The Alternative Dispute Resolution: Tribunal Secretaries, Emergency Arbitrators in India in the Arbitration process, Environmental ADR and use of Artificial Intelligence (AI) Technology for the protection of environment and Health

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Abstract: The Arbitration process resolves the dispute amicably between the litigant parties who are agreed mutually to settle the legal conflicts by the Arbitral Tribunal which conducts the proceedings by complying the provisions of law. The disputing parties may prefer to settle the legal issues voluntarily through arbitration process for early as disposal of case without delay and the decision is binding on the conflicting parties. The Arbitral Tribunal is also known as Arbitration Tribunal, Arbitration Council, Arbitration Committee or Arbitration Commission. The *Arbitration and Conciliation Act, 1996 (enforceable with effect from 22.08.1996)* [1] covers the arbitration law and it includes the provisions as contained in Arbitration Act, 1940, the Arbitration (Protocol and Convention) Act, 1937 and the Foreign Awards (Recognition and Enforcement) Act, 1961.The process of arbitration is also international issues. The Law Commission of India have proposed amendments to the Act. As felt the economic reforms that has been undertaken by the Country will be more effective for settlement of both domestic and international commercial disputes. The Emergency Arbitrators in India has been recognised and also allowed award passed by the Arbitrators. The Supreme Court has also approved the validity, recognition and enforcement of awards passed by an Emergency Arbitrator under the Arbitration and Conciliation Act, 1996 although there is no express of statutory recognition. The Supreme Court has emphasised on party's autonomy to follow the rules of the institution for providing for an Emergency Arbitrator and the awards/orders passed by the Emergency Arbitrator is within the purview of Arbitration and Conciliation Act, 1996 as amended. In the Indian context the Supreme Court has taken a progressive step for India's position may be as international hub for resolving commercial disputes and arbitrations. The role of emergency arbitration in providing swift relief and its evolving practice in the context of India and where foreign arbitration institutions like Singapore International Arbitration Centre (SIAC), London Court of International Arbitration (LCIA) and the Hong Kong International Arbitration Centre (HKIAC) and Indian institutions like MCIA, International Chamber of Commerce (ICA), and ICADR have incorporated emergency arbitration provision. The ADR method and use of Artificial Intelligence AI

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technology for the protection of environment is another important factor which is also discussed in this paper.

1. Introduction*:* The process of Arbitration is widely accepted now a days to settle the dispute mutually with an award by the Arbitrator which is agreed to the litigant parties and the matter closes there. The arbitration process is non-judicial in nature and a better option some times which is much speedier method as compared to the adjudication by the courts the confidentiality and better control over arbitration process makes it more desirable for the parties to refer dispute before an arbitrator. The powers of the arbitrator to interpret the terms of the contract and decide the issues before it, are larger than the powers of the trial courts while deciding the contract related disputes. The important reasons for providing such extra powers include, the non-requirement of legal qualifications for an arbitrator and to respect finality to the arbitration awards. The use of Artificial Intelligence (AI) in the protection of environment for maintaining quality life and health is also studied. The Govt. of India has enacted the *Jan Vishwas (Amendment of Provisions) Act, 2023* [10] wherein the imprisonment provision has been relaxed with penalty for initial violation treating as minor offence. The appointment of Adjudicating Officer to decide the quantum of penalty in the environmental offence is the new area in coming days which can be correlated with Alternative Dispute Resolution (ADR) method of dispute settlement.

2. Research hypothesis: The doctrinal method of research is adhered to in this research paper so as to conclude the utility of ADR method of dispute settlement with engagement of Tribunal Secretaries to conduct the proceedings by furnishing relevant records before the Arbitrators for final award and also subject matter on emergency arbitration in India and also at international forum.

(i) A study has been made to ascertain the engagement and role of Tribunal Secretaries for the effective function of Arbitral Tribunal from the start of proceedings to the end till award is decided.

(ii) The use of ADR method for the dispute settlement in Environmental disputes and the success thereof.

(iii) The role of Artificial Intelligence (AI) in the matter of environment protection and its importance.

3. Literature review and Case studies: Courts in India have been consistently recognizing the authority of the arbitrators to interpret the contract and decide the issues pending before them (*Singh T & Sajwan M, 2020*) [30]. The breach of contract is the most important factor for the cause of conflict or litigation. As decided by Hon'ble Supreme Court of India in the matter of "*McDermott International Inc vrs. Burn Standard Co Ltd.,"* (2006) [15] it has been directed that the interpretation of a contract is a matter for arbitrator to decide as per the provisions of law. It is also clarified that since contract can be express or implied, the arbitrator cannot be said to have misdirected himself in passing the award by taking into consideration the conduct of parties. The arbitrator has to consider the type of contract, communications made between the parties, nature and scope of the arbitration agreement and the conduct of the parties while determining the contract entered in to. It also reconfirmed that once it is held that the arbitrator had the jurisdiction, no further question shall be raised and the court will not interfere in the award unless it is found that there exists any bar on the face of the award. It is also a point to discuss that the arbitrator cannot go beyond the terms and conditions of contract as per the provisions of Indian Contract Act, 1872. The proceedings to be conducted with the assistance of tribunal Secretary and the mutual consent is the basis of the final award and the justification is also to be stated. The court usually will not interfere in the award, but can be challenged in case the Arbitrator has exceeded his power while taking decision which is not existing in the original contract.

The case details of McDermott, Dubai, UAE (2006) as a leading matter is discussed, which is a dispute on the contract made by Oil and Natural Gas Commission (ONGC) on oil exploration in Bombay high region during 1974 who has appointed contractors to fulfil substantial portions of its off-shore construction requirements. *Burn Standard Company Limited (BSCL)* was interested in the second stage of platform construction of ONGC, i.e., structural and progress fabrication and material procurement. Four contracts were thereafter awarded in favour of BSCL for fabrication, transportation and installation of six platforms. The said contract contains arbitration agreements. *BSCL and Mcdermott International Inc. (MII)* entered into Technical Collaboration Agreement on 25.09.1984 in terms whereof the latter agreed *to transfer technology to the former* with regard to design, construction and operation

of a fabrication yard. The agreement contains a separate arbitration clause between the parties. However, with regard to the fabrication and installation of off-shore platforms, BSCL decided to give a sub-contract of the work to MII on a project by project basis. The contract was made for fabrication process of offshore platforms, transportation about 01.01.1986. The work under the said agreement was to be completed within 24 months in all respect it was completed in early 1989. The terms of contract were signed in an agreement. BSCL while retained the job of fabrication of the ED and EE decks, six helidecks and procurement of materials for the overall project other than pipeline materials and some process equipment which was issued by ONGC sub-contracted the remaining work. Disputes and differences having arisen between the parties, MII invoked the arbitration clause by a legal notice dated 10.04.1989. *Before the Arbitrator, apart from the aforementioned amount, interest on the outstanding amount was also claimed at the rate of 15% per annum on all claims for which invoices were not paid until the award, as well as interest from 21st August, 1989 and future interest at the rate of fifteen per cent. BSCL filed counter statements as also counter-claims before the learned Arbitrator*. The proceeding started with invocation of arbitration clause before Calcutta High Court. Two arbitrators for determination of the disputes and differences between the parties. The arbitrators who were earlier appointed were removed and Mr. Justice A.N. Sen, a retired Judge of this Court was appointed as a sole arbitrator. It is stated that Mr. Justice A.N. Sen declined to act as an Arbitrator and by an order dated 28th August, 1998, Mr. Justice R.S. Pathak, retired Chief Justice of India was appointed by this Court as a sole arbitrator and the award to be decided.

