process where, if the dispute cannot be resolved through conciliation, any involved party can prompt arbitration. The convention meticulously lays out the structure of the arbitral tribunal and the procedural roadmap it must adhere to.[45] These agreements not only highlight the importance of dispute resolution in environmental matters but also emphasise the structured approach these treaties take in dealing with such complex issues.

Mandatory Arbitration in Commercial Contracts

Environmental disputes often unfold between governments and significant carbon emitters, typically stemming from official investigations. However, less frequently acknowledged are disputes featuring an environmental dimension within contractual and commercial agreements among parties. Arbitration, offering a flexible and internationally adaptable process, provides the advantage of appointing arbitrators, thereby forming a tribunal well-versed in the intricate regulatory and technical facets inherent in environment-related disputes. These conflicts, often rooted in the realms of energy and construction, are safeguarded by confidentiality clauses due to their sensitive nature.[46] The enactment of the "Paris Agreement on Climate Change" in 2015 marked a leading juncture, prompting states to extend environmental disclosure and precautionary duties to commercial entities. Failure to comply with these obligations could lead to contractual breaches, thereby rendering parties accountable for arbitrating such disputes. Moreover, instances of breaching commercial obligations due to force majeure events, coupled with causing operational harm to claimants due to contributions to climate change, are foreseeable catalysts for environment-related arbitration cases.[47]

Optional Arbitration under International Environmental Agreements

Certain treaties afford ratifying parties the freedom to decide whether to engage in compulsory arbitration to resolve disputes. These treaties present alternative options, allowing the state parties to actively choose their preferred mechanism for resolving disputes. The administrative process established under the treaty requires notice of the preferred dispute resolution method.[48] Several significant treaties exemplify this flexible approach.

"Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973 (CITES) and the Convention on Conservation of Migratory Species of Wild Animals, 1979": After initial unsuccessful discussions, arbitration is only permissible under these treaties if both parties consent. Unilateral referrals to arbitration are prohibited.[49]

"The Vienna Convention on Protection of the Ozone Layer, 1985 (under which the Montreal Protocol, 1992, was adopted)": Parties determine whether to submit disputes to Arbitration, ICJ or both at the time of ratification. Arbitration is optional, and parties may opt for other resolution means.[50]

"Convention on Biodiversity, 2002": In its Article 27, this treaty outlines arbitration as an optional mechanism, providing detailed procedures in Annexure II.[51]

"The Helsinki Convention on the Trans-Boundary Effects of Industrial Accidents, 1992": Similar to the aforementioned conventions, both parties retain the option to refer disputes to arbitration if negotiation settlement fails.[52] These treaties underscore the significance of providing options for dispute resolution mechanisms, enabling parties to tailor their approach based on their preferences and the nature of the disputes.

State Practice on Arbitration

The shifting landscape of dispute resolution has seen a remarkable tilt toward ad hoc arbitration as the preferred choice over resorting to established institutions such as the PCA. It was observed that one key driver for this shift is the vested interest states have in a process they have consented to, particularly in having a say in the selection of an arbitral panel.[53] The Trail Smelter Arbitration, a landmark episode between the US and Canada, set the stage for grappling with cross-border environmental harm and the resulting international responsibility.[54] Influential cases, including the 'Bering Sea Fur Seals and the Lake Lanoux case', have substantially influenced the evolution of International Environmental Law. The former involved enforcing conservancy measures beyond national boundaries, while the latter pertained to proposed alterations to a river's course for a hydroelectricity project.[55]

In more contemporary times, the utility and necessity of arbitration in environmental disputes are evident in cases like the 'Southern Bluefin Tuna disputes'.[56] and the 'MOX Plant dispute' under the UNCLOS 1982's annex VII provisions.[57] The 'Southern Bluefin Tuna case' sparked tensions between 'Australia, New Zealand, and Japan' concerning Japan's experimental fishing Program, which posed a considerable threat to the 'Southern Bluefin tuna' population.[58] Environmental concerns regarding a nuclear reprocessing facility on the Irish Sea shores precipitated legal proceedings before the ITLOS and the PCA in the 'MOX Plant dispute'.[59] Significantly, these cases extended beyond the scope of UNCLOS, necessitating involvement with additional international instruments, thereby complicating matters of jurisdiction.

