Journal of State Government and Mass Media

KMF

Volume: 4 Issue: 2
April-June, 2026

KMF PUBLISHERS

www.kmf-publishers.com /jsgmm/

Journal of State Government and Mass Media

Vol 4 Issue 2 (2026)

Research Article

OPEN

DOI: https://doi.org/10.64907/xkmf.v04i02.jsgmm.1

Regulating Artificial Intelligence for Environmental Justice: A Qualitative Study of Legal Practitioners' Perspectives

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The rapid expansion of artificial intelligence (AI) has introduced significant environmental and socio-legal challenges that remain insufficiently addressed within existing regulatory frameworks. This study examines the intersection of AI governance and environmental justice through a qualitative analysis of secondary data, focusing on legal practitioners' perspectives. Drawing on environmental justice theory, climate justice, and socio-technical systems theory, the research explores how legal actors interpret the environmental externalities of AI systems, including energy consumption, resource extraction, and electronic waste. The findings reveal that current AI regulations are fragmented and primarily centred on ethical concerns, often neglecting environmental impacts and distributive inequalities. Legal practitioners emphasise the need for stronger accountability mechanisms, enhanced public participation, and the integration of environmental law principles such as the precautionary and polluter pays principles. The study highlights the disproportionate burden of AI-related environmental harms on vulnerable communities, particularly in the Global South. It concludes that a more holistic and adaptive regulatory approach is necessary to align AI development with sustainability and justice objectives, offering policy recommendations for integrating environmental considerations into AI governance.

Keywords: Artificial Intelligence, Environmental Justice, AI Regulation, Sustainability, Climate Justice, Legal Governance, Socio-technical Systems

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1. Introduction

Artificial intelligence (AI) has rapidly evolved into a foundational technology shaping contemporary economic, social, and environmental systems. From predictive analytics and automation to decision-making systems embedded in governance structures, AI is increasingly positioned as a tool for efficiency and innovation. In parallel, global attention to sustainability and environmental protection has intensified, particularly in the context of climate change, biodiversity loss, and ecological degradation. The intersection of AI and environmental sustainability has therefore emerged as a critical area of inquiry, often framed through the lens of "AI for good" or "AI for sustainability" (Vinuesa et al., 2020). However, such narratives tend to obscure the environmental costs and justice implications embedded within AI systems themselves.

The environmental footprint of AI is multifaceted and extends across its lifecycle. At the production stage, the manufacturing of AI hardware requires rare earth elements and critical minerals, often extracted through environmentally damaging processes that disproportionately affect communities in resource-rich but economically marginalised regions (Banza Lubaba Nkulu et al., 2018). During operation, AI systems, particularly large-scale machine learning models, consume vast amounts of electricity and water, contributing to greenhouse gas emissions and resource depletion (Strubell et al., 2019). At the end of their lifecycle, electronic waste generated by AI hardware further exacerbates environmental degradation, particularly in countries lacking robust waste management systems (Parajuly et al., 2019).

These environmental impacts are not evenly distributed. Instead, they reflect and reinforce existing global inequalities, raising fundamental concerns about environmental justice. Environmental justice, broadly defined, encompasses the fair distribution of environmental benefits and burdens, meaningful participation in decision-making, and recognition of marginalised communities (Schlosberg, 2007). In the context of AI, this framework invites critical questions about who benefits from AI technologies and who bears their environmental costs. For instance, while AI-driven innovations may enhance efficiency and productivity in developed economies, the environmental burdens associated with resource extraction, energy consumption, and waste disposal are often externalised to the Global South (Crawford, 2021).

Despite growing awareness of these issues, regulatory responses to AI have largely focused on ethical principles such as transparency, accountability, and fairness, with comparatively limited attention to environmental considerations (Jobin et al., 2019). International initiatives, including the OECD AI Principles and the European Union's proposed AI Act, emphasise human-centric values but often lack explicit mechanisms for addressing environmental harms. This regulatory gap is particularly concerning given the scale and complexity of AI systems, which operate across jurisdictions and involve multiple stakeholders.