The MII has claimed a sum of (i) US$ 128,000.00 as contended in paragraph 4.29 of the Statement of Claim has not been dealt with and has been omitted from the Award (ii) Regarding Corporate Income Tax, MII's claim that BSCL should be liable to the tax authorities for all further liabilities for Indian Corporate Income Tax as may be assessed in respect of the income received by MII under the Sub-contract as also for all tax liabilities that may be assessed in respect of any Award in favour of MII in the present arbitration proceedings as contained in the Statement of Claim has not been dealt with and has been omitted from the Award (iii) Corporate Income Tax as decided, MII has claimed two amounts one of US$ 804,789.36 being interest @15% per annum up to 29 February, 1992 paid by MII in respect of Corporate Income Tax liability to the Tax authority, and the other on account of principal amount of tax payment of US$ 1,623,048.00. In the award, the learned Arbitrator has in respect of the principal claim allowed an amount of US$ 1,573,466.00 on account of Corporate Income Tax and an amount of US$ 512,187.16 by way of interest. MII has also claimed interest on these two amounts from

29 February 1992 till payment. This claim for interest has not been dealt with in the Award and has been omitted from the Award. MII's claim for interest on amounts paid but paid late as contained in paragraphs 5.1 and 5.2 has not been dealt with and has been omitted from the Award.

BSCL filed an application under Section 34 of the Act questioning the said partial award dated 9th June, 2003 as also the additional award dated 29th September, 2003. The learned Arbitrator rejected the BSCL's objection in regard to the maintainability of the said proceeding stating that the same can be a subject matter for determination of jurisdictional question in a proceeding under Section 33 of the 1996 Act. The *final award* passed by the Arbitrator that (i) towards transportation of pipes (point No. 6) awarded MII entitled US$ 919,194.32 against BSCL, transportation from Mangalore to Mumbai (ii) Relating to Change of orders (point No. 8) and extra work, the learned Arbitrator awarded MII US$ 305,840.00 as regards Change Order No. 1. As regards Change Order No. 6, MII was awarded US$72,000.00 against BSCL. Furthermore, in respect of Change Order No. 9, MII was awarded US$ 300,000.00 against BSCL. As regards Extra Work, MII was awarded US$ 4,870,290.96 against BSCL pursuant to the invoices covered under the said point whereas MII's claim for US $637,473.00 was rejected (iii) As far as delay and disruptions MII was awarded US$ 574,000.00 against BSCL in respect of Change Order No. 2. MII was further awarded US$1,271,820.00 and US$355,000.00 against BSCL under Change Order Nos. 3 and 7 respectively. As regards increased cost and expenditure incurred by MII, it was awarded US$8,973,031.00. As far as claim towards interest order has been passed that MII is entitled to interest on the amounts awarded under various heads by Final Award. Having regard to the circumstances of the case, a rate of interest *at 10 percent per annum will be appropriate from the date on which the amount fell due for payment to the date of this Final Award*. The awarded amount including interest shall bear the interest at the same rate from the date of this Final Award to the date of the payment by BSCL. The learned arbitrator also awarded US$750,000.00 as costs of the arbitration. The matter has been challenged by BSCL under section 34 of the Act praying for setting aside the final award.

Before the Supreme Court it has been argued that the arbitrator had no jurisdiction to make a partial award which is not postulated under the 1996 Act and the award is impermissible in law. All the relevant factors including award was placed before the Hon'ble Supreme Court of India including *section 55 of the Indian Contract Act*. As reflected in the order which says that "the 1996 Act provides for award of 18% interest. The arbitrator in his wisdom has granted 10% interest both for the principal amount as also for the interim. By reason of the award,

interest was awarded on the principal amount. An interest thereon was up to the date of award as also the future interest at the rate of 18% per annum." However, in some cases, this Court was resorted to exercise its jurisdiction under **Article 142** in order to do complete justice between the parties. The court referred that in the assessment of damages, the court must consider only strict legal obligations, and not the expectations, however reasonable, of one contractor that the other will do something that he has assumed no legal obligation to do "*M.N. Gangappa vrs. Atmakur Nagabhushanam Setty & Co. and Another (1973)* [18]". The calculation formula was taken in to consideration as referred in Emden formula, Hudson formula and Eichley formula. The court said that computation depends on circumstances and methods to compute damage, how the quantum thereof should be determined is a matter which would fall for the decision of the arbitrator. We, however, see no reason to interfere with that part of the award in view of the fact that the aforementioned formula evolved over the years, is accepted internationally and, therefore, cannot be said to be wholly contrary to the provisions of the Indian law. The Emden formula has been used for calculation of award. The objection raised by BSCL that learned arbitrator acted illegally and without jurisdiction in adopting the AISC Code. The matter on fabrication, refurbishing, transportation, prices, pipelines, terms and conditions of contract, terms of payment, delivery was referred and as observed that there is some delay in payment by BSCL but the court considered the exchange rate shall cease to have no application because of the breaches on the part of BSCL, cannot be accepted. As far as interest rate is concerned the Arbitration Act, 1996 it specifies award of 10 % interest for both the principal amount including interim award. Further the interest was awarded on the principal amount. An interest thereon was up to the date of award as also the future interest at the rate of 18% per annum. However, in some cases, this Court was resorted to exercise its jurisdiction under *Article 142* in order to do complete justice between the parties. The Supreme court has referred the earlier decisions as decided towards the rate of interest as 6 % in case of "*Pure Helium India* (p) Ltd. vrs. *Oil and Natural Gas Commission (2003)* [25]" and 7.5 % in case of "*Mukand Ltd. vrs. Hindustan Petroleum Corporation, (2006)* [20]". Thus, the court awarded at a reduced rate of interest of 7 % as reasonable rate that is to be paid by the appellant to the Respondent for the period subsequent to the decree in view of the long lapse of time. The award by the ld. Arbitrator has been modified and the matter was decided with no order as to costs.

