International Journal of Economic Practices and Theories (IJEPT)
ISSN: 2247-7225
Volume 2026, Issue 1

From Smart Tech to Smart Law: Artificial Intelligence and the Evolution of Environmental Justice

[1]Dr. Anjali, [2]Ms. Lavanya Naugai, [3]Mr. Arnav Tiwari

[1]Assistant Professor, Vivekananda School of Law & Legal Studies (VSLLS) Vivekananda Institute of Professional Studies, GGSIPU

[2]Law Student (Third Year), Vivekananda School of Law & Legal Studies (VSLLS)

[3]Law Student (Third Year), Vivekananda School of Law & Legal Studies (VSLLS)

Abstract

As AI steadily advances in terms of social legitimacy and continues to permeate diverse societal domains, the imperative for broader governance and accountability intensifies, especially as international frameworks find themselves directly intersecting with environmental protections. AI has been transforming environmental jurisprudence primarily through the integration of smart technologies into dynamic legal systems. This transformation has further enhanced the scope for equitable resource protection and greater climate accountability. However, while clubbing technological advancements with legal principles, several global disparities in terms of economic resources, technological capabilities, and developmental paths cannot be ignored. These variations hinder the creation of efficient, equitable regulations for AI across social domains. Preparedness to regulate AI for mitigating tech-driven ecological harm can be easily checked on the touchstone of the European Commission's call for the "Sustainability & Ecological Responsibility of AI". Further, the rise of terminologies like "informational capitalism*"* has implications for AI in the backdrop of the irresistible force of digital technologies clashing with traditional legal structures. In light of sustainability challenges presented by the AI-environment link, this paper attempts to foster an understanding of the growing urgency of addressing significant developments in the field of AI, providing a fertile terrain for the interaction and inter-development of environmental legislative frameworks with AI. The present paper proposes a better legal framework integration and highlights alternative and innovative pathways to put in place trustworthy AI aligned with environmental goals while effectively dealing with sustainability gaps and issues related to ethical governance.

Keywords: AI Governance, Environmental Protections, Divergent Approaches, Informational Capitalism, Sustainability

Table Of Contents

Methodology Pursued

This study adopts a doctrinal and analytical methodology, utilizing a qualitative, descriptive, and exploratory design to investigate AI's role in environmental justice. It relies on secondary data from scholarly journals, policy reports (e.g., UNEP, NITI Aayog, Microsoft Sustainability Report), international frameworks (e.g., Rio Declaration, SDGs, EU AI Act), and case studies like IBM Green Horizon, Seoul waste management, and Cape Town water systems.

Doctrinal analysis dissects legal texts for alignment with sustainability, while thematic content analysis critiques global disparities, informational capitalism, and regulatory gaps across Global North-South contexts. Data collection involved targeted review of recent publications (up to 2026) via academic and official sources, ensuring interdisciplinary synthesis without primary data.

The scope emphasizes policy intersections in India and internationally, with limitations including secondary data bias and absence of empirical surveys; future work could incorporate quantitative modeling.

Results Of The Research & Discussion

1. Introductory Comments

Artificial intelligence represents a crucial turning point, not just for humans, their basic tasks or corporations for management, but is instilled with the hope of tackling some of the biggest environmental emergencies that the world faces currently. The utilisation of artificial intelligence has already been rampant concerning its usage over China's IBM GREEN HORIZON PROJECT, to Cape Town's SMART WATER MANAGEMENT, which will be elaborated further in the next section of this paper. The debate continues to persist, whether AI stands as a game-changer in boosting climate regulation and planning, or an unexplored tool that still requires examination. AI presently can be perceived as a double-edged sword, with a high probability of a successful energy transition to outweighing advancements due to environmental burden, it further exacerbates[1].

But partial discussions over stage-wise emissions, or vague probabilities, cannot serve the purpose of bringing true revolution or true regulation to the effective usage of AI. Thus, by exploring and inculcating a variety of case studies and research, present in every section of this paper, researchers would be able to get a "Better, Broader & Fuller Understanding" of policy making, governance & better options with AI. The direct intersection of policy making and technology significantly influences the future we are creating and contributing to for our future generations, from the distributive approach, *i.e.*, based on the enduring Principle of the Rio Declaration 'Intergenerational Equity,'[2] right to development, spanning over the needs of present and future generations, equitably.

Advancement of AI, towards greener implementation *via* climate policies, and potential of transforming decision-making, requires a broad assessment, regarding the lack of access to digital means, policy approaches, vulnerabilities of its implementation and most importantly, the ethical quotient it must inhibit itself with. With collaborative sentiment, AI can be used successfully to achieve SDGs 6[3], 8[4], 13[5] & 16[6], by operationalising its relevance for a greener and sustainable future, filled with comfort and well-being. Thus, this discussion can provide us with a balanced approach and a prospective plan of action.

[1] T. Dhar, B. S. Rawat, S. Pandev, V. Pachouri and A. Kathuria (2023), *Artificial Intelligence in Contending Climate Change to Achieve Environmental Justice*,(ICPCSN*)*, 502-506.
[2] United Nations, (1992), *Principle 3, Rio Declaration on Environment & Development,* A/CONF.151/26 (Vol.1), 2
[3] United Nations. (2023). *Goal 6: Clean Water & Sanitation*.**Available at:** sdgs.un.org. (**last accessed 20/01/26**)
[4] *Id, Goal 8: Promote Sustained, inclusive & sustainable economic growth.*
[5] *Id, Goal 13: Take urgent action to combat climate change and its impacts*
[6] *Id, Goal 16: Peace, Justice and Strong Institutions*

The enormous potential yields of AI cannot be overlooked, but practical examples of it outweighing its efficiency cannot be ignored either, such as the Microsoft 2024 Environment Sustainability Report[7] which examines the direct relationship between rising emissions by nearly 30% and rising demand for Data Centres. The differences exist throughout areas, from Europe to Asia, and can cause us to reconsider the decisions we are unknowingly making by neglecting to make AI greener or, at the very least, *bringing a set of explicit green industry standards*. Through this research, we hope to narrow down and realize the projected usage of AI, the emergence of Informational Capitalism, and its capabilities, by the end of this research, to find an answer to the above-mentioned hypothesis.

2. Transformative Role of AI in the Environmental Jurisprudence

The globe is accelerating at a steady and consistent speed for achieving revolution in climate action with the aid of digital transformation and integration, ever since COVID-19 struck at its already boiling geo-politics of the world. Environmental Injustice refers to inequitable & disproportionate exposure of poor, minority and disenfranchised populations to toxic chemicals and other environmental hazards[8]. This concept and the beginning of Environmental Jurisprudence dates back to the era of colonialism, which led to the formation of "Developed & Developing" or "North & South Divide", which embarked upon the growing inequities between the respective regions, as an outcome of years of perpetual exploitation.