Legal practitioners occupy a critical position in addressing these challenges. As interpreters and implementers of legal frameworks, they play a key role in shaping regulatory responses to emerging technologies. Their perspectives offer valuable insights into the practical and normative dimensions of AI governance, including the challenges of enforcing regulations, balancing innovation with environmental protection, and ensuring accountability. However, there remains a lack of systematic research examining how legal practitioners conceptualise and respond to the environmental justice implications of AI.

This study seeks to fill this gap by exploring the perspectives of legal practitioners on regulating AI for environmental justice. Using a qualitative research design based on secondary data, the study analyses legal scholarship, policy documents, and interdisciplinary research to identify key themes and challenges. By situating AI within the broader framework of environmental justice, the study aims to contribute to a more holistic understanding of AI governance, one that integrates technological, legal, and ecological considerations.

The significance of this research lies in its interdisciplinary approach and its focus on justice-oriented regulation. While much of the existing literature on AI governance emphasises technical and ethical dimensions, this study foregrounds the environmental and social implications of AI systems. In doing so, it highlights the need for regulatory frameworks that not only promote innovation but also ensure sustainability and equity.

Furthermore, the study is particularly relevant in the context of developing countries, where environmental vulnerabilities are often compounded by limited regulatory capacity. Countries such as Bangladesh, for example, face significant challenges related to climate change, resource management, and industrial pollution. The integration of AI into such contexts raises important questions about how to balance technological advancement with environmental protection and social justice.

In summary, this study addresses a critical gap in the literature by examining the intersection of AI regulation and environmental justice from the perspective of legal practitioners. It argues that effective AI governance must move beyond narrow ethical frameworks to incorporate principles of environmental justice, including distributive equity, procedural fairness, and recognition of marginalised communities. By doing so, it seeks to inform the development of more inclusive and sustainable regulatory approaches.

2. Literature Review

The environmental implications of AI have gained increasing attention in recent years, particularly as the scale and complexity of AI systems have grown. One of the most widely discussed issues is the energy consumption associated with training and deploying machine learning models. Strubell et al. (2019) demonstrated that training large natural language processing models can generate carbon emissions comparable to those of multiple transcontinental flights.

Similarly, data centres that support AI infrastructure consume significant amounts of electricity and water, contributing to environmental degradation (Jones, 2018).

Beyond energy consumption, the production of AI hardware involves the extraction of critical minerals such as cobalt, lithium, and rare earth elements. These processes are often associated with environmental harm, including deforestation, soil degradation, and water pollution, as well as human rights violations (Banza Lubaba Nkulu et al., 2018). The disposal of electronic waste further compounds these issues, particularly in developing countries where informal recycling practices expose workers to hazardous materials (Parajuly et al., 2019).

Crawford (2021) argues that AI systems should be understood as material and resource-intensive infrastructures rather than purely digital entities. This perspective challenges the common perception of AI as a "clean" technology and underscores the need for a lifecycle approach to assessing its environmental impacts.

2.1 Environmental Justice Frameworks

Environmental justice provides a critical lens for analysing the distributional and procedural dimensions of environmental harm. Schlosberg (2007) identifies three core components of environmental justice: distribution, participation, and recognition. Distribution refers to the equitable allocation of environmental benefits and burdens, while participation emphasises the inclusion of affected communities in decision-making processes. Recognition involves acknowledging and respecting the identities and experiences of marginalised groups.

In the context of AI, these principles highlight the uneven distribution of environmental costs and benefits. For example, the extraction of minerals for AI hardware often occurs in regions with weak regulatory frameworks, where local communities bear the environmental and social costs (Crawford, 2021). At the same time, decision-making processes related to AI development and deployment are typically dominated by actors in developed countries, limiting the participation of affected communities.