4. Tribunal Secretary: The increasing trend of international arbitration and the professionalisation of arbitrators has led to an appointment of Tribunal Secretaries.

International arbitration is moving towards a prominent role for Tribunal Secretaries and it has become a common practice in international arbitration to use Tribunal Secretaries to support the Arbitral Tribunal. The Secretary helps for the arbitrations process which are to be conducted efficiently and effectively with Arbitral Secretaries taking away much of the administrative burden from Tribunal. The Arbitral Tribunal Secretary has to assist the Tribunal in drafting certain parts of the award and provide general attendance to the Tribunal's deliberations. Proper use of Arbitral Secretaries can be beneficial to all. However, improper use of Arbitral Secretaries can have an adverse effect. International arbitrations have been faced with challenges of award based on misuse of Tribunal Secretaries. The Tribunal Secretary may be a junior lawyer who works at the same law firm as the chair of the Arbitral tribunal or the sole arbitrator (*Nancy Manyara CPA, 2022*) [21]. The International Centre for Dispute resolution (ICDR) has issued guidelines on the use of Arbitral Tribunal Secretaries stating that "*The tribunal may, with the consent of the parties, appoint an arbitral tribunal secretary, who will serve in accordance with the ICDR guidelines".* The guidelines have the advantage of providing greater process, practice and policy detail as well as allowing broader adoption and use of the Guidelines in cases governed by different rules. The ICDR also upon receipt of feedback decided to enhance transparency in three key areas: (1) the decision-making control of the parties; (2) the role and duties of the tribunal secretary; and (3) financial considerations. The parameters for the Tribunal Secretary and role is specified that, (i) The Tribunal Secretary has no decision-making authority (ii) The Tribunal Secretary's role does not duplicate or replace the responsibilities of the Administrator (iii) The Tribunal Secretary may assist the arbitral tribunal with such tasks as scheduling and coordinating hearings, research, preparing and disseminating correspondence, and preparing documents for the arbitral tribunal's review and approval, including drafting factual or procedural histories, summaries of parties' positions and procedural orders and (iv) The Tribunal Secretary works under the supervision of, and may be dismissed by, the arbitral tribunal. The tribunal secretary has to submit clear detailed invoices showing the specific amount of time and the nature of the work performed. All billing and invoicing guidelines applicable to arbitrators also apply to any tribunal secretary. Fundamentally, the use of a tribunal secretary should increase the efficiency and economy of the case with tasks being performed by the tribunal secretary at a lower cost than tasks being performed by the tribunal (*Robertson AR, et. al. 2022*) [27].

The United Nations Commission on International Trade Law (UNCITRAL) has adopted the UNCITRAL Model Law on International Commercial Arbitration in 1985. The UNCITRAL Conciliation Rules in 1980 was made effective. The United Nations Commission on International Trade Law (UNCITRAL) adopted the first edition of the notes on organizing Arbitral Proceedings at its twenty-ninth session, in 1996 and the second edition of notes was finalised on 49th session in 2016. The representatives from the states and international organisations participated in the deliberation and from the 60 member States. The purpose of the notes is to list and briefly describe matters relevant to the organisation of arbitral proceedings. The arbitration is a flexible process to resolve disputes; the parties are free to agree on the procedure to be followed by the arbitral tribunal in conducting the arbitral proceedings, subject to mandatory provisions of the applicable arbitration law. The autonomy of the parties in determining the procedure is of special importance in international arbitration. It allows the parties to select and tailor the procedure according to their specific wishes and needs, unimpeded by possibly conflicting legal practices and traditions.

The judges appointed in the Arbitral Tribunal are the learned Judges as Experts having special knowledge of law on dispute resolution and settlement which is to be made through negotiations between the conflicting parties. There may be a sole Arbitrator or more number representing the parties who are independent and neutral in decision making process. The Rule 6 of The Arbitration and Conciliation Act, 1996 for Administrative Assistance made provision of "Administrative Assistance" to facilitate the conduct of the arbitral proceedings, the parties or the Arbitral Tribunal with the consent of the parties may arrange for assistance by a suitable institution or person. There is provision of engagement of Tribunal Secretary having person with adequate knowledge of law for placing the records for decision and to act in a neutral manner without interfering the process of arbitration. The role of Tribunal Secretary is to do the administrative work and to manage records of Tribunal's, prepares note for placing before the Tribunal conducting legal research, drafting and reviewing procedural documents, drafting parts of an award, organizing procedural meetings and evidentiary hearings, and attending the Tribunal's deliberations. As reported necessary guidelines have been framed on the role of Arbitral Secretaries in international arbitration. The London Court of International Arbitration (LCIA) updated Notes for Arbitrators (the LCIA note 2017); Young International Council for Commercial Arbitration (Young ICCA) guidelines on Arbitral Secretaries (The ICCA report No. 1); Hong Kong International Arbitration Centre HKIAC guidelines to the use of a Secretary to the Arbitral Tribunal as stated to be effective 01.06.2014. The Tribunal Secretary has the

responsibility to coordinate with members for conducting the meetings and mostly all official work is assigned to him, record the proceedings and to maintain the confidentiality of proceedings and the hearing process. The Hong Kong International Arbitration Centre (HKIAC) has released a report on the use of its Tribunal Secretary Service an initiative that was introduced in June 2014 and allows all HKIAC legal counsel to be appointed as tribunal secretary in HKIAC-administered and ad hoc arbitrations seated in or outside of Hong Kong (4HKIAC news report 03.09.2018).

5. Emergency Arbitration: In a dispute the interim relief awarded is an important provision in the matter of Arbitration which safeguards the interest of the parties. The International Chamber of Commerce (ICC) in 1990 was the first arbitral institution to offer pre-arbitral emergency measures that permitted parties to submit disputes for, amongst other things, an EA order. The ICC recognised that during the course of many contracts, particularly long-term contracts, issues might arise that require urgent responses. In such limited time, it is frequently not possible to arrive at a binding decision from a tribunal or a court. Accordingly, the ICC incorporated a pre-arbitral referee procedure in order to provide a temporary resolution to the dispute and lay the foundation for its final settlement. Such provisions were optional, and parties were required to 'opt-in' in order to be bound by them (Pre-Arbitral Referee Procedure, 1999). This provision is allowed as an emergency award by the Arbitrator before the formation of Arbitral Tribunal. In the process of EA proceeding, it costs in terms of money, value and risk, which urges parties to seek emergency relief due to its urgent and quick nature. In certain cases where the issues relate to several jurisdictions, applications may have to be made to multiple courts in several different countries. However, this can be simply avoided by approaching a Tribunal for interim relief where only one application will have to be made (*Nikolaus Pitkowitz & Alice Fremuth Wolf, 2018*) [23].