With the onset of Environmental Jurisprudence, starting from the Stockholm Declaration of 1972, up to the adoption of the the UN's Sustainable Development Goals in 2015, all of which continually brought the world closer to rethinking and re-evaluating the integration of science and technology, most importantly AI, to reduce gaps in potential and real progress. This is also relevant & competitive for each nation, as 2026 marks only 4 years to the conclusion of the "Decade of Action", a term coined by UN Secretary-General Antonio Guterres, representing a sense of motivation, yet urgency at the same time. It has been predicted through some notable case-based research studies, [9] that in 30 years, there is a high probability that over 65-70% people of the world population will reside in urban environments.[10] Yet, if we apply the same to the present situation that is prevalent in major urban cities around the globe, be it Beijing, New York, New Delhi, Mumbai among others, common environmental challenges persist, to an extent that these cities have grown in tendency to become less accomodative, people-friendly in terms of the ecosystem it inhibits, the recent flaggering air condition of New Delhi[11], forced media, citizenry and even governments to quit inaction and effectively realise reformative policies.

But the use of AI isn't as novel or at a nascent stage as it appears; its usage & relevance have been accepted & repeatedly demonstrated by various reports & operations. A few of them have been provided below, which truly revolutionise the prospect of change that can be brought with the deployment of AI in detections & installations.

---

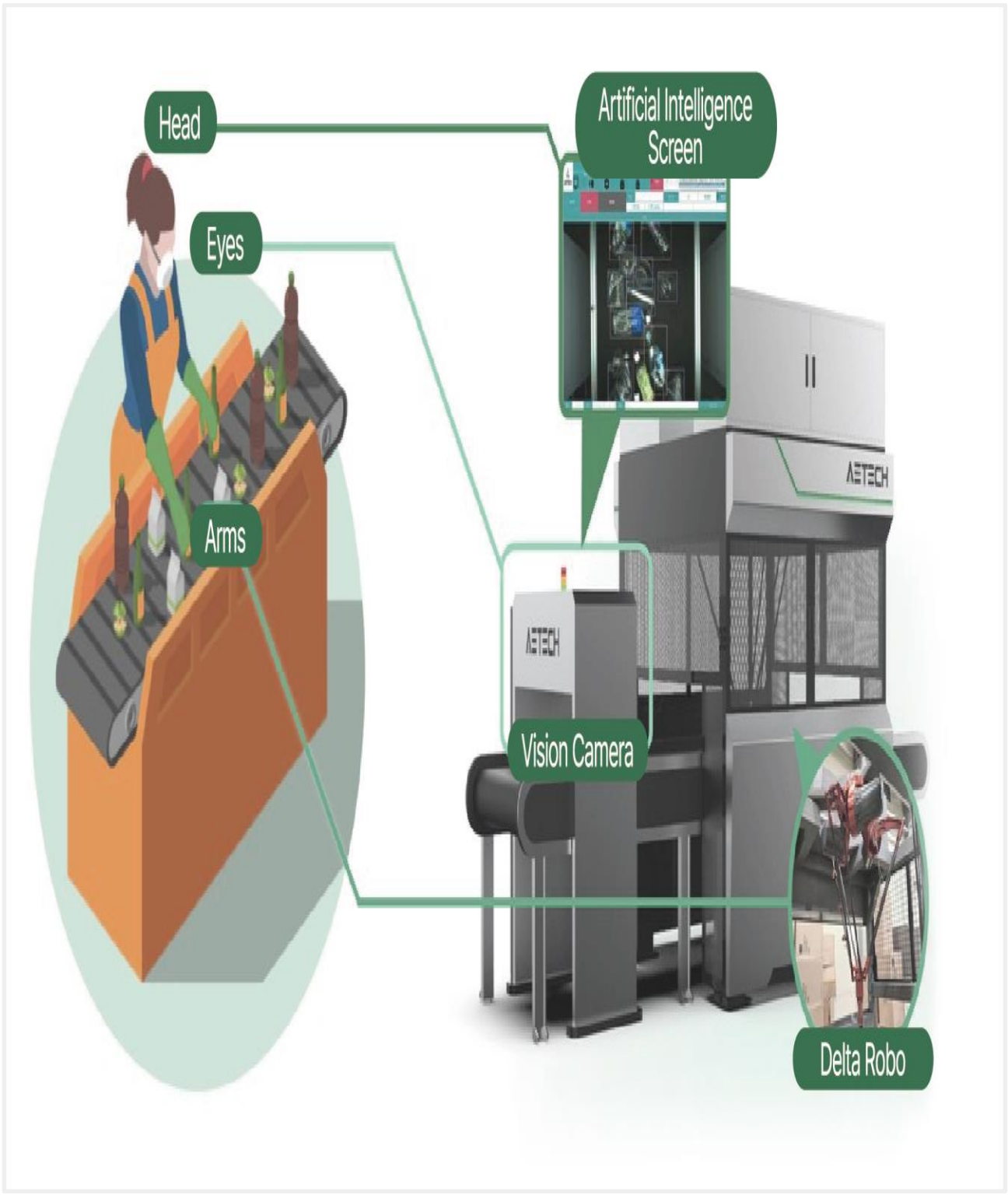
[7] Brad Smith, Melanie Nakagwa (2024), *Our 2024 Environment Sustainability Report,* Microsoft on the Issues - Blog. **Available at:** *https://blogs.microsoft.com/on-the-issues/2024/05/15/microsoft-environmental-sustainability-report-2024/* (**last accessed 20/01/26**)

[8] Landrigan, P. J., Rauh, V. A., & Galvez, M. P. (2010). Environmental justice and the health of humans. *The Mount Sinai journal of medicine, New York*, *77*(2), 178–187. **Available at:** *https://doi.org/10.1002/msj.20173* (**last accessed 22/01/26**)

[9] Lenzi, A. Why urbanisation and health? *Acta Biomed.* **2019**, *90*, 181–183

[10] Krupnova, T. G., Rakova, O. V., Bondarenko, K. A., & Tretyakova, V. D. (2022). *Environmental Justice and the Use of Artificial Intelligence in Urban Air Pollution Monitoring*. Big Data and Cognitive Computing, 6(3), 75. **Available at:** *https://doi.org/10.3390/bdcc6030075* (**last accessed 22/01/26**)