The Strategic Evolution of Arbitral Institutions: Initiatives Undertaken to Integrate Environmental Conflicts

Permanent Court of Arbitration (PCA)

The Hague Convention of 1899 (HC), marking the advent of the PCA, stands as a pioneering international institution for the resolution and administration of global disputes via arbitration.[60] It not only facilitates arbitration within its framework but extends its support to arbitration beyond its institutional boundaries. A significant illustration of its efficacy lies in the 'North Atlantic Coast Fisheries case'[61], a cross-border conflict between the USA and the UK. This dispute emerged from a special agreement inked in Washington, granting US inhabitants rights akin to British subjects for fishing in specific coastal areas of Newfoundland and Labrador.[62] The tribunal's interpretation of Article I of the HC and its examination of environmental disputes

highlighted the pivotal role of the PCA in achieving a resolution. Another recent instance, involving the Netherlands and France, underscores the PCA's involvement in disputes arising from environmental treaties.[63] The Rhine Chlorides Arbitration centred on an accounting conflict regarding the costs owed by France in an agreement aimed at reducing chloride salt deposits in the River Rhine, with Alsace playing a role in this cooperative effort.[64]

PCA Optional Rules for the Arbitration of Environmental Disputes, 2001 (PCAORAED, 2001)

The PCA established the 'Optional Rules for Arbitration of Disputes Relating to Natural Resources and/or the Environment' in 2001 to resolve the distinctive challenges of environmental disputes. These rules, approved by 94 member states, attempted to provide a specific framework in these situations.[65] However, the current international legal frameworks are primarily concerned with state-centric disputes, which marginalise Non-State Actors (NSAs), such as NGOs, who are instrumental in environmental advocacy. These entities generally cannot directly access international tribunals such as the ICJ or the WTO's Dispute Settlement Process, as these forums typically only take cases involving states. The traditional two-party adversarial model must effectively address the intricacies of environmental disputes, which frequently involve numerous stakeholders with contradictory interests[66] This model's rigidity does not account for the multifaceted character of these conflicts. The PCA's rules address these concerns by removing the requirement to categorise a conflict as 'environmental or natural resource-related' as long as all parties agree to arbitration under these rules.[67] This method facilitates a more efficient and effective resolution process by avoiding protracted debates over definitions and focusing on the substantive issues.

It outlines the jurisdiction of the tribunal by addressing critical gaps in resolving environmental conflicts. This clarity ensures that a tribunal can define its jurisdiction in conformity with the principles of lex specialis derogate legi generali and Kompetenz-Kompetenz.[68] This adaptability enables the tribunal to resolve jurisdictional objections as a preliminary matter or in the final award, thereby balancing procedural efficiency and comprehensive adjudication. These rules represent a substantial advance in integrating non-state actors, including private entities and NGOs, into the dispute resolution process, thereby addressing environmental disputes' intricate and transboundary nature. The rules prioritise inclusivity, rendering arbitration accessible to private entities, individuals, and international organisations in addition to states and international organisations. This method adheres to 'Principle 10 of the Rio Declaration', encouraging the engagement of all parties impacted by environmental issues.[69] Additionally, these regulations permit states to waive the necessity of exhausting local remedies, thereby expediting the dispute-resolution process. This waiver enhances accessibility and effectiveness by bringing all parties into a single forum, facilitating a more efficient resolution. These rules are a ground-breaking endeavour to establish a more inclusive and efficient framework for resolving environmental disputes.

It underscore their ability to manage multi-party arbitrations, which is essential in resolving intricate environmental disputes[70] These mechanisms encourage collaboration among parties, enabling the resolution of shared costs and the inclusion of private entities in the arbitration process through environmental regulations. This arrangement challenges the conventional notion of arbitration as a last resort by providing an efficient and expeditious preliminary option for resolving disputes. Arbitration is well-suited for the complex and diverse nature of multi-party disputes due to its procedural flexibility, which positions it as a proactive mechanism rather than a fallback. These rules provide a versatile framework pertinent to various legal contexts, including agreements, contracts, and treaties based on the 'Principles of Adaptability and Party Autonomy'. Article 1(1) permits all disputing parties to incorporate these rules through formal agreements or mutual assent. This flexibility is further underscored by Article 3(3)(c), which delineates the criteria for arbitration notification, thereby bolstering the rules' broad applicability and efficacy in dispute resolution.[70] This inclusive and adaptable approach guarantees that arbitration can effectively resolve the intricacies of environmental disputes that involve numerous stakeholders.

It provide flexibility by enabling parties to invoke arbitration through a submission agreement post-

dispute, even without a pre-existing arbitration clause. This pragmatic approach guarantees that disputes can be resolved through arbitration, demonstrating the rules' adaptability even after they have occurred. Introducing dual panels for arbitrators and experts is a significant procedural innovation that allows parties to select a tribunal with the requisite expertise to address intricate environmental issues. This system guarantees that the most appropriate expertise is accessible and enhances efficiency. The dual panel method consists of an expert panel and an arbitrator panel. Parties may choose arbitrators; if they choose not to, an appointing authority will select them. The arbitrators subsequently assemble a team of experts capable of exhaustively addressing environmental issues. In response to charges that current tribunals lack the requisite knowledge, which was shown in the 1997 ICJ ruling on the Gabcikovo-Nagymaros Project,[72] when environmental concerns were disregarded since environmental experts were not present.