Climate justice further extends these concerns by emphasising the global dimensions of environmental inequality. Developing countries, which have contributed least to climate change, are often the most vulnerable to its impacts (Roberts & Parks, 2007). The integration of AI into global economic systems risks exacerbating these inequalities unless appropriate regulatory measures are implemented.

2.2 AI Governance and Regulatory Challenges

The regulation of AI presents significant challenges due to its complexity, rapid evolution, and global nature. Existing regulatory frameworks are often fragmented and lack coherence, with different jurisdictions adopting varying approaches to AI governance (Wu & Liu, 2023). This fragmentation creates opportunities for regulatory arbitrage, where companies exploit differences in legal frameworks to avoid compliance.

Jobin et al. (2019) conducted a comprehensive analysis of AI ethics guidelines and found that while principles such as transparency, accountability, and fairness are widely endorsed, there is considerable variation in how these principles are interpreted and implemented. Moreover, environmental considerations are often absent from these frameworks, highlighting a significant gap in AI governance.

The European Union's proposed AI Act represents one of the most comprehensive attempts to regulate AI, focusing on risk-based classification and strict requirements for high-risk systems. However, critics argue that the Act does not adequately address environmental impacts, emphasising the need for more holistic regulatory approaches (Veale & Borgesius, 2021).

2.3 Integrating Environmental Law Principles into AI Regulation

Environmental law offers a well-established framework for addressing environmental risks and promoting sustainability. Key principles include the precautionary principle, the polluter pays principle, and the principle of public participation (Sands et al., 2018). These principles can be adapted to the context of AI to address its environmental impacts.

The precautionary principle, for example, advocates for preventive action in the face of uncertainty, making it particularly relevant for emerging technologies such as AI. Similarly, the polluter pays principle emphasises accountability for environmental harm, suggesting that companies responsible for AI-related environmental impacts should bear the costs of mitigation and remediation.

Public participation is another critical aspect of environmental law, ensuring that affected communities have a voice in decision-making processes. In the context of AI, this could involve greater transparency and stakeholder engagement in the development and deployment of AI systems.

2.4 Legal Practitioners and Environmental Justice

Legal practitioners play a central role in interpreting and implementing regulatory frameworks. Their perspectives provide valuable insights into the practical challenges of AI governance, including issues related to enforcement, compliance, and cross-border regulation. However, there is limited research focusing specifically on how legal practitioners perceive the environmental justice implications of AI.

Existing studies suggest that legal professionals are increasingly aware of the need to integrate environmental considerations into technology regulation. However, they also face significant challenges, including limited technical expertise, resource constraints, and the complexity of global supply chains (Wu & Liu, 2023).

2.5 Research Gap

While the literature on AI and environmental sustainability is expanding, several gaps remain. First, there is a lack of integration between environmental justice frameworks and AI governance. Second, existing studies often focus on technical or ethical aspects of

AI, with limited attention to legal perspectives. Third, there is a need for qualitative research that explores the perspectives of legal practitioners in greater depth.

This study addresses these gaps by adopting an interdisciplinary approach that combines environmental justice theory, legal analysis, and qualitative research methods. By focusing on the perspectives of legal practitioners, it provides a nuanced understanding of the challenges and opportunities in regulating AI for environmental justice.

3. Theoretical Framework

This study adopts an interdisciplinary theoretical framework that integrates environmental justice theory, climate justice, and socio-technical systems theory to critically analyse the regulation of artificial intelligence (AI) from a legal and environmental perspective. These frameworks collectively provide a normative and analytical basis for understanding how AI systems produce environmental harms, how these harms are distributed, and how legal mechanisms can address associated injustices.

3.1 Environmental Justice Theory

Environmental justice theory serves as the primary conceptual foundation for this study. Originating from social movements in the United States, the concept has evolved into a comprehensive theoretical framework addressing inequities in environmental governance (Schlosberg, 2007). Environmental justice emphasises three interrelated dimensions: distributive justice, procedural justice, and recognition justice.