[11] *CAQM invokes Stage-III of Extent GRAP in Entire Delhi-NCR, with immediate effect*. (n.d.). **Available At:** *https://www.pib.gov.in/PressReleasePage.aspx?PRID=2203566®=3&lang=2*, (**last accessed 23/01/26**)



Source: Smart City Korea | AI-Based Recycling Robots

Case Study	Conduction	Analysis & Results
IBM'S GREEN HORIZON PROJECT IN CHINA[12]	Beijing Environmental Protection Bureau	Incorporation attributed to reduction of pollution in Areas of Beijing, with over proved 20% reduction. Involved the usage of predictive models and positive policy interventions)
AI-ENABLED WASTE MANAGEMENT IN SEOUL, SOUTH KOREA[13]	AETECH Co., Ltd.	Recycling waste, via the usage of AI Resources Recycling robot, used for optimal sorting of 6 types of recyclable wastes, in regions like Daegu & Jeju Island, such as transparent PET bottles or cans. Optimising collection routes and schedules resulted in a reduction of carbon emissions from waste collection vehicles, with over 34% increase in recycling rates. Deep-learning vision and algorithm targeting waste materials, on the basis of colour, texture, type and usage. Transmitting real-time data & maintenance Faster, quicker & less strenuous
SMART WATER MANAGEMENT IN CAPE TOWN[14]		AI-driven water conservation systems, which have sensory-based networks for collection, analysis & sorting of data for well-informed decision making, Thus, involve the leverage of data analytics. Sensors → Usage of water Involves data analysis from sensors & support systems, which are further interpreted with Supervisory Control & Data Acquisition (SCADA), then further transmitted to affected stakeholders. To date have successfully reduced water consumption by 50%, through the adoption of Municipalities in *Cape Agulhas, Saldanha Bay,* among others.

The above-mentioned *IBM'S GREEN HORIZON PROJECT* is also presently in talks with INDIA over Delhi pollution rates, formulating an agreement with **Delhi's Dialogue Commission,** in understanding the correlation that exists between *traffic patterns & air pollution*[15].

[12] *IBM expands Green Horizons initiative globally to address pressing environmental and pollution challenges*.(2015) (n.d.). IBM UK Newsroom. **Available At:** *https://uk.newsroom.ibm.com/2015-Dec-09-IBM-Expands-Green-Horizons-Initiative-Globally-To-Address-Pressing-Environmental-and-Pollution-Challenges* (**last accessed 24/01/26**)
[13] Sca. *[Best Solution] AI-based waste sorting robot*. (2024) SMART CITY KOREA (**last accessed 1/02/26**).
[14] *Smart water systems*. (n.d.) **Available at:** *https://greencape.co.za/assets/SMART_SYSTEMS_INDUSTRY_BRIEF_31_1.pdf* (**last accessed 1/02/26**)
[15] *Supra 7*

As we conclude this section, it is important to note that the primary challenge currently facing the implementation of artificial intelligence is not solely related to its capabilities, but also to the informed decisions we make through it, aimed at fostering a better and more inclusive future. With the advent of the COVID-19 pandemic, humanity experienced a significant disruption, which curtailed a unique opportunity to explore and comprehend the severity of environmental injustice. This situation generated a social catharsis by revealing and deepening awareness of the disparities that extend beyond local hazards to encompass global endemic issues, thereby exposing the preparedness that the world "**claimed to have**."[16]

3. Global Challenges in AI Regulation for Environmental Goals

Artificial intelligence stands as a concept that has been debated frequently by computer scientists and various stakeholders around the world. A perspective that goes beyond the classical risk of algorithmic bias or perpetual discrimination in datasets, to environmental risk associated in the training and deployment of artificial intelligence for the purposes humanity seeks to achieve[17]. But the challenges of the deployment of artificial intelligence are insurmountable. *It has been recognised as a potential contributor to Climate change,* current estimates showing that over 3.9% of global Greenhouse gas emissions are the aftereffect of artificial intelligence[18] in stark comparison with 2.5% emitted for global air travel[19].

The paradox of AI's use, alongside the contrast the Global South continues to face in the context of the implementation and infrastructure, is deeply concerning & remains a major barrier to its effective regulation. One such report of UNEP over comprehensive research of AI's lifecycle[20]It was revealed that over 300,000 kg of carbon dioxide emissions had been emitted while training a single large language model (used for integration, data automation & prediction).

Thus, it not only emits a huge amount of energy and consumes at the same time, but *also plays a significant role in pumping & guilping in tonnes of water for cooling data centres,* tapping over 5 Million Gallons of fresh water which could be rather used for a town. It is equally true that, with the coming of this AI Gold Rush amongst the Global North & South, historical vulnerabilities & asymmetrical power distribution are unleashed at a greater level, *whereas the Global South remains devoid of actual acceptance of AI-Driven growth* due to a lack of infrastructure supporting it.

It has been duly acknowledged that the benefits of the new revolution that AI seeks to bring are severely concentrated only in regions of the Global North, *with the United States and China dominating its infrastructure, holding 50%[21] of its processing chips also known as "graphic processing units"* which are crucial for development of artificial intelligence, further exacerbating the creation of digital divide[22]. The difference lies in the divergent purposes of both Global North and Global South in terms of their expectations with the artificial intelligence infrastructure[23], whereas

---

[16] Osipov, V. S., & Skryl, T. V. (2022). *AI's contribution to combating climate change and achieving environmental justice in the global economy.* Frontiers in Environmental Science, 10, 952695.

[17] IPCC (2022), *6th Assessment Report, Climate Change 2022: Mitigation of Climate Change, Summary for Policymakers*, C.1–C.11. on the need for an all-encompassing, immediate climate transition in all sectors of society.

[18] Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domequallyisch, S., ... & Fuso Nerini, F. (2020). *The role of artificial intelligence in achieving the Sustainable Development Goals. Nature communications*, 11(1), **Available at:** *https://www.eesi.org/articles/view/data-centers-and-water-consumption*.(**last accessed 1/02/26**)

[19] ACM Tech.(2021) Policy Council, *ACM TechBrief: Computing and Climate Change* 1.