As can be seen, the emergence of Emergency Arbitrator is a fairly recent phenomenon which has found favour with most prominent arbitration institutions around the globe, due to the ability to provide immediate and efficient interim relief to parties to an arbitration agreement prior to the constitution of the arbitral tribunal. While certain shortcomings of an Emergency Arbitrator can be experienced on a case-to-case basis (such as, non-binding effect on third parties, non-availability of an ex-parte relief), there is no doubt that the concept of Emergency Arbitrator addresses various issues that are associated with approaching national

courts, in cases where a party is desirous of obtaining interim reliefs on an urgent basis (*Shetty, R. 2022*) [28].

The 246th Law Commission of India has recommended amendment of provisions on arbitration (August 2014). Under the Arbitration and Conciliation Act, 1996 parties can seek temporary remedies from both the arbitral tribunal and national courts. However, the arbitral tribunal is often not utilized for immediate relief since it cannot provide remedies before its formation. To fill this gap, institutions have introduced emergency arbitration procedures that allow for expedited requests for immediate relief from an emergency arbitrator. According to Section 17(2) of the Arbitration Act, decisions made by an emergency arbitrator in arbitrations with an Indian seat are enforceable as court orders. This establishes that an emergency arbitrator's ruling is legally equivalent to a decision made by the arbitral tribunal under Section 17(1). However, in cases with a foreign seat, enforcement of an emergency arbitrator's ruling requires reliance on Section 9 of the Arbitration Act. The emergency arbitration and the interim measures provided by the judiciary both are have the different purpose. Where the emergency arbitration award is used as first thing while the judiciary is the last resource. If the party is not agreed for emergency arbitration in the institutional set up then to be adjudicated by the Court. The award is considered to be as injunction order and it is to be enforced by the court. As reported sometimes the judicial intervention is required in the arbitration process to safeguard the interest of the weaker party (*Krishan P & Panwar Dr. P.S., 2024*) [12]. In an article published by *Gupta Abhinav & Neogi Sriroopa (2021*) [8] titled as "Emergency Arbitration in India: A Critical Appraisal of the Institutional framework" the efficient dispute resolution mechanism which can improve contract enforcement and the ease of doing business in Emergency arbitration (EA) is discussed as an effective resolution mechanism. The EA mechanism is based on four founding principles, which are the likelihood of success on merits, the risk of irreparable harm, the risk of the aggravation of the dispute, and the balance of equities (ICC report of ICC Commission, 2021). Due to the aforesaid important goals and functions that EA serves, it is frequently referred to as the 'Achilles' heel' of arbitration. In the dispute of "*Amazon* vrs. *Future Retail* (Amazon)" (2021) [4] the concept of EA has an important decision in the legal system in India. This may be due to the core principles of arbitration, such as party autonomy, that is dealt with in the case, as well as the popularity of the parties involved. These challenges range from recognition to the enforcement of EA orders with respect to both foreign and domestic seated arbitration. In the said research paper they has analysed the institutional rules of seven domestic arbitral institutions, namely the Mumbai

Centre for International Arbitration (MCIA), the New Delhi International Arbitration Centre (NDIAC), the Indian Council of Arbitration (ICA), the Madras High Court Arbitration Centre (MHCAC), the Nani Palkhivala Arbitration Centre (NPAC), the Bangalore International Mediation, Arbitration and Conciliation Centre (BIMACC) and the Indian Institute of Arbitration and Mediation (IIAM). The EA due to its objective and purpose forms a core element of an *effective arbitration regime for the expedited nature of proceedings* with the proper duties, powers of the emergency arbitrator and the Tribunal, the rights of the parties, and the interim nature of the EA order etc. The Amazon judgement is a landmark one in the field of international commercial arbitration, not in India but for jurisdictions across the globe. The striking feature of the decision is the dynamic, purposive, contextual and constructive interpretation of the existing provisions of the Arbitration Act to recognize the award of an Emergency Arbitrator in the absence of an express statutory framework of the law. The Supreme Court through this decision has upheld the fundamental principle of party autonomy while at the same time acknowledging the efficiency of Arbitral Tribunals (including Emergency Arbitrators) to grant urgent interim reliefs in appropriate cases. While the decision is certainly revolutionary in terms of its importance for global arbitration practice, the relatively recent phenomenon of Emergency Arbitrator still poses a host of issues that need to be identified, debated and addressed. It has been concluded that the concept of Emergency Arbitrator is acceptable at all level in the Indian legal/commercial ecosystem.

6. Environmental ADR: The matter of climate change arbitration in environmental law is also of great significance in the international issues and in Kenya the related disputes are also studied. The issue of climate change in the field of environment is directly related to the economy of the states and more issues like survival of the mankind due to increases of temperature globally up to 1.5^0 C. The matter of sustainable development concept is to protect the environment and the agenda for Sustainable Development Goals (SDG) as per the United Nations 2030 agenda is also to be addressed. As reported in Kenya the Environment and Land Court Act, 2011 provides for the jurisdiction of the Environment and Land Court as including power to hear and determine disputes relating to climate issues (*Muigua Kariuki, 2022, NCIA Jr. 2*) [19]. It has been *argued that arbitration has certain advantages over litigation which makes it more viable in addressing the disputes in question.* It has been reported that the Kenya's Climate Change Act, 2016 does not make reference to the use of ADR mechanisms, including arbitration in addressing disputes that arise therefrom. However, it makes reference

to Environment and Land Court Act 2011 (ELC Act) which empowers Environment and Land Court to hear and determine disputes relating to climate issues. The ELC Act, however, gives these courts the power to resort to ADR mechanisms. There is a need for policy makers and other stakeholders to borrow a leaf from the PCA Environmental Rules and the recommendations from the 2019 ICC Task Force Report to consider coming up with special rules and panel of experts that may either address disputes requiring specialized knowledge such as those relating to climate change or those who may offer specialized guidance to courts while dealing with these disputes. Arbitral institutions such as Chartered Institute of Arbitrators and Nairobi Centre for International Arbitration, among others, should also be left behind in building specialized capacity along the same lines. Climate change related disputes are unlikely to go away in the near future and stakeholders should, therefore, prepare adequately. The Article 14.1 of 1992 "*United Nations Framework Convention on Climate Change (UNFCC)"* [32] *has provision that in* case of a dispute between two or more Parties concerning the interpretation or application of the Convention, the Parties concerned should seek a settlement of the matter by discussion or any other peaceful measures of their own choice. Article 14.2(b) states that the use of arbitration is to be in accordance with procedures to be adopted by the Conference of the Parties as soon as practicable in an annex on arbitration. Article 19 of "*Kyoto Protocol"* also provides that "the provisions of Article 14 of the Convention on settlement of disputes shall apply mutatis mutandis to this Protocol. Similarly, Article 24 of the "*Paris Agreement*" a legally binding international treaty which entered into force on 4 November 2016, provides that "the provisions of Article 14 of the Convention on settlement of disputes shall apply to this Agreement. The settlement of disputes also requires specialised knowledge and may be of transnational in nature with an outcome.