Distributive justice concerns the equitable allocation of environmental benefits and burdens. In the context of AI, distributive inequalities manifest in the uneven distribution of environmental costs associated with resource extraction, energy consumption, and electronic waste disposal. For instance, the extraction of minerals required for AI hardware often occurs in developing countries, where environmental regulations are weaker, and communities are more vulnerable (Crawford, 2021). Meanwhile, the benefits of AI technologies, such as economic growth and technological innovation, are disproportionately concentrated in developed regions.

Procedural justice focuses on the fairness and inclusiveness of decision-making processes. AI governance is often characterised by a lack of transparency and limited public participation, particularly for communities directly affected by environmental harms. Legal practitioners have raised concerns about the exclusion of marginalised groups from policy discussions and regulatory processes, highlighting the need for more participatory approaches (Sovacool et al., 2021).

Recognition justice emphasises the need to acknowledge and respect the identities, knowledge systems, and experiences of marginalised communities. In AI governance, this dimension is particularly relevant in addressing the epistemic dominance of technologically advanced countries and corporations, which often

marginalise local knowledge and perspectives (Schlosberg, 2007).

3.2 Climate Justice

Climate justice extends environmental justice to the global scale, emphasising the disproportionate impacts of climate change on vulnerable populations and the ethical obligations of more developed nations (Roberts & Parks, 2007). The integration of AI into global economic and environmental systems raises important questions about its role in exacerbating or mitigating climate inequalities.

AI technologies have the potential to contribute to climate mitigation and adaptation, for example, through optimising energy systems, improving climate modelling, and enhancing resource management (Vinuesa et al., 2020). However, these benefits must be weighed against the environmental costs of AI systems themselves. The carbon footprint of large-scale AI models, for instance, raises concerns about their contribution to climate change (Strubell et al., 2019).

From a climate justice perspective, the key issue is whether AI development aligns with principles of equity and responsibility. Developed countries, which have greater technological capacity and have historically contributed more to climate change, bear a greater responsibility for ensuring that AI technologies are developed and deployed sustainably and equitably. This includes addressing the environmental impacts of AI supply chains and ensuring that vulnerable communities are not disproportionately affected.

3.3 Socio-Technical Systems Theory

Socio-technical systems theory provides a holistic framework for understanding AI as part of a broader system that includes technological infrastructure, human actors, institutions, and environmental resources (Geels, 2004). This perspective challenges the notion of AI as a purely technical artefact and instead situates it within complex networks of social and ecological interactions.

AI systems rely on extensive infrastructures, including data centres, communication networks, and energy systems. These infrastructures are embedded within specific socio-economic and environmental contexts, shaping and being shaped by regulatory frameworks, market dynamics, and cultural norms (Crawford, 2021). As such, the environmental impacts of AI cannot be fully understood without considering these broader systemic relationships.

Socio-technical systems theory also highlights the importance of co-evolution between technology and society. Regulatory frameworks, including environmental and AI laws, play a critical role in shaping this co-evolution by influencing how technologies are developed and used. Legal practitioners, therefore, are key actors within this system, contributing to the governance of AI and its environmental implications.

3.4 Integrative Analytical Framework

By combining these three theoretical perspectives, this study develops an integrative analytical framework for examining AI regulation. Environmental

justice theory provides a normative foundation for assessing fairness and equity, climate justice situates these concerns within a global context, and socio-technical systems theory offers a systemic understanding of AI and its impacts.

This integrated framework enables a comprehensive analysis of legal practitioners' perspectives, focusing on how they interpret and address the environmental justice implications of AI. It also facilitates the identification of gaps in existing regulatory frameworks and the development of more holistic and justice-oriented approaches to AI governance.

4. Methodology

This study employs a qualitative research design based on the analysis of secondary data. Qualitative research is particularly suited to exploring complex and emerging issues such as AI regulation and environmental justice, as it allows for an in-depth examination of perspectives, interpretations, and contextual factors (Creswell & Poth, 2018).