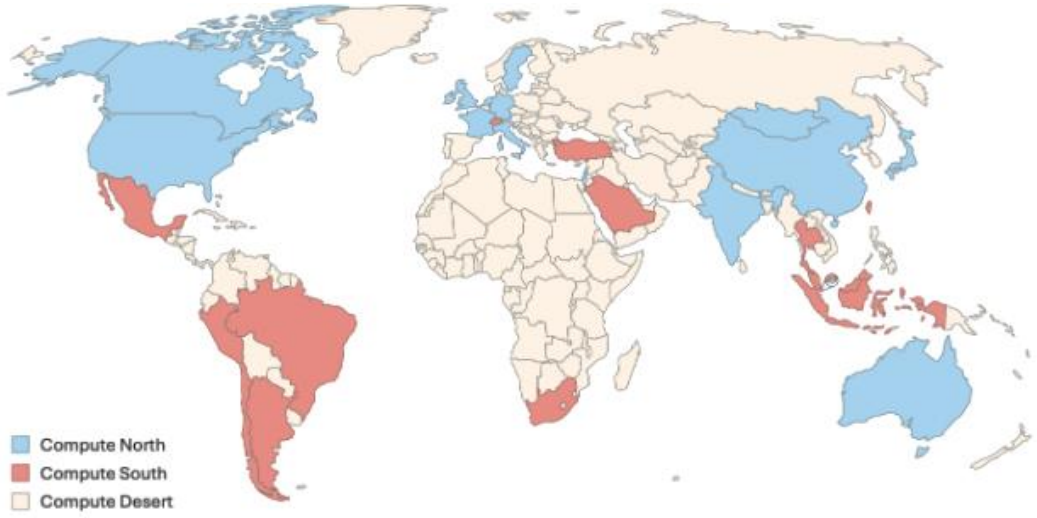
[20] Artificial Intelligence (AI) end-to-end (2021): *The Environmental Impact of the Full AI Lifecycle Needs to be Comprehensively Assessed* - Issue Not, **Available at:** *https://wedocs.unep.org/items/5f3afe87-5419-439b-a6ee-14240b2605e9* (**last accessed 28/01/26**)

[21] Vili Lehdonvirta, Boxi Wu, Zoe Hawkins (2024), *Compute North Vs. Compute South: The Uneven Possibilities Of Compute-Based AI Governance Around The Globe*,**Available at:** *https://osf.io/preprints/socarxiv/8yp7z* (**last accessed on 22/02/26**)

[22] Landenberg-Roberg (2023), "*Transformation durch innovationsfördernde Regulierung",*Zeitschrift für Umweltrecht 148, 152; (**last accessed 22/01/26**)

[23] Fisher and others (2012), *Environmental Law: Text, Cases & Materials (*Oxford University Press), 617.

the latter is simply seeking an entry point into this vast revolution & hub of investment. The intensity of resource and energy backing AI Infrastructure, Data Centres & National Grids, is not at par with the capacity of many developing countries, who might be further *downtrodden in this AI Gold rush,* by offering illogical tax benefits, zones & lethargic environmental bulwarks.



Source: | Compute North V. Compute South | Vili Lehdonvirta

The main concern, as enumerated in the above figure, is the regional and resource-based inequality that persists between the Global South & Global North (or as stated in the above figure, *Compute South & Compute North*). It is equally true that most of the countries in and around the world are definitely taking part in the AI Gold Rush, but none of them seem to take care of our environment and sustainability with this rush & its efficiency. More than 190 countries have adopted a series of non-binding recommendations on the sustainable and ethical usage of artificial intelligence[24]. This AI Gold Rush can also be equated to the rise of a new mutation of colonialism i.e., *Digital Colonialism,* wherein a cluster of multinational corporations dominate and control environmental technologies, like Microsoft investing over $6 Billion over Renewable Energy Powered AI Infrastructure.

The concern is not regarding the usage of renewable energy or greater innovation, but the *long-term impact and lobbying which will significantly impact & manipulate next Global climate policies in the upcoming decades*[25].The contemporary conditions of India and Kenya are the greatest example of the division that persists between the Global North and Global South[26].

- Mumbai's Aarey Colony, which aims at revolutionising technology modernisation at the cost of Adivasi lands which are subsequently sacrificed in the name of data centres & systems.
- Kenyan M-Situ AI-Based Mechanism, which proceeds towards the direction of fire and disturbance detection to forests, but at the same time, clashes with the traditional ecological knowledge of tribals, regarding biodiversity, rejuvenation & forest health.

[24] UNESCO (2022), *Recommendations on the Ethics of Artificial Intelligence.* **Available at:** *https://unesdoc.unesco.org/ark:/48223/pf0000380455/PDF/380455eng.pdf.multi* **(last accessed 24/01/26)**
[25] H. Yuan et al. (2020), *Evaluation of Smart Environmental Protection Systems and Novel UV-Oriented Solution for Integration, Resilience, Inclusiveness and Sustainability,* 2020 5th International Conference on Universal Village (UV), Boston, MA, USA,, pp. 1-77, doi: 10.1109/UV50937.2020.9426222. **(last accessed 26/01/26)**
[26] Krishna, K. (2024). *Artificial Intelligence & the Global South: Bridging or Exacerbating the Digital Divide?. Available at SSRN 4866372*.

What makes digital colonialism, even more *dangerous than prior forms,* is the entire web of institutional and infrastructure backing which protect and sustain it, ranging from data colonialism of users of global south, to creation of poor technical standards by Northern institutions, to ravishing the global human rights of every user, in terms of environment, in terms of data centres, electric waste dumping, *for example,* Chile & Uruguay, which continue to suffer from severe droughts, have openly accepted opening & establishment of Google Data Centers, in the downtrade of AI Gold Rush & to reap its benefits, though virtually devoid[27].

If seen from the perspective of a few of the Global South countries, colonialism is moving at a high speed, mirroring historical extractions:

- Establishment of data centres around prime cities of India, ranging from 150-248 Data centers, both in Tier 2 & Tier 3 cities in India[28]
- Google's $15 Billion investment in Andhra Pradesh to Amazon's $8.3 Billion investment in Maharashtra[29], serving International AI burdens while accruing resources from the Indian subcontinent, similar to the colonial past of India.

As always, when climate change & its aftereffects strike at the world's threshold, the first ones to suffer would be the developing countries, or the Global South. But, the climate responsibility seems to exacerbate, especially in relation to the European Union & Environmental Regulations, which aren't simply about ethics, but actually upholding climate responsibility, present in Ireland's rejection of Google Data Center bearing in mind the 224,250 tonnes of annual carbon emissions, at stake. But, the moment India, Kenya & countries in Latin America accept these, they not only accept climate burdens, but that too at a subsidised rate.