The Alternative Dispute Resolution (ADR) has been implemented in Australia in environmental law for cost effective dispute resolution (*Deborah Lockhart & Christian Santos, 2019*) [6]. It is an area of law that provides the frameworks and tools for responding to challenges posed by climate change, loss of biodiversity, pollution, use and exploitation of natural resources, and planning for sustainable cities. By its very nature, environmental law can have wide-ranging effects on the interests of individuals, communities, and nations. This adds to the complexity and challenge of resolving disputes in this area. As concluded in this research paper the Environmental lawyers will be staying alert to new developments and opportunities for ADR in what is one of the most interesting and relevant areas of law now a days.

The ADR in the enforcement of environmental cases has been studied by *Siegel J.A. (2007)* [29]. In United States the ADR movement has started from 1970 onwards and dealt issues on labour and international mediation fields. Dispute resolution also can be viewed along a continuum from less formal private decision-making by the disputing parties to highly coercive adjudicatory decisions by third-parties. ADR generally refers to approaches other than the very coercive traditional litigation-focused judicial decision-making process. These alternative processes include mediation, facilitation, arbitration, conciliation, non-binding minitrials, and early neutral evaluation.

The Environmental ADR may be referred as Environmental Conflict Resolution (ECR) are stated to be (1) voluntary participation; (2) the ability of parties to withdraw from the ECR process; (3) direct participation in the process; (4) use of a neutral party with no decision-making authority; and (5) formulation of solutions and outcomes by the parties (*Kirk Emerson et al. 2003*) [11]. Most ECR in the enforcement context has been in the form of mediation wherein a neutral third party (a neutral) assists the disputing parties to resolve their conflict. Such type of cases the neutral usually adopts a facilitative approach. Facilitative mediators do not offer opinions but rather assist the parties to identify their own interests and options and find common solutions. In some cases, though, mediators may use an evaluative style in which the mediator offers opinions about the relative merits of each party's case. Extensive use of ECR in enforcement cases may depend on whether scholars, researchers, and government agencies can collect sufficient amounts of data necessary to conduct empirical studies demonstrating the benefits of ECR. The ECR memorandum is also created to carry out the performance measurement aspects. ECR saves money in transaction costs and resolves disputes more quickly than litigation and both PRPs and EPA attorneys were satisfied with the outcome of ECR compared to previous expectations. Also relevant to cost and time savings, in an address to the Steering Committee of the federal government's Interagency ADR Working Group, the Office of the Attorney General of the United States reported that the Federal Energy Regulatory Commission's use of mediation in electricity and natural gas disputes saves parties on average, $100,000 in avoided costs (*Miles Richard L, 2004*) [17]. It has been reported in one study of nineteen mediated enforcement cases in Florida looked at a variety of environmental enforcement contexts, including dredge and fill, air pollution, domestic waste, hazardous waste, groundwater contamination, and solid waste. The re-searchers found that at least 70% of mediated cases were resolved that participants were either "very" or "moderately"

satisfied with the mediation process, the agreement and the mediator and that they benefited from a median savings of $75,000 per party by using mediation rather than litigation. More recent studies have shown significantly higher rates of resolution with ECR, ranging from 87% to 93%. Some of the studies have shown that Attorneys may be fearful of losing control over their cases during the mediation process. As reported in the study the ECR can provide cost and time savings as well as other benefits. Considering the benefits and the small numbers of reported ECR enforcement cases relative to total enforcement cases the ECR is underutilized in federal environmental enforcement and should be supported to a greater degree. The ECR memorandum can be used to avail the advantage of the present infrastructure, increase on the resources for the ECR to overcome the barriers for more use.

The environmental dispute Resolution, ADR methods and the PCA Arbitration rules was studied by *Garimella Sai Ramani (2016)* [7] which has been published in ILI Law review. As reported little success in the international environmental law regime could be attributed to the absence of clarity in the dispute settlement mechanism and an identified institution for dispute settlement. While the law has evolved in addressing the variety of concerns presented by often immediate and irreversible damage to the human environment, the working of the law has been plagued by an ineffective dispute settlement mechanism with precious little detailing on its administration. International environmental treaties are increasingly making space for alternative dispute resolution (ADR) methods for dispute settlement. The Permanent Court of Arbitration Environment Arbitration Rules, 2001 are a set of rules with a few novel features addressing concerns that are exclusive for environmental disputes, the role of the non-state actors and multi-party disputes. The rules are designed in such a manner that made possible for any combination of parties to a dispute, state, NGOs, multinational corporations and even individuals. The rules are also framed to handle multi-party disputes. The important feature of these rules is that it addresses the costs aspect in international dispute settlement process, member states have access to the environment assistance fund. Permanent Court of Arbitration (PCA) and the environment rules could thus fill the place of the forum for environmental disputes with expertise.

In the matter of "*Red Eagle vrs. Colombia (2024)*" [26] which is a landmark arbitration decision upholding Environmental Protection a decisive award under the Canada-Colombia FTA (2008). This arbitration case (ICSID Case No. ARB/18/13) primarily revolved around Red Eagle's claims of minimum standard of treatment (MST) and expropriation, stemming from Colombia's stringent environmental regulations. The matter is on Colombia's adoption of its

Mining Code in 2001, which laid out conditions for obtaining mining rights, including environmental licenses. Specifically, the code prohibited mining in protected areas, known as "mining exclusion zones," including páramos (high-altitude wetlands). The provision was upheld by the Colombian Constitutional Court in 2002. Red Eagle acquired 11 mining's between 2009 and 2012 to develop a *gold mining* project. However, in 2010 Colombia enacted Law 1382, designating páramos as exclusion zones, but with a grandfathering clause for existing activities. Subsequent laws and court judgments further reinforced this prohibition, impacting Red Eagle's plans as part of its titles overlapped with the Santurban Páramo. Despite the evolving regulatory landscape, Red Eagle did not secure the necessary environmental licenses or Mining Works Program (PTO), which eventually led to the National Mining Agency (ANM) barring mining activities in the affected areas. The party Red Eagle initiated ICSID arbitration in 2018, seeking over *CAD$ 110 million in damages*. The Tribunal ruling was on minimum standard of treatment, legitimate expectations, Transparency in arbitrariness, indirect expropriation was deliberated. In Conclusion it was decided that the Tribunal decided the Colombi's right to implement and enforce environmental protections, particularly in ecologically sensitive areas like paramos. The claim of Red eagle was dismissed and the Tribunal affirmed that Colombia's regulatory actions were consistent with its international obligations and necessary for environmental conservation. This award clarifies the scope of MST under the FTA and sets a precedent for the burden of proof on investors claiming legitimate expectations. The Tribunal emphasized that the MST, rooted in customary international law, did not extend to protecting legitimate expectations beyond a certain threshold.