The rules also facilitate the expedited resolution of disputes by reducing the timeframes for submissions and appointments. It is suggested that each party give a short overview of the technical problems, which helps the processes go more quickly. In order to safeguard sensitive information and ensure accountability, the rules prioritise confidentiality, notably in Article 15(4)-(6). It is important to note that Article 26 allows tribunals to impose interim measures consistent with the 'Precautionary Principle' outlined in 'Principle 15 of the Rio Declaration'.[73] This provision underscores PCAORAED, 2001 proactive approach to environmental protection by enabling tribunals to take immediate action to prevent imminent or irreversible environmental damage. Some challenges persist, which may affect the efficacy of these regulations in resolving environmental disputes despite their strengths.

The absence of mandatory jurisdiction in the PCAORAED, 2001 is a significant drawback, as it necessitates that parties consent to arbitration voluntarily. The absence of compulsion can impede the resolution of international environmental disputes. The PCA's jurisdiction is contingent upon the parties' assent, even though it is cost-effective, with the United Nations covering specific expenses. Sands and MacKenzie propose that states could incorporate PCA arbitration clauses into multilateral treaties to improve their functionality.[74] This inclusion could simplify dispute resolution; however, the necessity for mutual agreement in certain treaties continues to be an obstruction. The financial constraints of the PCA present significant obstacles for NSAs, such as NGOs and civil society organisations, in accessing the arbitration process. The PCA's financial aid, restricted to member countries recognised as aid recipients by the OECD, must adequately resolve these expenses, resulting in an unequal playing field. Another obstacle is the enforcement of interim measures that are intended to prevent environmental damage during disputes. The enforcement of these interim orders needs to be more consistent across jurisdictions, as the New York Convention does not explicitly address them.[75] This discrepancy can undermine the arbitration process's efficacy in resolving pressing environmental concerns.

Arbitral tribunals are granted substantial discretion in allocating costs among parties under the PCA Environmental Rules, which may render arbitration more appealing to resolve international environmental disputes. This adaptability is especially advantageous in cross-border environmental disputes, which frequently involve intricate issues such as the allocation of water rights, international drainage basins, and freshwater resources.[76] Typically, these disputes are complex and sensitive as a result of the conflicting interests of each state. Although international water law principles are well-established, their interpretations could be more consistent, resulting in non-uniform applications. The failure of long-standing multilateral water treaties underscores the challenge of establishing agreements. States have traditionally favoured bilateral talks or non-binding techniques like mediation, which are subject to power dynamics or lack the technical expertise necessary for comprehensive solutions. These methods frequently fail to effectively resolve disputes, requiring states to devise solutions without guidance.[77] These above mentioned challenges highlight the complexity and intricacies surrounding trans-boundary freshwater disputes, underscoring the need for effective and robust mechanisms, such as those embedded in the PCA Environmental Rules, to navigate and address these intricate and sensitive environmental issues.

The resolution of Inter-state Trans-boundary Freshwater Disputes (TFDs) through Arbitration under the PCA Rules

Interstate arbitration emerges as an advantageous recourse for addressing TFDs, meeting the parties quest for swift, practical, and efficient resolution. These disputes, inherently complex and multi-dimensional, often hinge on factors beyond legal frameworks, making arbitration a pragmatic approach in navigating their intricacies. The PCA Environmental Rules present a unique and standalone framework, offering an appealing feature: applicability independent of a specific treaty or convention. This distinctiveness is particularly attractive for TFDs, which commonly arise in scenarios lacking pre-established water allocation agreements. The rules amalgamate the permanence and credibility of the PCA with the adaptable nature of arbitration. In a landscape where states are disinclined to create new forums for environmental disputes, the PCA, coupled with these rules, stands as a fitting alternative for resolving TFDs.[78] However, to effectively address TFDs, the rules require tailoring, given the atypical nature of these disputes, often disconnected from international agreements or conventions. Several key adjustments should be considered.