4. European Standards & Sustainability Imperatives

The European Union (EU) serves as a benchmark for global AI governance standards, providing an essential framework to evaluate preparedness among significant disparities and inconsistencies among governments pursuing environmental sustainability.[30] Strong legal frameworks are necessary as AI technologies spread due to their environmental impact, which ranges from resource-intensive hardware production to enormous energy demands in data centres. The EU is setting the standard with its all-encompassing approach. This leadership is demonstrated by the European Commission's "Sustainability & Ecological Responsibility of AI" framework, which acts as a paradigm for directly incorporating ecological requirements into regulation design.

It requires providers of high-risk systems exceeding 10^25 floating-point operations (FLOPs) to disclose computational training costs, carbon footprints throughout the AI lifecycle from data curation and model training to inference and decommissioning and mitigation strategies.[31] It builds on the crucial 2024 updates to the EU AI Act by imposing detailed requirements for energy-efficient AI development and lifecycle assessments (LCAs). This is in line

[27] Nunna, N. (2025, October 15). *Digital Colonialism: How developed nations export environmental costs to the Global South - Neo Science Hub.* Neo Science Hub. **Available at:** *https://neosciencehub.com/digital-colonialism-how-developed-nations-export-environmental-costs-to-the-global-south/* (**last accessed 27/01/26**)

[28] Ministry of Electronics & IT (2025), *India building secure, scalable and AI ready cloud infrastructure to support digital governance,* PIB Government**. Available at:** *https://www.pib.gov.in/PressReleasePage.aspx?PRID=2202897&reg=3&lang=2*(**last accessed 28/01/26**)

[29] ***Supra 26***

[30] Oecd.org. *Progress in Implementing the European Union Coordinated Plan on Artificial Intelligence (Volume 1)*.(**last accessed 28/01/26**)

[31] Kleoniki Pouikli, Ifigeneia Tsakalogianni (2025), '*AI as an Environmental Challenge: Mapping Safeguards in EU Environmental and Climate Law to Address the 'Silence*' in the EU AI Act', 34, European Energy and Environmental Law Review, Issue 2, pp. 25-37.

with the larger objectives of the EU Green Deal, which aims to achieve climate neutrality by 2050 and a 55% decrease in greenhouse gas emissions by 2030. It guarantees that AI supports rather than undermines these objectives.[32]

Data centres currently account for 2-3% of the EU's total electricity consumption, a figure projected to increase to 9% by 2030, according to the Shift Project's analysis. Additionally, significant resources are required for AI training; for instance, the GPT-3 model consumes *approximately 700,000 litres of water for cooling,* as highlighted by a study from the University of California Riverside. In response, the framework advocates for "Green AI" principles, which include energy-efficient strategies like knowledge distillation, quantisation, and model pruning, potentially reducing energy usage by up to 90% without sacrificing model performance[33]. The EC's framework offers both guidance and caution, establishing a transparency framework aligned with the CSRD that mandates LCAs for high-risk AI applications. A 2025 OECD report praises 15 EU Member States for using AI to enhance environmental efforts but notes that only six have taken steps to minimize AI's ecological footprint, and only seven have collected environmental impact data[34].

The UN Environment Programme's Global E-Waste Monitor 2024 predicts electronic waste from outdated AI hardware will hit 1.5 million metric tons annually by 2030[35]. A 2025 Utrecht University analysis rates the framework's implementation at 5/10, citing self-reporting reliance and lacking metrics like biodiversity loss. Despite potential fines of 7% of global turnover, enforcement remains challenging. Comprehensive reform is needed to fully integrate planetary boundaries into AI risk classifications[36].

When comparing non-EU countries to these EU requirements, it reveals significant differences in the mitigation of AI-induced ecological harm. According to NITI Aayog's AI for Sustainability in India report and Central Electricity Authority data[37], India's draft National Strategy for Responsible AI (2025, Ministry of Electronics and Information Technology) falls well short, providing voluntary ethical impact assessments but leaving out mandatory LCAs, FLOP thresholds, or energy caps despite *AI infrastructure consuming 2.5% of the country's electricity on a grid that is still 70% dependent on coal.*[38]

The EU's strict 0.5g CO2 per kWh operational criterion for high-risk models stands in contrast to this. The Biden-era Executive Order on *Safe, Secure, and Trustworthy AI (2023,[39] with updates from the Trump administration in 2025)* in the US relies on federal procurement guidelines and voluntary efficiency benchmarks, but according to Environmental Protection Agency inventories, hyperscalers account for 2.3% of the country's GHG emissions without legally binding LCAs.

EU principles are positioned as accelerators for cross-border AI governance, with revolutionary consequences for the harmonisation of international law. The Technical Barriers to Trade (TBT) Agreement of the World Trade Organisation might be amended to require "sustainability conformity assessments" for AI imports and exports,

---

[32] Aline Cabral Costa Andrade & Maria Claudia Solarte Vasquez. *The Compatibility Between SDGs and the EU Regulatory Framework of AI. Journal of Ethics and Legal Technologies*-Volume 6(1)

[33] Weforum.org. Europe is lagging in AI adoption-how can businesses close the gap?

[34] Dr. Anju Pandey. Prof. G. N. Sinha. The Legal Landscape of Artificial Intelligence for Sustainability. European Economic Letters ISSN 2323-5233 Vol 15, Issue 3 (2025)

[35] Commission.europa.eu. Keeping European industry and science at the forefront of AI, **Available at;** *https://commission.europa.eu/topics/artificial-intelligence_en* (**last accessed on 1/02/26**)

[36] Denis Chivanov, "*International Standards for Artificial Intelligence and the Environment*", Synchroinfo Journal 2025, vol. 11, no. 2, pp. 41-52

[37] NITI Aayog, *National Strategy for Artificial Intelligence* [Report] **Available at:** *https://www.niti.gov.in/ sites/default /files/2023-03 /National-Strategy-for-Artificial-Intelligence.pdf* (**last accessed on 1/02/26)**

[38] Niti Aayog(2018). *National Strategy for Artificial Intelligence* (**last accessed on 25/01/26**)

[39] The White House. (2025, January 23). *Removing Barriers to American Leadership in Artificial Intelligence*. The White House. **Available at:** *https://www.whitehouse.gov/presidential-actions/2025/01/removing-barriers -to-american-leadership-in-artificial-intelligence/*(**last accessed on 26/01/26**)

mandating LCA compliance similar to the EU's Carbon Border Adjustment Mechanism (CBAM), which imposes taxes on high-emission commodities. Building on EU-led initiatives at COP29 in Baku (2024 outcomes extended into 2025), the UNFCCC framework would allow marketable "green AI credits" for low-emission models by incorporating AI-specific clauses into Nationally Determined Contributions (NDCs) under Article 6.[40]

5. Informational Capitalism & Challenges to Environmental Legal Structures

By viewing information as a raw element similar to labour or oil in earlier times, informational capitalism fundamentally redefines traditional capitalist processes. According to legal scholar Amy Kapczynski, this is a system in which companies such as Google, Meta, and Amazon unilaterally appropriate human experiences by monitoring online activity, app usage, and even IoT sensors to create "*personalised*" services that actually promote profit maximisation and behavioural modification.[41]

This paradigm goes beyond simple data collection to include a global network of data centres that handle petabytes of data every day. By 2026, the spread of AI has accelerated this, with hyperscale facilities proliferating in places like *rural Virginia, Ireland, and Tier-2 cities in India,* frequently with financial incentives that put economic expansion ahead of environmental protection. Thus, informational capitalism represents a type of "platform capitalism," in which monopolies are strengthened by network effects that distort markets and externalise environmental costs to society.