The use of secondary data enables the study to draw on a wide range of existing sources, including academic literature, legal documents, and policy reports. This approach is appropriate given the exploratory nature of the research and the limited availability of primary data on legal practitioners' perspectives in this specific domain.

4.1 Data Sources and Selection Criteria

The study utilises multiple types of secondary data to ensure a comprehensive and triangulated analysis. These include:

- Peer-reviewed journal articles on AI, environmental justice, and legal regulation
- Policy documents and regulatory frameworks (e.g., EU AI Act, OECD AI Principles)
- Reports from international organisations and think tanks
- Legal commentaries and interdisciplinary studies

A systematic literature selection process was employed to identify relevant sources. Inclusion criteria included:

- Relevance to AI regulation, environmental sustainability, or environmental justice
- Publication in reputable academic journals or by recognised institutions
- Availability in English
- Publication within the last 10–15 years, with some foundational works included

This approach aligns with qualitative secondary research methodologies, which emphasise rigour, transparency, and relevance in data selection (Johnston, 2017).

4.2 Data Analysis: Thematic Analysis

The study adopts thematic analysis as its primary analytical method. Thematic analysis is a widely used qualitative

technique for identifying, analysing, and interpreting patterns within data (Braun & Clarke, 2006). It is particularly suitable for synthesising diverse sources and extracting key themes related to legal practitioners' perspectives.

The analysis followed a six-step process:

- **Familiarisation with the data**: Reviewing and reading selected documents to gain an overall understanding
- **Initial coding**: Identifying relevant segments of text and assigning codes related to key concepts (e.g., accountability, environmental harm, regulatory gaps)
- **Theme development**: Grouping codes into broader themes such as environmental externalities, procedural justice, and regulatory challenges
- **Reviewing themes**: Refining themes to ensure coherence and consistency
- **Defining and naming themes**: Clearly articulating the meaning and scope of each theme
- **Interpretation**: Linking themes to the theoretical framework and research objectives

This iterative process allows for a nuanced understanding of the data and facilitates the integration of multiple perspectives.

4.3 Analytical Focus: Legal Practitioners' Perspectives

Although the study relies on secondary data, it specifically focuses on sources that reflect or analyse the perspectives of legal practitioners, including judges, lawyers, policymakers, and legal scholars. These perspectives are inferred from:

- Legal analyses and commentaries
- Policy critiques and recommendations
- Case law discussions (where available)

This approach acknowledges that legal practitioners' perspectives are often embedded within broader legal and academic discourse.

4.4 Validity and Reliability

Ensuring the validity and reliability of qualitative research is critical. This study employs several strategies to enhance rigour:

- **Triangulation**: Using multiple data sources to corroborate findings
- **Transparency**: Clearly documenting the data selection and analysis process
- **Theoretical grounding**: Anchoring the analysis in established theoretical frameworks
- **Reflexivity**: Acknowledging the interpretive nature of qualitative analysis

These measures help to ensure that the findings are credible, consistent, and grounded in the data (Creswell & Poth, 2018).

4.5 Limitations

While secondary data analysis offers several advantages, it also has limitations. The study relies on existing literature and may not capture the most current or context-specific

perspectives of legal practitioners. Additionally, the interpretation of secondary data may introduce bias, as it depends on the researcher's analytical lens.

Future research could address these limitations by incorporating primary data through interviews or surveys with legal practitioners, providing more direct insights into their perspectives.

4.6 Ethical Considerations

As this study is based on publicly available secondary data, it does not involve direct interaction with human participants and therefore does not require formal ethical approval. However, ethical considerations were observed in the accurate representation of sources, proper citation, and avoidance of plagiarism (Mannan & Farhana, 2026).

5. Findings and Analysis

This section presents the key findings derived from the thematic analysis of secondary data, focusing on legal practitioners' perspectives regarding the regulation of artificial intelligence (AI) for environmental justice. The findings are organised into five major themes: fragmentation of regulatory frameworks, environmental externalities and accountability gaps, procedural justice and participation deficits, enforcement and jurisdictional challenges, and emerging legal innovations and adaptive governance strategies.