1. Confidentiality needs recalibration in the context of TFDs. While sensitive information necessitates protection, a rigid presumption of confidentiality contradicts the trend favouring transparent decision-making in environmental disputes. Adhering to the precedents established by the 'ITLOS and WTO Dispute Resolution Procedures', transparency can be enhanced by the public's access to arbitral awards issued by arbitration tribunals constituted under the PCA.
2. Regarding tribunal composition, while the PCA boasts arbitrators specialised in environmental disputes, inclusion of a technical expert seems prudent. Drawing from the Indus Waters Treaty's mandate for a highly qualified engineer on the arbitral tribunal, incorporating technical expertise aligns with the intricacies of TFDs.[79]
3. The provision for amicus curiae within the rules holds potential significance in resolving TFDs. Engaging non-state actors through amicus briefs aids in comprehensively assessing stakeholder needs and interests, benefiting from insights of those most impacted by the outcome. Customising the rules to allow limited third-party participation on specific issues and facts could enhance the resolution process for TFDs.
4. Effective involvement of diverse stakeholders is significant in accounting for local water use customs and practices. Restricting access to arbitral documents to accredited third parties can facilitate meaningful participation, ensuring the incorporation of essential local perspectives into the dispute resolution process for TFDs.

Adapting the PCA Environmental Rules to the unique context of TFDs holds promise in not only addressing the complexity of these disputes but also in aligning the dispute resolution framework with the specific intricacies and needs of trans-boundary freshwater disputes.

American Arbitration Association

In the landscape of arbitration, various institutions have undertaken substantial adaptations to incorporate environmental concerns into their dispute resolution frameworks. Notably, while the American Arbitration Association has not established distinct regulations exclusively tailored to environmental disputes, it has categorically included such issues within the scope of Construction and Real Estate disputes. Specifically, it addresses disputes emanating from industrial projects that impact the environment, providing a dedicated platform for resolving these conflicts. Moreover, it extends its support to parties engaged in complex multi-party and multi-jurisdictional arbitrations, underscoring its commitment to addressing environmental issues in a diverse and expansive manner.

International Chamber of Commerce (ICC)

In 2019, the ICC made a significant stride forward by establishing a task force to study the significant role of ADR in resolving international disputes associated with the intricate field of climate change.[80] The comprehensive report that ensued categorised climate change disputes into three distinct sections: General Commercial Contracts, Contracts formulated in alignment with the Paris Agreement,

and Submission Agreements invoked subsequent to disputes arising within affected groups.[81] Notably, the Report delineated six fundamental procedural guidelines crucial for parties to consider for the optimisation of arbitration proceedings in this domain:

1. The selection of arbitrators and experts should follow appropriate scientific methods.
2. Address imperative interim relief promptly.
3. Integrate pertinent laws and climate change obligations into the case.
4. Maintaining transparency throughout the arbitration proceedings.
5. Facilitating third-party involvement when necessary.
6. Carefully distributing costs to promote fairness and efficiency in the proceedings.

International Bar Association (IBA)

In addition to arbitration institutions, independent bodies such as the IBA have played a significant role. They issued a task force to establish a nexus between 'human rights and climate change'. In particular, the IBA gave London residents a model law to empower them to question their government's failures to deal with climate change responsibilities. This provision enables citizens to request a judicial assessment of the government's strategies for addressing climate change.[82] These proactive steps taken by a multitude of institutions and organisations stand as integral ventures, fostering a balanced and fair platform for multiple stakeholders entangled in intricate environmental disputes. Such initiatives not only pave the way for equitable resolutions but also underscore the core role of arbitration in addressing complex environmental issues.[83]

The Evolution of Environmental-related Claims through Arbitration: What Lies Ahead

Exploring the landscape of environmental disputes within the realm of arbitration mandates a critical examination of the potential adverse impacts arbitration processes might impose on the environment. A comprehensive study by Dechert LLP underscored a striking revelation, revealing that the carbon emissions produced by a single medium-sized arbitration equate to a staggering 418,531 kg CO_2 e, a figure that translates to the planting of approximately 20,000 trees to offset its environmental impact.[84] This analysis factored in various contributors such as extensive travel, printing of hearing materials, courier services, and accommodations, underscoring the substantial carbon footprint generated, a figure that does not even encompass ad hoc arbitrations.

However, amidst these environmental concerns, the emergence of the COVID-19 pandemic introduced a silver lining in the form of virtual arbitration hearings. The arbitration community readily embraced this shift to virtual proceedings, even conducting intricate processes online. This adaptation holds immense promise in mitigating the environmental footprint of arbitration. Maintaining this virtual trajectory beyond the pandemic presents a viable solution, substantially reducing the necessity for extensive travel and site visits. The integration of new technological advancements facilitates remote participation, rendering geographic boundaries irrelevant in arbitration proceedings. The arbitration community holds the power to significantly alleviate concerns surrounding carbon emissions. Despite the concerns, it is evident that arbitration for Environment-related disputes carries immense potential and is poised to emerge as a viable and effective mechanism in the foreseeable future.