Critics argue that this is similar to historical extractivism, also known as the new "resource curse", but with diffused accountability because the effects are not localised industrial emissions but rather algorithmic and planetary.[42] As a result, there is a feedback loop whereby greater AI is fueled by more data, which necessitates more infrastructure. The energy and resource requirements of AI-enabled data centres are where the ecological cost of informational capitalism is most noticeable.

According to a 2025 Nature Sustainability study, under high-adoption scenarios, the energy consumption of AI servers alone could equal Japan's total electricity consumption by 2030, with global data centre CO2 emissions reaching 355 million metric tons annually, which is comparable to the footprint of the aviation industry[43]. Furthermore, recycling facilities are overburdened with electronic garbage from outdated servers, which is predicted to reach 20 million tons by 2030 and contaminate land and groundwater with lead and mercury.[44] These effects compound monsoon-dependent water cycles and coal-heavy grids (which supply 70% of power) in India, where data center capacity is expected to quadruple by 2027 amid booming digital economies, disproportionately burdening marginalized communities in states like Maharashtra and Uttar Pradesh.

Environmental regulations from the 1970s struggle with today's informational capitalism. The U.S. Clean Air Act mandates licenses for data center backups, but "emergency" generator exemptions enable NOx spikes. CERCLA enforces strict liability for contamination, yet rapid developments bypass community input under NEPA[45]. There's a

[40]European Commission. (2025). *The EU at COP29*. **Available at:** *https://commission.europa.eu/topics/climate-action/eu-cop/eu-cop29-climate-change-conference_en* **(last accessed on 26/01/26)**
[41] Amy Kapczynski(2019). *The Law of Informational Capitalism ,* Yale Law Journal
[42] Xiao, T., Nerini, F.F., Matthews, H.D. et al (2025). *Environmental impact and net-zero pathways for sustainable artificial intelligence servers in the USA*. Nat Sustain 8, 1541–1553
[43] Shaun Zhang, LaVon M. Johns, Brian O'Connor Watson & Keyonn L. Pope(2020).*Legal Challenges and Opportunities at the Intersection of AI Data Centers and Power Infrastructure.*(**last accessed on 28/01/26)**
[44] Jens Gröger. Felix Behrens. Peter Gailhofer. Inga Hilbert (2018). *Environmental Impacts of Artificial Intelligence.*
[45] attorneys.media. How Does Corporate Environmental Responsibility Face Legal Challenges?

"governance vacuum" lacking AI-specific Environmental Impact Assessments, leaving voluntary ESG disclosures exposed to greenwashing lawsuits, as seen in recent Meta[46] and Google cases[47].

The Digital Personal Data Protection Act (2023) in India addresses privacy but ignores ecological externalities, depending on the general Environment Protection Act EIAs that are unsuitable for hyperscale computing. The 2025 EIA Notification's lack of AI-specific provisions leaves data centres using antiquated thermal power benchmarks. Informational capitalism exacerbates environmental injustice, particularly affecting marginalized communities worldwide, as seen in India's growing data centers.[48] . Concentrated in regions like Maharashtra and Uttar Pradesh, these facilities strain water resources, illustrated by Google's Chennai site using 20 million liters daily amid droughts. Special Economic Zone tax breaks further limit public funding for social services[49] .

Similar patterns occur in Chile[50], where lithium mining disrupts indigenous water rights, leading to cultural erosion. The Democratic Republic of the Congo faces ecological devastation from rare earth mining, harming local communities and environments. In Ghana's Agbogbloshie, exported e-waste harms vulnerable populations, while wealthier nations evade accountability. This situation broadens the North-South divide, risking a future where affluent societies enjoy luxury amid widespread contamination.

6. Harmonising Innovation, Accountability & Collective Responsibility

To address these injustices, a shift to “smart law” is necessary, involving AI-specific Environmental Impact Assessments and robust regulatory frameworks. Proposed solutions include community-governed AI auditors and enforceable equity audits to prioritize justice and local benefits in development projects. AI-specific Environmental Impact Assessments (EIAs) that incorporate real-time emissions graphs via API disclosures, lifecycle analyses from chip fabrication to decommissioning, and predictive modelling of hyperscale expansion must be pioneered domestically.

Technology itself provides tools for enforcement, AI auditors, which are open-source and community-governed, could identify greenwashing in ESG reports with fines scaled to revenue (e.g., 4% of global turnover under GDPR analogues)[51], while blockchain-ledgered offsets prevent double-counting, as tested in California's Cap-and-Trade. Justice should be the top priority when it comes to citing reforms. For example, equity audits under Title VI may be mandated by U.S. NEPA revisions through executive order, prohibiting construction in "sacrifice zones," while amendments to India's Land Acquisition Act may mandate 50% local hiring and income sharing, closing SEZ loopholes[52].According to the *World Economic Forum's 2025 AI Governance Playbook*[53], the average level of non-EU

[46] Li Ziwei. Wang Xingyu. Wu Zhuang(2024). *Corporate environmental infringement, legal regulation, and sustainable development: punitive damages as a perspective*. Frontiers in Environmental Science. Volume 12.

[47] pollution.sustainability-directory.com. What Environmental Regulations Govern AI Implementation? **(last accessed on 28/01/26)**

[48] Vera LA, Walker D, Murphy M, Mansfield B, Siad LM, Ogden J; EDGI (2019). *When Data Justice and Environmental Justice Meet: Formulating a Response to Extractive Logic through Environmental Data Justice*. Inf Commun Soc. ;22(7):1012-1028.

[49] Vera LA, Walker D, Murphy M, Mansfield B, Siad LM, Ogden J; EDGI (2019). *When Data Justice and Environmental Justice Meet: Formulating a Response to Extractive Logic through Environmental Data Justice*. Inf Commun Soc.;22(7):1012-1028.