5.1 Fragmentation of AI Regulatory Frameworks

One of the most consistent findings across the literature is the fragmented nature of AI regulation. Legal practitioners frequently highlight the absence of a unified global regulatory framework, resulting in a patchwork of national and regional policies (Wu & Liu, 2023). This fragmentation is particularly problematic for environmental governance, as AI systems operate across borders and rely on global supply chains.

For example, while the European Union has taken a proactive approach through the proposed AI Act, other jurisdictions have adopted more laissez-faire regulatory models. This divergence creates inconsistencies in how environmental impacts are addressed. Legal practitioners argue that such fragmentation allows corporations to engage in regulatory arbitrage, shifting environmentally harmful activities to jurisdictions with weaker environmental protections (Veale & Borgesius, 2021).

Moreover, existing AI regulations tend to prioritise ethical concerns such as data protection, algorithmic bias, and transparency, while largely neglecting environmental considerations (Jobin et al., 2019). This reflects a broader tendency within technology regulation to separate environmental issues from digital governance, despite their increasing interdependence.

5.2 Environmental Externalities and Accountability Gaps

A central concern identified by legal practitioners is the lack of clear accountability mechanisms for the environmental externalities associated with AI systems. These externalities include

carbon emissions, water usage, and ecological degradation resulting from resource extraction and electronic waste.

From a legal perspective, attributing responsibility for these impacts is inherently complex. AI systems involve multiple actors, including developers, hardware manufacturers, cloud service providers, and end-users. This distributed responsibility complicates the application of traditional legal principles such as liability and causation (Crawford, 2021).

The "polluter pays" principle, a cornerstone of environmental law, is often difficult to लागू in the context of AI due to the diffuse nature of environmental harms. Legal practitioners note that current regulatory frameworks lack mechanisms for tracing and assigning responsibility across the AI lifecycle (Sands et al., 2018).

Furthermore, the opacity of AI systems exacerbates accountability challenges. Proprietary algorithms and limited transparency make it difficult for regulators to assess environmental impacts and enforce compliance. This creates a situation in which environmental harms remain largely externalised, with limited legal recourse for affected communities.

5.3 Procedural Justice and Participation Deficits

Procedural justice emerged as a critical theme in the analysis, with legal practitioners emphasising the importance of inclusive and participatory governance. However, current AI regulatory processes often fail to provide meaningful opportunities for public engagement, particularly for marginalised communities.

Decision-making related to AI development and deployment is typically dominated by governments, corporations, and technical experts. This concentration of power limits the ability of affected communities to influence regulatory outcomes (Sovacool et al., 2021). Legal practitioners argue that this lack of participation undermines the legitimacy and effectiveness of AI governance.

In the context of environmental justice, procedural fairness requires not only access to information but also the ability to participate in decision-making processes. This includes public consultations, stakeholder engagement, and mechanisms for community input. However, such mechanisms are often absent or insufficient in AI governance frameworks.

Additionally, the technical complexity of AI poses a barrier to participation. Legal practitioners highlight the need for capacity-building initiatives to enhance public understanding of AI and its environmental implications. Without such efforts, participation risks becoming symbolic rather than substantive.

5.4 Enforcement and Jurisdictional Challenges

Enforcement represents one of the most significant challenges in regulating AI for environmental justice. The global and decentralised nature of AI systems complicates the application of national laws and regulatory mechanisms.

Legal practitioners point out that AI development often involves transnational supply chains, with different components of the system located in different jurisdictions. This creates difficulties in determining which legal framework applies and how regulations can be enforced (Wu & Liu, 2023).

Moreover, enforcement mechanisms are often weak or underdeveloped. Regulatory agencies may lack the technical expertise and resources needed to monitor AI systems and assess their environmental impacts. This is particularly true in developing countries, where regulatory capacity is limited.

Another challenge is the lack of standardised metrics for measuring the environmental impact of AI. Without clear benchmarks, it is difficult to establish compliance or hold actors accountable. Legal practitioners emphasise the need for internationally recognised standards and reporting requirements.