The ADR as a tool for Environmental Governance has been reported in SCC online by "*Mahasth Harsh and Narain Aadya (*2022)" [14]. Several countries have incorporated alternative dispute resolution mechanisms into tackling environmental disputes. The Environmental Protection Authority (EPA) in the United States strongly supports the use of alternative dispute resolution (ADR) inclusive of, but not limited to "conciliation, facilitation, mediation, fact finding, mini-trials, arbitrations, use of ombuds. Environmental disputes generally involve a diverse range of stakeholders, from private citizens, to Governments, to corporations, and individual organisations. Each hold differing views about what must be prioritised when allocating resources whether it is conservation, development, etc. The United States Congress, in enacting the Negotiated Rule Making Act, 1990, found that traditional rule-

making procedures discourage stakeholders with different interests from communicating with one another, leading to "conflicting and antagonistic positions. The influx of cases in courtrooms across the world, and particularly in an overburdened judiciary in India, make the process of litigation far lengthier. Alongside being unable to curb the pressing environmental concern, it is also an immense drain on time and financial resources. The flexibility of ADR has been a prevailing reason in its recent rise as a means to resolve high-stake disputes. Parties can choose the format and the individuals through which they communicate, increasing the level of trust and commitment to adhering to the eventual outcome. Due to the confidential, relatively informal, and solution-oriented format, parties are able to restore or maintain important relationships. This is particularly vital in environmental disputes, which are likely to recur across many of the common stakeholders repeatedly, all of whom must be in a position to reasonably reach a consensus. A consensus was reached within a year, in a cost-efficient manner, with citizen groups previously overpowered finding a legitimate seat at the bargaining table, a "win" in some or other sphere for each party, and thus led to a sustainable agreement. The principles of ADR have historically permeated inter-governmental organisations such as the United Nations, Association of Southeast Asian Nations (ASEAN), and COP-26, in the process of discourse used to create treaties, guidelines and frameworks, for the determination of both present and potential conflicts. The Paris Climate Change Agreement, 2015 (UNFCC 2015) is evidence of the large-scale success of negotiating a document (*Dani Riya, 2022*) [5] ratified by all participating countries as a commitment to curb and control emissions. Its success was hailed by United Nations Secretary, Ban Ki-moon, as a "monumental triumph for people and our planet". The models and frameworks provided by numerous countries and inter-governmental organisations recognising these merits, should act as an impetus for furthering and institutionalising the use of this method.

7. AI Technology on Environmental impact and health: Artificial Intelligence (AI) is becoming an important tool for improving both the environment and public safety in the United States. It helps the governments, scientists, and health experts make better and quicker decisions that protect people and nature. In the area of environmental health, AI helps design better green spaces like parks and gardens. By studying things like maps, population size, and land use, AI can suggest the best places to plant trees or build new parks. This helps to make cities cooler and more pleasant, especially in areas where heat is a problem. AI can also check the health of plants using sensors, which helps city workers know where maintenance is

needed. AI also plays a big role in monitoring air quality. It can use real-time data from sensors to detect pollution and send alerts to the public. This allows people to avoid unhealthy areas and helps the government take faster action. When it comes to public safety, AI helps in many ways. During natural disasters like floods, fires, or earthquakes, AI can predict where the damage might be worst and guide emergency teams to respond more quickly. It helps with traffic control, planning the fastest and safest routes for ambulances and police. AI systems can also monitor streets and public areas through cameras and sensors to detect unusual or dangerous activity early on. In healthcare, AI helps track and predict the spread of diseases. For example, it can study data to predict when a flu outbreak might happen and help hospitals get ready in advance. AI also watches social media and other online platforms to catch early signs of public health problems. While AI offers many benefits, there are some serious concerns that must be handled carefully. Privacy is one of the biggest issues. AI systems often use large amounts of personal data, so it's important to keep that information safe. There are also worries about fairness. Sometimes, AI can make biased decisions without meaning to, which can hurt certain groups of people. To avoid this, developers must create systems that are fair and transparent, meaning people understand how decisions are made. Another challenge is the lack of clear rules. Technology is growing fast, but laws and regulations are not always keeping up. We need better policies that can guide how AI is used and make sure it’s being used in a responsible way. There should also be training and education for developers and government workers so they understand how to build and use AI ethically. Several real-life examples in the U.S. show how AI is already making a difference. The Environmental Protection Agency (EPA) uses AI to monitor pollution. The Centers for Disease Control and Prevention (CDC) uses it to track disease outbreaks. Cities like New York and San Diego are using AI to save energy and improve transportation systems. Police departments are using AI to predict and prevent crimes. To make the most of AI, it’s important to bring people together, researchers, technical experts, public health officials, and the general public. Everyone should have a voice in how AI is used. Public input ensures that AI is built to serve everyone not just a few. The AI is a powerful tool to make our communities safer, healthier, and stronger. But it must be used with utmost care. With the right rules, collaboration, and ethics, AI can help us build a better future for all. The standardization of guidelines for responsible AI use in *environmental health and public safety* is imperative to safeguard individual rights, privacy, and ensure the ethical deployment of these technologies (*Adefemi A. et. al., 2023*) [2].