[50] 1. King L. Environmental Justice and Capitalism. In: Legun K, Keller JC, Carolan M, Bell MM (2020), eds. *The Cambridge Handbook of Environmental Sociology*. Cambridge University Press;:452-469.

[51] Osborne, C. (2025). *The business of open-sourcing artificial intelligence: commercial interests and collaboration dynamics in machine learning developer communities* (Doctoral dissertation, University of Oxford)

[52] Qian, J. Strategic Permissiveness: How China's Open-Source AI Licensing Transforms Global Governance. *Available at SSRN 5936856* **(last accessed on: 5/02/2026)**

[53] World Economic Forum (2025)., *Advancing Responsible AI Innovation: A Playbook*. **Available at:** *https://www.weforum.org/publications/advancing-responsible-ai-innovation-a-playbook/* **(last accessed on: 5/02/2026)**

readiness is 40%. The US scored 60% thanks to private sector innovation, China scored 50% due to opacity, and India scored a pitiful 35% because of policy divisions between MeitY, NITI Aayog, and environmental ministries. These comparisons show how systemic underpreparedness elsewhere is revealed by EU metrics, such as prohibitive harm thresholds, auditable mitigation plans, and required energy reporting.

Metric	EU (AI Act 2024)	India (Draft 2025)	US (EO 2025)	China (AI Law 2024)
Energy Reporting	Mandatory FLOPs/LCA	Voluntary	Voluntary	Partial (provincial)
Carbon Mitigation	Binding Plans w/ Audits	Guidelines Only	Incentives/tax credits	National Quotas
High-Risk Thresholds	>10^25 FLOPs; 0.5gCO2e/kWh	None Defined	Risk-based voluntary	Scale and Security
Enforcement	Fines up to 7% global revenue	Advisory Committees	Self Certification	State/Party Oversight
Readiness Score	80% (OECD)	35% (WEF)	60% (WEF)	50% (WEF)

Globally, such distinctions & technological divide, can only be addressed by the creation of a UN AI-Environment Protocol may standardise Scope 1-3 reporting with third-party verification and impose trade consequences for non-compliance similar to the Montreal Protocol, building on COP29's 2025 digital sustainability commitments[54]. A Global Data Centre Registry may oversee the water-energy nexus and support tech transfers for the Global South, aiming for 28 GW of renewable energy by 2030 and promoting equitable deployment. However, these principles are consistently undermined by digital capitalism, which prioritises profit extraction over the health of the earth in ways that call for immediate reevaluation. According to their SEC filings and earnings calls, tech hyperscalers like Google (Alphabet), Microsoft, and Amazon invested over $100 billion in AI capital expenditures in 2025 alone. This led to yearly emissions of about 500 million metric tons of CO2 equivalent, which is comparable to the Netherlands' total output, according to the Shift Project's Lean ICT report[55]., yet progress can be further undermined by lobbying power of such Tech Giants in International Framework creations or even summits.

7. Conclusion & Suggestions for Progressive Realisation

The rapid technological advancements that have been made possible in the last decade with the help of artificial intelligence provide a fertile terrain for advancement in terms of environmental regulations and sustainable development, to actually achieve the 2030 agenda, which would stagger in case the new technologies are not deployed. But at the same time the outpacing of such development in regards to the environmental regulations concerning it, raise significant risks and governance gaps which increase the vulnerability and fragility of actually moving towards a sustainable path. It is equivalently true that artificial intelligence has brought a new revolution in the world, but at

[54] UNFCCC. (2024). *COP29 UN Climate Conference Agrees to Triple Finance to Developing Countries, Protecting Lives and Livelihoods*. United Nations Climate Change, **Available at:** *.https://unfccc.int/news/cop29-un-climate-conference-agrees-to-triple-finance-to-developing-countries-protecting-lives-and* **(last accessed on 3/02/26)**

[55] The Shift Project. (2025). *Lean ICT: Towards digital sobriety,* The Shift , **Available at:** *Project.https: //theshiftprojec t. org/en/publications/lean-ict/* (**last accessed on 4/02/26**)

the same time the commodification and capitalisation of such pursuits has reached new heights of rush, competition even at cost of lives of citizenry and human rights.

As discussed in this research, the possibilities of merging state mechanisms and market strategies for the development of Artificial Intelligence and its further deployment in sustainability, is not an impossible task, rather the same can be found in the European Union, alongside Asian countries like China and Japan. Yet the risks of expansion of Artificial Intelligence and the infrastructure surrounding it, continues to remain unchecked by staggering regulations which further deepens the potential of ecological harm it can cause. Just as International politics and domestic politics, the relevance of non-state actors and multiple stakeholders remain relevant, which will find a crucial place in the upcoming future of artificial intelligence, thus, such complexities and intersections demand a collaborative model. Informational capitalism as embarked in this research, cannot be sustained; rather a forward looking policy should be adopted by the Nations around the world.

In such a scenario, only a "Smart law" can transform AI into a force for justice by overcoming capitalism's short-termism and balancing technology with Earth's limited resources.This may involve a Global Data Centre Registry monitoring the effects of the water-energy nexus, with tech transfer provisions supporting the transitions of the Global South, 28 GW of offshore wind and solar by 2030, according to Nature, offsetting, and deployed equitably. Addition of Green AI clauses could be incorporated into bilateral agreements like the U.S.-India iCET, encouraging collaborative R&D in low-carbon chips.

- Mandatory AI Lifecycle Assessments (Inspired by EU AI Act Proposals)

Although it was lowered to voluntary guidelines, the EU AI Act (2024) originally suggested lifecycle environmental impact evaluations for high-risk AI systems, requiring logging of energy and resource usage. This was furthered by Denmark's EPA using AI-assisted digital permitting, which included sustainability inspections and cut approval times for renewable projects by 50%.[56] When we talk about the implementation of this policy in India, we can require providers to produce AI-specific lifecycle records covering training emissions, water use, and e-waste which will be verified by independent auditors like CPCB. The Environment Impact Assessment (EIA) Notification 2025 should be amended to categorize AI data centers over 50 MW as "Category A" projects. This will enforce Scope 1-3 disclosures, reduce underreported emissions (e.g., 662% REC disparities), and effective model design may reduce data center CO_2 by 20–30%. enhances investor confidence through uniform compliance, which is in line with India's NDC goals, and generates Rs. 5,000 crore in EIA fees for green funds every year.