Suggestions/Recommendations

- India should strengthen its legal frameworks by explicitly incorporating provisions for environmental arbitration. To do this, environmental laws and arbitration laws should be changed to recognise environmental disputes as separate types of conflict and handle them with the unique details and difficulties they involve.
- It will benefit India to establish or designate specialised arbitral institutions concentrating on environmental disputes. These institutions should have access to specialists in environmental law, science, and technology, which would improve the credibility and efficacy of the arbitration process.
- Increasing the expertise of judges, arbitrators, and legal experts in environmental law ensures that they are prepared to manage the particular difficulties environmental conflicts present. It would be possible to set up regular seminars and training programs.
- India can incorporate and modify international arbitration norms, such as the PCAORAED, 2001 to meet its domestic requirements.

This adaptation has the potential to simplify procedures and guarantee compliance with international standards.

- It should be a government priority to advocate for the advantages of arbitration in resolving environmental disputes. More emphasis should be given to arbitration's capacity to expedite decisions, deal with intricate scientific evidence, and use specialised knowledge.
- In keeping with international trends, India must encourage "Green Arbitration" procedures, which consider ways to reduce the carbon footprint of arbitration hearings, which could entail implementing remote proceedings, digital documentation, and other environmentally favourable strategies.
- Cooperation among governmental agencies, commercial enterprises, and NGOs may aid in creating a solid foundation for environmental arbitration, which could encompass the exchange of best practices, research, and collaborative initiatives.
- It is essential to increase public awareness and industry understanding about the availability and advantages of environmental arbitration, which could entail the development of public campaigns, distributing informational materials, and organising seminars to enlighten potential users of their rights and options.
- Implementing mechanisms to monitor the efficacy of environmental arbitration and evaluate outcomes can offer valuable feedback to encourage continuous improvement, encompassing the acquisition of data regarding cases, participant satisfaction, and the influence of environmental protection rulings.
- Lastly, it is critical to have strong legislative and policy backing, which encompasses not only the legal recognition of environmental arbitration but also the guarantee that environmental laws are conducive to arbitration processes and that the outcomes are enforceable.

Conclusion

There is a patchwork of processes regarding settling environmental disputes in India. Developing an environmentally cognisant economic framework in the nation has resulted in a complex legal environment due to the intersection of private and public stakeholders. Arbitration has become a pivotal, flexible mechanism for resolving these disputes, frequently involving international agreements, commercial contracts, and investment treaties.

The dynamic nature of environmental disputes requires a flexible and evolving arbitration framework. A growing consensus among Indian stakeholders is emerging regarding aligning the country's arbitration practices with global standards. In India, the proactive stance of arbitral institutions and self-regulated organisations suggests a willingness to accept the escalating demands of environmental arbitration, particularly relevant given the rise in environmental legislation and the issues associated with international accords such as the Paris Agreement.

In order to confront these changing obstacles and capitalise on the opportunities, India must establish a robust legal framework that explicitly endorses environmental arbitration, which entails the establishment of specialised arbitral institutions with expertise in environmental law and science, implementing "Green Arbitration" practices to reduce environmental impacts, and enhancing public awareness and engagement in these processes. In order to establish India as a global arbitration hub, it is imperative to expand the scope of arbitration to include environmental disputes. In order to enhance India's leadership and relevance in the international arbitration arena, this expansion is not only a pragmatic decision but also a strategic necessity. By addressing these challenges and capitalising on the opportunities, India has the potential to substantially impact the future trajectory of environmental arbitration, both domestically and globally.

Acknowledgement

The authors greatly acknowledge the Dean, School of Law, Dean (Research) and Management of SRM Institute of Science and Technology, Kattankulathur (KTR) for the support rendered for the completion of the original review article.

Funding Sources
The author(s) received no financial support for the research, authorship, and/or publication of this review article.

Conflict of Interest
The authors declare no conflict of interest.

Data Availability Statement
All data underlying the results are available as part of the article and no additional source data are required.

Ethics Statement
Ethical review and approval were not required for the present review.

Authors' Contribution
All the authors involved in reviewing and preparing the content for the review article.