The Artificial Intelligence (AI) towards fast growth its broad impact on various sectors need an evaluation of its effect on the accomplishment of the sustainable development goals (SDGs). AI is the biggest influence on the global economy. AI plays a very important role in achieving environmental sustainability- from ending hunger and poverty to achieving sustainable energy and gender equality for the protection and preservation of biodiversity. The SDGs are divided into three categories namely society, economy, and environment. AI finds application in a wide array of environmental sectors, which include natural resource conservation, energy management, wildlife protection, pollution control and agriculture, clean energy, and waste management. AI will support energy systems having low carbon footprint with more energy efficiency, which are required to address climate change. AI can help in managing the complex ecosystem structure and functions effectively. Apart from above-mentioned applications it can also help in identifying desertification trends over large areas, in decision-making and environmental planning. Due to advent of many new technologies, AI can be now implemented in those countries which are having different cultural values and wealth. This has popularized the method all over the world. Advanced AI-based product design, technology, and research may require vast computational resources which can be made available through enormous computing centers. Such facilities require huge energy requirement and have massive carbon footprint. AI-based ecosystem information may cause exploitation of resources, although this kind of misuse has not been reported adequately. The AI development needs to be supported and guarded by the requisite regulatory body. The oversight will result in gaps in safety, transparency, and ethical standards. Today's need is to develop AI which is more eco-friendly not only today but for generations to come (*Neeta Kumari & Soumya Pandey*, 2023) [22].

The "Role of Artificial Intelligence (AI) in carbon cost reduction of firms" has been published by *Tseng Cheng-Jui and Lin Shih-Yen (2024)* [31] on the issue of climate change and global warming. The CO_2 gas accounts for the largest portion of greenhouse gases in and around firms. Artificial intelligence (AI) can have a big impact on reducing the carbon costs of firms. With AI, companies can monitor energy usage across different processes, identify inefficiencies and suggest ways to reduce them. This helps companies improve resource efficiency and costs while minimizing carbon emissions. The research employs a quantitative research design and demonstrates that AI use in decision-making and optimizing renewable energy is highly correlated with carbon cost reduction. The outcomes of the research have

significant practical implications for policymakers, and industry professionals in their development of sustainable business practices. Additionally, the research contributes to the literature surrounding AI and sustainability by offering an empirical perspective on how AI can be used to support environmental sustainability efforts, enhance corporate social responsibility, and promote long-term economic gains for firms. incorporating AI technology into business practices to effectively address sustainability concerns and reduce carbon costs, ultimately promoting long-term economic sustainability and corporate social responsibility.

The use of technology as Artificial Intelligence (AI) for the environmental protection is studied in the research paper of *Dr. Anthoni Yeshudas* titled as "Artificial Intelligence for Environmental Protection" [33]. These technologies provide a variety of functionality and applications in green construction and environmental monitoring including biodiversity, energy, water, transportation, agriculture, and resistance to extreme events. However, it is critical to address the environmental impact of AI, as training AI models can result in large carbon emissions (*Alessandra et. al. 2023*) [3]. AI technologies such as Building Information Model, Machine Learning, Deep Learning, and others are utilized in green building to improve energy efficiency, resource efficiency, and resident comfort and safety measures. The AI plays a transformative role in environmental protection by enabling advanced monitoring, prediction, and optimization across various domains. AI has played a critical role in accomplishing the Sustainable Development Goals (SDGs) by tackling environmental concerns and encouraging biodiversity conservation. In the field of heavy metal pollution, AI has been used to discover contamination sources, assess risk levels, and guide remediation techniques. Since the 1950s, environmental scientists and engineers have used AI methods to solve problems such as weather forecasting, climate estimation, optimization, and image processing. In the field of wildlife conservation, AI technologies such as drones, computer vision, and machine learning are used to track endangered species, detect habitat loss, and combat illegal poaching through pattern recognition and behavioural forecasting. Remote sensing data and species distribution models like Maxent assist in identifying viable habitats for flora and fauna under climate change scenarios. AI also contributes to climate change mitigation by optimizing energy consumption, predicting greenhouse gas emissions, and integrating with renewable energy systems such as solar and wind power. It enhances disaster preparedness through early warning systems for natural calamities like floods and earthquakes, using real-time data from sensors and predictive algorithms. In agriculture, AI-driven precision farming improves crop yields,

manages pests, and minimizes water and fertilizer use, while also supporting waste management through intelligent sorting, recycling, and pollution monitoring with deep learning and IoT devices. The ecosystem modelling is advanced by use of tools like Ecological Reservoir Computing, EcohNet, and MDSINE2, which simulate dynamic ecological interactions and microbiome behaviour using neural networks and Bayesian methods. Moreover, AI supports policy and environmental governance by fostering data-informed, transparent, and participatory decision-making processes. Real-world applications demonstrate AI's ability to address pollution, biodiversity, energy, and resilience challenges effectively. As AI technologies evolve, their continued integration into environmental strategies holds great promise for fostering a more sustainable, resilient, and harmonious relationship between technology and nature. The study of AI technology in the field of environment protection with ultimate aim on maintaining safe and healthy life of human being and overall preservation of ecosystem is a new area of research which is related to Article 21 of the Constitution of India under Right to life and healthy environment as a fundamental right to be enjoyed by all the citizens of the country. Moreover, the excessive use in case found to be detrimental to the environment, the same should be restricted as the human mind cannot be replaced by any other thing which will take a sound decision for the benefit of the mankind.

8. Conclusion: The ADR method of settlement of disputes has now become popular in the sense that the decision is taken through mediation process which is binding on both the parties to settle the matter amicably settled under the supervision Arbitrator. The Arbitral tribunal has important role in deciding the award on dispute settlement. The engagement of Tribunal Secretary to conduct the administrative work, production of records, to function in a neutral manner so as to complete the process from the date of initiation till completion of the award has been essential for smooth functioning of the Arbitral Tribunal. The emergency arbitration is also required to settle the matter and also accepted globally. The climate change litigations as adhered to through international treaties are to be accepted all over the world. The decision of Amazon case (2021) is a leading matter in the international arbitration process and award through ADR method. The Supreme Court through this decision has upheld the fundamental principle of party autonomy while at the same time acknowledging the efficiency of arbitral tribunals (including Emergency Arbitrators) to grant urgent interim reliefs in appropriate cases.

The process of settlement of environmental disputes internationally to be decided in time bound manner keeping the international treaties and most important is climate change issue which hampers globally to all countries. The use of Artificial Intelligence (AI) in the study of environment protection is the new area of research and the pollution can be under control by using the technique. As Right to life and health is covered under Article 21 of the Constitution of India, the environment protection is quite essential basing on the "***Public Trust Doctrine, Sustainable Development, Polluter Pay Principle, Precautionary Principle and Intergenerational Equity***" to have a better quality of life. In the *Jan Vishwas (Amendment of Provisions) Act, 2023*, the provision of appointment of Adjudicating Officer exists who will decide the quantum of penalty instead of earlier provision of punishment of imprisonment for initial violation to end the matter treating as minor offence. The matter of imposing penalty for environmental violation may be correlated with the mechanism of the principle of ADR which will be used frequently in future.

9. References:

[1] The Arbitration and Conciliation Act, 1996 (Effective from 22.08.1996).