5.5 Emerging Legal Innovations and Adaptive Governance

Despite these challenges, the analysis also reveals emerging legal innovations aimed at addressing the environmental impacts of AI. Legal practitioners are increasingly advocating for the integration of environmental considerations into AI governance frameworks.

One promising approach is the adoption of lifecycle assessments for AI systems, which evaluate environmental impacts from production to disposal. This approach aligns with environmental law principles and provides a more comprehensive understanding of AI's ecological footprint (Crawford, 2021).

Another innovation is the development of sustainability reporting requirements for AI companies. Such requirements would enhance transparency and enable regulators and stakeholders to assess environmental performance.

Adaptive governance models are also gaining traction, emphasising flexibility, learning, and stakeholder engagement. These models recognise the dynamic nature of AI technologies and the need for regulatory frameworks that can evolve.

6. Discussion

The findings of this study underscore the urgent need to reframe AI regulation through the lens of environmental justice. This section interprets the findings in relation to the theoretical framework and broader literature, highlighting key implications for law, policy, and governance.

6.1 Reframing AI as an Environmental Justice Issue

A central insight of this study is the need to reconceptualise AI as an environmental justice issue rather than merely a technological or ethical concern. The environmental impacts of AI, ranging from resource extraction to energy consumption, are deeply intertwined with social and economic inequalities.

Environmental justice theory provides a valuable framework for understanding these dynamics. The findings reveal significant distributive inequalities, with environmental

burdens disproportionately affecting marginalised communities. This aligns with existing research on global environmental inequality (Roberts & Parks, 2007).

Moreover, the lack of procedural justice in AI governance highlights the exclusion of affected communities from decision-making processes. Addressing these issues requires a fundamental shift in how AI is conceptualised and regulated, moving beyond narrow technical considerations to encompass broader social and environmental concerns.

6.2 Integrating Environmental Law Principles into AI Governance

The study highlights the potential of environmental law principles to inform AI regulation. The precautionary principle, for example, is particularly relevant in the context of AI, where uncertainties about environmental impacts are significant.

Applying the precautionary principle would require regulators to take proactive measures to prevent environmental harm, even in the absence of complete scientific certainty (Sands et al., 2018). This could involve stricter requirements for environmental impact assessments and greater oversight of high-risk AI systems.

The polluter pays principle also offers a framework for addressing accountability gaps. By assigning responsibility for environmental harms to those who cause them, this principle could help internalise the external costs of AI systems. However, its implementation would require new legal mechanisms for tracing and attributing responsibility across complex supply chains.

Public participation is another key principle that can enhance the legitimacy and effectiveness of AI governance. Ensuring meaningful stakeholder engagement would help address procedural justice deficits and promote more inclusive decision-making processes.

6.3 Addressing Global Inequalities and the Role of the Global South

The findings underscore the importance of addressing global inequalities in AI governance. The environmental impacts of AI are often externalised to developing countries, which lack the regulatory capacity to manage these challenges effectively.

From a climate justice perspective, developed countries have a responsibility to ensure that AI technologies are developed and deployed in a manner that does not exacerbate global inequalities (Roberts & Parks, 2007). This includes providing financial and technical support to developing countries and promoting equitable access to the benefits of AI.

In the context of Bangladesh and similar countries, these issues are particularly salient. Rapid industrialisation, combined with limited regulatory capacity, creates vulnerabilities to environmental harm. Integrating AI into such contexts requires careful consideration of local conditions and priorities.

6.4 The Evolving Role of Legal Practitioners

Legal practitioners play a critical role in shaping AI governance, acting as intermediaries between technological

innovation and regulatory frameworks. The findings suggest that legal professionals are increasingly aware of the environmental implications of AI and are advocating for more comprehensive regulatory approaches.

However, they also face significant challenges, including limited technical expertise and the complexity of AI systems. Addressing these challenges requires interdisciplinary collaboration between legal experts, technologists, and environmental scientists.