References

1. Percival RV, Schroeder CH, Miller AS, Leape JP. Environmental Regulation: Law, Science, and Policy [Connected eBook with Study Centre]. Aspen Publishing; 2021.
2. Gill GN, Ramachandran G. Sustainability transformations, environmental rule of law and the Indian judiciary: connecting the dots through climate change litigation. *Environ Law Rev.* 2021;23(3):228-247.
3. Rosenbaum WA. Environmental Politics and Policy. CQ Press; 2016.
4. Méndez M. Climate Change from the Streets: How Conflict and Collaboration Strengthen the Environmental Justice Movement. *Yale University Press;* 2020.
5. Klijn AM, Gupta J, Nijboer A. Privatising environmental resources: the need for supervision of Clean Development Mechanism contracts? Rev Eur Community Int Environ Law. 2009;18(2):172-184.
6. Stephens T. International Courts and Environmental Protection. Vol. 62. Cambridge University Press; 2009.
7. Mishra A. Alternative Dispute Resolution vs Litigation-A Comparative Analysis. *Jus Corpus LJ*. 2021;2:25.
8. Sander FE. Alternative methods of dispute resolution: an overview. U. Fla. L. Rev. 1985;37:1.
9. Gill C, Williams J, Brennan C, Hirst C. Models of alternative dispute resolution (ADR). A report for the Legal Ombudsman. Queen Margaret University; 2014. Available from: [https://www.legalombudsman.org.uk/media/he4bmjpx/models-alternative-dispute-resolution-report-141031.pdf]
10. Weidner H. Alternative dispute resolution in environmental conflicts-promises, problems, practical experience. In: Alternative dispute resolution in environmental conflicts: experiences in 12 countries. Berlin: *Edition Sigma*; 1998. pp. 11-55.
11. McGuinness HMJC. Alternative Dispute Resolution-Mediation and Conciliation. 2016.
12. Goss J. An introduction to alternative dispute resolution. *Alta. L. Rev.* 1995;34:1.
13. Blake S, Browne J, Sime S. A Practical Approach to Alternative Dispute Resolution. Oxford University Press; 2016.
14. Abdullah NC. Going Green in Urbanisation Area: Environmental alternative dispute resolution as an option. *Procedia-Social and Behavioural Sciences.* 2015;170:401-408.
15. Ryan M. Alternative dispute resolution in environmental cases: Friend or foe? *Tulane Environmental Law Journal.* 1997;10(2):397-414.
16. Siegel JA. Alternative dispute resolution in environmental enforcement cases: A call for enhanced assessment and greater use. *Pace Envtl. L. Rev.* 2007;24:187.
17. Paglia E. The Swedish initiative and the 1972 Stockholm Conference: the decisive role of science diplomacy in the emergence of global environmental governance. *Humanities and Social Sciences Communications*. 2021;8(1):1-10.
18. Vig NJ, Kraft ME, eds. Environmental Policy: New Directions for the Twenty-First Century. 8th ed. Sage; 2012.

19. Varadarajan DB, Chitra M. Environmental Policy: An Overview. Economics. 2023;11(2):28-37.
20. Umashankar S. Evolution of Environmental Policy and Law in India. Available at SSRN 2508852. 2014.
21. Kohli K, Menon M. Development of Environment Laws in India. Cambridge University Press; 2022.
22. Ahmad F. Origin and growth of environmental law in India. *Journal of the Indian Law Institute.* 2001;43(3):358-387.
23. Sati E. Evolution of Environment Laws in India. Supremo Amicus. 2019;11:158.
24. Kohli K, Menon M. Development of Environment Laws in India. *Cambridge University Press*; 2022.
25. Ramakrishna K. The emergence of environmental law in the developing countries: a case study of India. *Ecol Law Q.* 1984;12:907.
26. Bhal K. Environmental legislation and its implementation in India. In: Proceedings of the 2nd International Conference on Management, Leadership and Governance: ICMLG. 2014:43.
27. Jain R, Upadhyaya N, Sharma R, Upadhyaya R. Environmental policies, laws, and legislations in India. *Int J Adv Sci Res Manag.* 2019.
28. Rao P. Constitutional perspective of Indian environmental laws. *Res J Humanit Soc Sci.* 2017;8(2):177-182.
29. Sahu G. Implications of Indian Supreme Court's innovations for environmental jurisprudence. *Law Environ Dev J.* 2008;4:1.
30. Gill G. Environmental Justice in India: *The National Green Tribunal. Routledge*; 2016.
31. Amirante D. Environmental courts in comparative perspective: preliminary reflections on the National Green Tribunal of India. *Pace Environ Law Rev.* 2011;29:441.
32. Patra SK, Krishna VV. National Green Tribunal and environmental justice in India.
33. Rao NV, Bhaskaran V, Nagendra H. Can green tribunals help to resist neo-liberalism in environmental governance–The case of India. *Land Use Policy.* 2023;131:106739.
34. Saxena S, Narain S. Environment Courts in India: Improving Access to Justice. *En't L. & Soc'y J.* 2015;3:25.
35. Harigovind PC, Rakesh PS. Anatomisation of the Recent Trends in the Role of NGT in Fostering Sustainability and Environmental Justice in India: Challenges and Implications. *Asian Journal of Environment & Ecology.* 2023;22(1):40-51.
36. ChungyalChungyalpa W. Examination and analysis of the central pollution control board and the state pollution control board-indian administrative arm for environmental protection. *Indian Journal of Sustainable Development.* 2020;6(1):11.
37. Niyati M. Judicial activism for environment protection in India. *International Research Journal of Social Sciences.* 2015;4(4):7-14.
38. Pandya FA, Bharad BH. A Study on Applicability of Alternate Dispute Resolution Mechanisms for the Resolution of Environmental Disputes in India. GNLU JL Dev. & Pol. 2023;13:95.
39. Behn D, Fauchald OK. Adjudicating Environmental Disputes Through Investment Treaty Arbitration: An Introduction. *The Journal of World Investment & Trade*. 2017;18(1):9-13.
40. Ansari AH, Ahmad MHB, Omoola S. Alternative Dispute Resolution in Environmental and Natural Resource Disputes. *Journal of the Indian Law Institute.* 2017;59(1):26-56.
41. Deb LK, Raj P. Arbitration strategies for resolving climate change and sustainability disputes in commercial transactions. *Indian Rev Int'l Arb.* 2023;3:10.
42. Sands PJ, MacKenzie R. Guidelines for Negotiating and Drafting Dispute Settlement Clauses for International Environmental Agreements. *International Bureau of the Permanent Court of Arbitration*; 1998.
43. Jensen Ø, Bankes N. Compulsory and binding dispute resolution under the United Nations Convention on the law of the sea: Introduction. *Ocean Development & International Law.* 2017;48(3-4):209-215.
44. Wong MS. The Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention") (and Annexes I, II, III, IV). In: Elgar Encyclopaedia of Environmental Law. *Edward Elgar Publishing;* 2017:189-198.
45. Miles WJ, Swan NK. Climate change and dispute resolution. Disp. *Resol. Int'l.* 2017;11:117.
46. de Paor R. Climate Change and Arbitration: Annex Time before there won't be A Next Time. *Journal of International Dispute Settlement.*