[2] Adefemi Adedayo, Emmanuel Adikwu Ukpoju, Oladipo Adekoya, Ayodeji Abatan and Abimbola Oluwatoyin Adegbite (2023) Artificial intelligence in environmental health and public safety: A comprehensive review of USA strategies, World Jr. of Advanced Research and Reviews, 202(3), 1420-1434.

[3] Alessandra Toniato., Oliver, Schilter., Teodoro, Laino. The Role of AI in Driving the Sustainability of the Chemical Industry, Chimia, (2023), doi: 10.2533/chimia.2023.144.

[4] Amazon vrs. Future Retail (Amazon) (2021) SCC OnLine Del 1279.

[5] Dani Riya, "Role of Alternative Dispute Resolution in Environmental Disputes", Via Mediation & Arbitration Centre, accessed on 12-11-2022.

[6] Deborah Lockhart and Christian Santos (2019) Alternative Dispute Resolution in Environmental Disputes. Paper presented in Australian Disputes Centre to the NSW Young Lawyers. Environmental Law Committee's Intensive on 23 March 2019.

[7] Garimella Sai Ramani (2016) Environmental Dispute Resolution, ADR Methods and the PCA Arbitration Rules, ILI Law review, Summer Issue, pp. 200-222.

[8] Gupta Abhinav & Neogi Sriroopa (2021) Emergency Arbitration in India: A Critical Apparaisal of the Institutional Framework, 14 NUJS Law Review, 4

[9] International Chamber of Commerce (2021), *Report of the ICC Commission on Arbitration and ADR Task Force on Emergency Arbitrator Proceedings*, available at

https://library.iccwbo.org/content/dr/COMMISSION_REPORTS/CR_0058.htm, Commission Reports

[10] Jan Vishwas (Amendment of Provisions) Act, 2023.

[11] Kirk Emerson et al., *The Challenges of Environmental Conflict Resolution, in* The Promise and Performance of Environmental Resolution 6 (Rosemary O'Leary & Lisa B. Bingham eds., 2003).

[12] Krishan P. & Dr. Pritam Singh Panwar (2024) Emergency arbitration in India: Current scenario and future. International Journal of Civil Law and Legal Research (IJCLLR) 4 (2):92-97.

[13] Law Commission of India, Amendments to the Arbitration and Conciliation Act 1996, (246th Report) (August, 2014),

[14] Mahasth Harsh and Narain Aadya, SCC online, published in 27.12.2022 as reported by Bhumika Indulia.

[15] McDermott International Inc vrs. Burn Standard Co Ltd., Supreme Court Appeal (Civil) No. 4492 of 1998 (decided 12.05.2006) (2006) 11 SCC 181.

[16] Michelle Ryan (1997) "Alternative Dispute Resolution in Environmental Cases: Friend or Foe?", 10 (2) Tulane Environmental Law Journal 397, accessed on 12-11-2022.

[17] Miles Richard L., Attorney General Declares ADR an Effective Dispute Resolution Mechanism, ALTERNATIVE Disp. RESOL. COMMITTEE NEWSL. (Am. Bar Association, Section of Env't, Energy, & Res.), Oct. 2004, at 4-5.

[18] M.N. Gangappa vrs. Atmakur Nagabhushanam Setty & Co. and Another (1973) 3 SCC 406.

[19] Muigua Kariuki (2022) The viability of Arbitration in Management of Climate Change related Disputes in Kenya, Nairobi Centre for International Arbitration (NCIA) Journal, Vol. 2, No. 1, pp. 119-128, ISBN No. 978-9914-40-777-8.

[20] Mukand Ltd. vrs. Hindustan Petroleum Corporation, (2006) 4 SCALE 453.2: AIR 2007 SC (SUPP) 1914: 2006 (9) SCC 383.

[21] Nancy Manyara CPA (2022) with the guidance of senior Annemarie Grosshans: The role of Arbitral Tribunal Secretary, Nairobi Centre for International Arbitration (NCIA) Journal, Vol. 2, No. 1, pp. 29-41, ISBN No. 978-9914-40-777-8.

[22] Neeta Kumari & Soumya Pandey (2023) Application of artificial intelligence in environmental sustainability and climate change, Chapter 14, pp. 293-316, Elsevier, Visualisation techniques for Climate Change with machine learning and Artificial Intelligence, https://doi.org/10.1016/B978-0-323-99714-0.00018-2.

[23] Nikolaus Pitkowitz & Alice Fremuth Wolf (2018) The Vienna Repositioning Propositions Repositioning Actors and Actions in INTERNATIONAL ARBITRATION, AUSTRIAN YEARBOOK ON INTERNATIONAL ARBITRATION 2018 (Wien, 2018).

[24] Pre-Arbitral Referee Procedure (1999) Art. 3.1; For a comprehensive overview of the referee procedure, see Jan Paulsson, A Better Mousetrap: 1990 ICC Rules for a Pre-Arbitral Referee Procedure, Vol.18, INT'L BUS. LAW, 214 (1990).

[25] Pure Helium India (p) Ltd. Vrs. Oil and Natural Gas Commission (2003) 8 SCC 593 (Supreme Court Civil Appeal No. 6478 of 2001, decided 09.10.2003).

[26] Red Eagle vrs. Colombia (2024), Arbitration case (ICSID Case No. ARB/18/13.

[27] Robertson AR, FCIArb C. Arb, International Partner Locke Lord LLP and Steve Anderson, Vice President, ICDR (2022) International Centre for Dispute Resolution, Guidelines on the use of Arbitral Tribunal Secretaries, American Arbitration Association, Inc.

[28] Shetty R (2022) Recognition and Enforcement of Emergency Arbitration in India: A Comment on the Supreme Court's Ruling in Amazon - Future Dispute. Published in Argus Partners (23.03.2022).

[29] Siegel Joseph A., (2007) Alternative Dispute Resolution in Environmental Enforcement Cases: A Call for Enhanced Assessment and Greater Use, 24 Pace Envtl. L. Rev. 187.

[30] Singh Tannishta & Sajwan Mayuri (2020) Power of Arbitrator to interpret and strike down the terms of contract. In: Knowledge Bank, MCO legals.

[31] Tseng Cheng-Jui & Lin Shih-Yen (2024) Role of Artificail Intelligence in carbon cost reduction of firms, in Journal of cleaner production, vol. 447, https://doi.org/10.1016/j.jclepro.2024.141413

[32] United Nations Framework Convention on Climate Change (Paris Agreement, 2015).

[33] Yeshudas Dr. Anthoni, Artificial Intelligence for Environmental Protection in "Sustainable Solution for Green Environment", PP. 44 - 59, ISBN: 978-81-19149-97-1, https://www.kdpublications.in.