- Punitive Damages and Greenwashing Penalties (U.S. CERCLA Influence)

Strict accountability for contamination is enforced by the US CERCLA; recent greenwashing lawsuits against Google (2025) have resulted in $100 million settlements. SB 253 in California requires Scope 3 disclosures and imposes a 4% revenue penalty for noncompliance. India can enact AI-specific clauses in Consumer Protection Act 2019 and Environment Protection Act 1986, imposing 2-5x punitive damages for REC misuse or false net-zero claims, plus mandatory audits.[57] This will prevent 662% of underreporting and recover Rs. 2,000 crore for remediation each year. increases judicial effectiveness, which is now just 33% pro-environment decisions, and promotes deterrence in the face of Big Tech lobbying.

- Green Incentives and Tax Credits (Singapore Roadmap)

In order to achieve 50% efficiency gains, Singapore's Green Data Center Roadmap (2025) provides tax incentives for PUE <1.3. India can extend the PLI plan with 20% tax credits for low-water AI technology, linked to 80% recyclability

[56] Nikolett Aszodi. The EU's AI Act: Dangerously Neglecting Environmental Risks. Issue #1. Available on: sustain.algoritmwatch.org

[57] epa.gov. Interim Guidance: Settling Civil Penalty and Punitive Damage Claims for Noncompliance with Superfund Administrative Orders

under the E-Waste Rules, by taking this policy into account. This will reduce the carbon footprint by 32–79 Mt and will attract foreign direct investment (e.g., $10B inflows). complies with Atmanirbhar Bharat by creating one lakh green jobs in retrofitting.[58]

References Of The Paper

1. Parajuli, P. (2024). *Curation and Analysis of AI Ready Environmental Justice Datasets: A Proof-of-Concept Study*. The University of Alabama in Huntsville.
2. Osipov, V. S., & Skryl, T. V. (2022). *AI's contribution to combating climate change and achieving environmental justice in the global economy*. Frontiers in Environmental Science, 10, 952695.
3. Zhen, Z., Lee, H., Segovia-Dominguez, I., Huang, M., Chen, Y., Garay, M., ... & Gel, Y. R. (2024). *Environmental justice and lessons learned from COVID-19 outcomes, uncovering hidden patterns with geometric deep learning and new NASA satellite data.* Artificial Intelligence for the Earth Systems, 3(1), e230040.
4. Muthuswamy, Myvizhi, and Ahmed M. Ali (2023). *Sustainable supply chain management in the age of machine intelligence: addressing challenges, capitalising on opportunities, and shaping the future landscape*. Sustainable Machine Intelligence Journal 3, 3-1.
5. Valiyev, S., Najafov, E. (2024). *Sustainable Development Aspects of Smart Environments and Green Technology: Case of Environmental Law. In: Mammadov, F.S., Aliev, R.A., Kacprzyk, J., Pedrycz,* W. (eds) International Conference on Smart Environment and Green Technologies – ICSEGT2024. ICSEGT 2024. Lecture Notes in Networks and Systems, vol 1252
6. Brownsword, R. (2019). *Law, technology and society: reimagining the regulatory environment*. Routledge.
7. Gundeti, R., Vuppala, K., & Kasireddy, V. (2024). *The future of AI and environmental sustainability: Challenges and opportunities.* Exploring Ethical Dimensions of Environmental Sustainability and Use of AI, 346-371.
8. Chauhan, D., Bahad, P., & Jain, J. K. (2024). *Sustainable AI: environmental implications, challenges, and opportunities.* Explainable AI (XAI) for sustainable development, 1-15.
9. Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domisch, S., ... & Fuso Nerini, F. (2020). *The role of artificial intelligence in achieving the Sustainable Development Goals.* Nature communications, 11(1), 233.
10. Kan, Y. (2025). *AI for Environmental Sustainability: Advances, Challenges, and Future Directions.* International Journal of Artificial Intelligence for Science (IJAI4S), 1(1).
11. Kumar, S. ., & Hooda, S. (2023). An Analytical Review of Political Communication in India with Special Reference to the Social Media. *MediaSpace: DME Media Journal of Communication*, *3*(01), 8–15. https://doi.org/10.53361/dmejc.v3i01.02
12. Sudhir Kumar, & Manpreet Singh. (2021). The News Is Either Restricted Or Excessively Political: A Perception Study Of People Of Delhi. *Elementary Education Online*, *20*(1), 4528–4538. Retrieved from https://ilkogretim-online.org/index.php/pub/article/view/2047
13. Boden, M. A. (2018). *Artificial intelligence: A very short introduction*. Oxford University Press.
14. Dubey, A. K., Kumar, A., Narang, S. K., Khan, M. A., & Srivastav, A. L. (Eds.). (2022). *Visualisation Techniques for Climate Change with Machine Learning and Artificial Intelligence*. Elsevier.

[58] Sapar, Jhony & Kusuma, Eka. (2025). Effectiveness of Tax Incentives in Increasing Investment in Green Technology and Green Energy. Advances in Taxation Research.

15. Vasant, P., Weber, G. W., Thomas, J. J., Marmolejo-Saucedo, J. A., & Rodriguez-Aguilar, R. (Eds.). (2022). *Artificial Intelligence for Renewable Energy and Climate Change*. John Wiley & Sons.

16. Hannan, M. A., Al-Shetwi, A. Q., Ker, P. J., Begum, R. A., Mansor, M., Rahman, S. A., ... & Muttaqi, K. M. (2021). *Impact of renewable energy utilization and artificial intelligence in achieving sustainable development goals*. Energy Reports, 7, 5359-5373.

17. Kleoniki Pouikli, Ifigeneia Tsakalogianni (2025), *AI as an Environmental Challenge: Mapping Safeguards in EU Environmental and Climate Law to Address the 'Silence' in the EU AI Act,* 34, European Energy and Environmental Law Review, Issue 2, pp. 25-37.

18. Dr. Anju Pandey. Prof. G. N. Sinha. *The Legal Landscape of Artificial Intelligence for Sustainability. European Economic Letters* ISSN 2323-5233 Vol 15, Issue 3 (2025)

19. Denis Chivanov, *International Standards for Artificial Intelligence and the Environment*, Synchroinfo Journal 2025, vol. 11, no. 2, pp. 41-52

20. Vera LA, Walker D, Murphy M, Mansfield B, Siad LM, Ogden J; EDGI (2019). *When Data Justice and Environmental Justice Meet: Formulating a Response to Extractive Logic through Environmental Data Justice*. Inf Commun Soc. ;22(7):1012-1028.

21. UNFCCC. (2024). COP29 UN Climate Conference Agrees to Triple Finance to Developing Countries, Protecting Lives and Livelihoods. United Nations Climate Change.