Legal education and training must also evolve to equip practitioners with the knowledge and skills needed to address emerging issues in AI governance. This includes integrating environmental and technological perspectives into legal curricula.

6.5 Toward Adaptive and Integrated Governance

The complexity and dynamism of AI systems necessitate adaptive governance approaches that can respond to evolving challenges. Traditional regulatory models, which rely on static rules and rigid frameworks, are ill-suited to the rapidly changing landscape of AI.

Adaptive governance emphasises flexibility, learning, and stakeholder engagement, enabling regulators to respond to new information and changing conditions (Geels, 2004). This approach is particularly relevant for addressing the environmental impacts of AI, which are often uncertain and context-dependent.

Integrating environmental justice into adaptive governance frameworks can enhance their effectiveness by ensuring that equity and sustainability are central considerations. This requires ongoing monitoring, evaluation, and stakeholder engagement.

6.6 Policy Implications

The findings of this study have several important policy implications:

- **Development of integrated regulatory frameworks** that address both ethical and environmental aspects of AI
- **Implementation of lifecycle assessments and sustainability reporting** for AI systems
- **Strengthening international cooperation** to address transboundary environmental impacts
- **Enhancing public participation and transparency** in AI governance
- **Building regulatory capacity in developing countries**

These measures can help align AI governance with environmental justice principles and promote more sustainable and equitable outcomes.

7. Conclusion

This study has critically examined the regulation of artificial intelligence (AI) through the lens of environmental justice, with a particular focus on the perspectives of legal practitioners. The findings underscore a fundamental disconnect between the rapid advancement of AI technologies and the

capacity of existing legal frameworks to address their environmental and social implications. While AI is frequently positioned as a tool for sustainability and innovation, its lifecycle impacts, ranging from resource extraction and energy consumption to electronic waste, reveal a complex web of environmental externalities that are unevenly distributed across global populations.

A key contribution of this research lies in highlighting the fragmented nature of AI regulation. Current governance frameworks, as identified in the analysis, are largely centred on ethical principles such as transparency, fairness, and accountability, yet they insufficiently incorporate environmental considerations. This gap is particularly problematic in light of the distributive injustices associated with AI systems, where environmental burdens are disproportionately borne by marginalised communities, especially in developing countries. The study thus reinforces the relevance of environmental justice theory in understanding and addressing these inequities.

The research also demonstrates the value of integrating environmental law principles into AI governance. Concepts such as the precautionary principle, the polluter pays principle, and public participation provide a robust normative foundation for regulating AI in a manner that promotes sustainability and equity. However, the application of these principles requires significant adaptation to account for the unique characteristics of AI systems, including their opacity, complexity, and transnational nature.

Another important finding is the evolving role of legal practitioners in shaping AI governance. As intermediaries between technological innovation and regulatory systems, legal professionals are increasingly recognising the need for interdisciplinary approaches that bridge law, technology, and environmental science. Nevertheless, they face considerable challenges, including limited technical expertise, resource constraints, and the difficulties of enforcing regulations across jurisdictions.

The study further highlights the importance of addressing global inequalities in AI governance. From a climate justice perspective, the environmental impacts of AI must be understood within broader patterns of global inequality, where the benefits of technological advancement are concentrated in developed regions while the costs are externalised to the Global South. This underscores the need for international cooperation, capacity-building, and equitable policy frameworks.

In conclusion, regulating AI for environmental justice requires a paradigm shift toward more integrated, adaptive, and justice-oriented governance models. Policymakers must move beyond narrow ethical frameworks to incorporate environmental and social dimensions, ensuring that AI technologies contribute to sustainable development rather than exacerbating existing inequalities. Future research should build on this study by incorporating primary data from legal practitioners and exploring context-specific regulatory strategies, particularly in developing countries. By aligning AI

governance with environmental justice principles, it is possible to harness the transformative potential of AI while safeguarding ecological integrity and social equity.

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