2017;8(1):179-215.
47. Matisoff DC. Are international environmental agreements enforceable? implications for institutional design. International Environmental Agreements: Politics, *Law and Economics.* 2010;10:165-186.
48. Franckx E. The relationship between CITES, FAO and related agreements: Legal issues. FAO Fisheries and Aquaculture Circular. 2011;(C1062)
49. United Nations Environment Programme. Ozone Secretariat. Handbook for the International Treaties for the Protection of the Ozone Layer: The Vienna Convention (1985), the Montreal Protocol (1987). UNEP/Earth print; 2003.
50. Bragdon S, Garforth K, Haapala JE. Safeguarding biodiversity: the convention on biological diversity (CBD). In: The Future Control of Food. *Routledge*; 2012:82-114.
51. Ma J, Hipel KW, De M, Cai J. Transboundary water policies: assessment, comparison and enhancement. *Water Resour Manage.* 2008;22:1069-1087.
52. Rusakova EP. Environmental disputes resolution by the conciliation of the Permanent Court of Arbitration (PCA). *Вопросы российского и международного права.* 2013;(2):100-108.
53. Kuokkanen T. Settling International Environmental Disputes through Arbitration: The Trail Smelter Case. In: *International Law and the Environment. Brill Nijhoff*; 2002:80-93.
54. Sands P. Litigating environmental disputes: courts, tribunals and the progressive development of international environmental law. In: Law of the Sea, *Environmental Law and Settlement of Disputes. Brill Nijhoff*; 2007:313-325.
55. Foster CE. The "Real Dispute" in the Southern Bluefin Tuna Case: A Scientific Dispute?. *Int J Mar Coast Law.* 2001;16(4):571-601.
56. Röben V. The Order of the UNCLOS Annex VII Arbitral Tribunal to Suspend Proceedings in the Case of the MOX Plant at Sellafield: How Much Jurisdictional Subsidiarity?. *Nordic J Int Law.* 2004;73(2):223-245.
57. Kwiatkowska B. The Australia and New Zealand v Japan Southern Bluefin Tuna (jurisdiction and admissibility) award of the first law of the sea convention annex VII arbitral tribunal. *Int J Mar Coast Law.* 2001;16(2):239-293.
58. Bodansky D. The OSPAR arbitration of the MOX plant dispute. *UGA Legal Studies Research Paper*. 2008;(08-002).
59. Wu CQ. A Unified Forum-The New Arbitration Rules for Environmental Disputes under the Permanent Court of Arbitration. *Chi J Int'l L.* 2002;3:263.
60. Permanent Court of Arbitration. North Atlantic Coast Fisheries Arbitration at the Hague: Oral Argument Before the Tribunal Constituted Under an Agreement Signed at Washington on the 27th Day of January, 1909, Between His Britannic Majesty and the United States of America. Printed at the Foreign Office by Harrison and Sons; 1910.
61. Kuokkanen T. International law and the environment: variations on a theme. Vol. 4. Brill; 2002.
62. Salman SM. International water disputes: A new breed of claims, claimants, and settlement institutions. *Water International.* 2006;31(1):2-11.
63. Dieperink C. International water negotiations under asymmetry, Lessons from the Rhine chlorides dispute settlement (1931–2004). International Environmental Agreements: Politics, Law and Economics. 2011;11:139-157.
64. Ratliff DP. *The PCA optional rules for arbitration of disputes relating to natural resources and/or the environment. Leiden Journal of International Law.* 2001;14(4):887-896.
65. Jahangiri A. Dispute Settlement Mechanisms in International Environmental Law: With Particular Reference to the ICJ, PCA, WTO Dispute Settlement System and the World Bank Inspection Panel. *The University of Manchester (United Kingdom)*; 2006.
66. Permanent Court of Arbitration. Optional Rules for Arbitration of Disputes Relating to Natural Resources and/or the Environment. 2001. Art 1(1). Available from: https://pca-cpa.org/wp-content/uploads/sites/175/2016/01/Optional-Rules-for-Arbitration-of-Disputes-Relating-to-the-E.
67. Rest A. Enhanced Implementation of International Environmental Treaties by Judiciary-Access to Justice in International Environmental Law for Individuals and NGOs: Efficacious Enforcement by the Permanent Court of Arbitration. *Macquarie J Int'l Comp Envtl L*. 2004;1:1.

68. Bhardwaj C, Agarwal A. Science-intensive dispute mechanism for protection of atmosphere: ICJ, WTO and PCA. *Indian J Glob Leg Stud*. 2022;29:147.
69. Wu CQ. A unified forum? The new arbitration rules for environmental disputes under the Permanent Court of Arbitration. *Chi J Int'l L.* 2002;3:263.
70. Vespa M. An alternative to an international environmental court: the PCA's optional arbitration rules for natural resources and/or the environment. *Law Pract Int'l Cts Tribunals.* 2003;2:295.
71. Nakamichi M. The International Court of Justice Decision Regarding the Gabcikovo-Nagymaros Project. *Fordham Envtl LJ*. 1997;9:337.
72. de Sadeleer N. The principles of prevention and precaution in international law: two sides of the same coin? In: Research Handbook on International Environmental Law. *Edward Elgar Publishing*; 2021:151-187.
73. Sands PJ, MacKenzie R. Guidelines for Negotiating and Drafting Dispute Settlement Clauses for International Environmental Agreements. *International Bureau of the Permanent Court of Arbitration*; 1998.
74. Indlekofer M. International Arbitration and the Permanent Court of Arbitration. Vol 27. *Kluwer Law International* BV; 2013.
75. Meshel T. The Evolution of Interstate Arbitration and the Peaceful Resolution of Transboundary Freshwater Disputes. *J Disp Resol.* 2016:361.
76. Kaufman E, Oppenheimer J, Wolf AT, Dinar A. Transboundary fresh water disputes and conflict resolution: *Planning an integrated approach. Water International.* 1997;22(1):37-48.
77. Meshel T. International law and transboundary fresh water resources: A dispute resolution perspective [dissertation]. *Toronto (Canada): University of Toronto*; 2018.
78. Robins TE. Defusing Hydroelectric Brinkmanship: The Indus Waters Treaty's Alternative Dispute Resolution Provisions and Their Role in the Tenuous Peace Between India and Pakistan. *Arbitration Law Review.* 2013;5(1):389-408.
79. Craig WL, Park WW, Paulsson J. International chamber of commerce arbitration. Vol 3. New York: *Oceana Publications;* 1990.
80. Derains Y. International Chamber of Commerce Arbitration. Pace L. Rev. 1984;5:591.
81. Ball M. Probity deconstructed: How helpful, really, are the New International Bar Association guidelines on conflicts of interest in international arbitration? *Arbitration International.* 2005;21(3):323-342.
82. Joelson MR. A Critique of the 2014 International Bar Association Guidelines on Conflicts of Interest in International Arbitration. *Am Rev Int Arbitr.* 2015;26(3):483-492.
83. Greenwood L, Duggal KAN. The Green Pledge: No Talk, More Action. Kluwer Arbitration Blog. Published March 20, 2020. Available from: https://arbitrationblog.kluwerarbitration.com/2020/03/20/the-green-pledge-no-talk-more-action/?print=print.