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**SUSTAINABLE GOVERNANCE OF AI-ENABLED REMOTE SENSING
SYSTEMS FOR ENVIRONMENTAL COMPLIANCE: NEED FOR A
DEDICATED LEGAL FRAMEWORK IN INDIA**

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ABSTRACT

The pace of advancements in Artificial Intelligence (AI) and Remote Sensing technologies has brought significant evolution in the realm of environmental compliance in India, allowing more advanced applications in the areas of pollution detection, land use analysis, and environmental degradation assessments in real-time applications. The current environmental legal framework in India - that is, Environmental Protection Act, Air Act, Water Act, and Environmental Impact Assessment Notification - are not designed in a manner that the use of AI surveillance or data analysis or enforcement actions can be regulated or governed. At the same time, the current governance structure over AI applications in various domains is quite unorganized or fragmented and not clear or defined in terms of accountability or accuracy or integrity of data or use of evidence generated from AI applications. The methodology used for this research is doctrinal research.

This research recommends the formation of a specialized legal structure in respect of the responsible use of AI-enabled remote sensing technologies in the context of environmental regulation. The legal structure should incorporate the following key areas: (i) well-defined terms regarding data gathering, processing, and authentication; (ii) accountability procedures regarding errors and ‘false positives’ arising from AI applications; (iii) privacy and safeguard measures relying upon the Digital Personal Data Protection Act; (iv) rules regarding open access in ‘algorithmic’ decision-making; and (v) guidelines regarding the use of evidence from AI in legal and administrative proceedings. The specialized legal structure may be formed through the creation of an ‘independent Environmental Technology and AI Regulatory

Authority,' ensuring harmonious technological progress in consonance with the constitutional system and tenets of environmental justice.

With the push towards a more rights-oriented, ethically-based, and sustainability-focused approach, there clearly exists a burning need to incorporate AI powers of remote sensing in responsible regulatory infrastructure in India.

Keywords: Artificial Intelligence, Remote Sensing, Environmental Compliance and Sustainability, Legal Framework, India.

INTRODUCTION

The increased levels of developmental pressures, complex land-use dynamics, and the vast geographical extent of Indian ecosystems make traditional inspection-oriented approaches to environmental enforcement relatively less effective.¹ The use of remote sensing technologies consisting of satellite imagery, aerial photographs, and Unmanned Aerial Vehicles (UAVs or 'drones'), in combination with Artificial Intelligence (AI) approaches toward automated detection and prediction, equips enforcer agencies with the capacity to surveil vast areas of land mass, detect nascent dangers, and allocate enforcement efforts more effectively. From the perspective of sustainable governance, such technologies are aligned toward meeting objectives of smarter decision-making through improved data availability, improving capacities to protect air, water, forest, wetland, and coastal ecosystems.

The synergies between Artificial Intelligence (AI) and Remote Sensing in the context of environmental regulatory frameworks create legal and ethical challenges that are not exhaustively dealt with under current Indian laws.² The sectoral laws like Environment Impact Assessment (EIA) Notification provide the legal umbrella under which environmental clearances and enforcement follow; however, such laws are antecedent to the employment of algorithmic surveillance and do not incorporate guidelines criteria regarding the admission and governance of AI-generated evidence. The civil air laws and the Drone Rules of 2021 pertain to the use of Unmanned Aerial Vehicles (UAV), but there are no stipulations regarding the

¹ Varsha Singh and Amit Kumar Singh, "AI and Environmental Monitoring in India: Legal Frameworks for Automated Enforcement" 5 *International Journal of Law, Justice and Jurisprudence* 157 (2020).

² Dileep Kumar Singh, "Regulating the Regulators: Legal and Ethical Frameworks for the Use of AI in Environmental Monitoring and Compliance" 3 *The Academic-International Journal of Interdisciplinary Research* 968 (2025).

parameters of programmable use under the umbrella of environmental enforcement. The Digital Personal Data Protection Act of 2023 pertains to the governance of personal data, but leaves undecided the complex legal questions regarding the interpretation of geospatial environmental datasets possibly holding personal identifiers or impacting community interests.³ The national AI strategy in India recommends sectoral use but does not come under the definition of legal instruments regarding accountability or employing applications of AI in administrative procedures. The various piecemeal laws in this context create legal ambiguities regarding when and how algorithmic outputs may be utilized in the enforcement process initiation stage, legal frameworks regarding privacy and community interests' protection, and legal liabilities in situations of errors in administrative algorithms.

BACKGROUND

The current state of literature and regulatory discourse engages with aspects of the AI and Remote Sensing nexus, but generally crosses disciplinary or sectoral lines. The technological inquiry focuses on research opportunities in change detection analysis, land coverage mapping, or pollution plume tracking.⁴ The legal-policy literature investigates the feasibility of introducing satellite image evidence in courts, data privacy in geographical data repositories, or the possible existence of algorithmic bias. The domestic regulative framework's attention towards AI focuses under the 'National Strategy for Artificial Intelligence' recommended under NITI Aayog's guidelines in favour of AI use in essential social sectors like farming and the environment. The Drone Rules, 2021 relaxed UAV use in Indian airspace, and the Digital Personal Data Protection Act, 2023 provides statutory aid regarding personal data processing. The judicial system's tribunals like the 'Supreme Court' and 'National Green Tribunal,' in particular, have allowed digital image and satellite data in environmental proceedings with requirements of authentication and proof of 'chain of custody.'⁵ Recent tribunal session opinions and experiences underscore immediate challenges in resolution quality inherent in use of 'satellite images,' or 'confounding factors' like 'cloud coverage' or 'seasonal land use

³ Prabhat Kumar Mishra and Shashikant Tripathi, "Artificial Intelligence in Environmental Governance: Legal and Ethical Challenges for India" 7 *International Journal for Multidisciplinary Research* 2 (2025).

⁴ Shashwata Sahu, Navonita Mallick and Imran Hossain, *Regulating the Future: Policy Frameworks for AI in Environmental Monitoring and Governance*, in *Addressing Environmental Challenges with AI, Robotics, and Augmented Reality* 83–112 (IGI Global, 1st edn., 2024).

⁵ Dr. Ziaul Islam, Dr. Ashfaq Ahmed, Dr. Mohammed H Alfify and Nida Riyaz, "The Impact Of Artificial Intelligence on Environment and Sustainable Development In India", 30 *Educational Administration: Theory and Practice* 1850 (2024).

patterns,’ and admission that there have been situations in which ‘distinguishing lawful from unlawful use’ in images caused challenges.⁶

The research reveals that despite the rapid development of AI-enabled remote sensing technology, there is still a problem with inadequate and fragmented governance instruments. This is evident from the use of international instruments, such as the EU Artificial Intelligence Act and the General Data Protection Regulation (GDPR), which provide risk-based regulation and safeguards concerning automated decision-making and data protection. Conversely, India’s legal framework fails to offer adequate provisions related to algorithmic accountability and explainability in environmental enforcement.

RESEARCH PROBLEM

Despite the quick integration of AI-enabled remote sensing systems like satellite change detection analysis, aerial surveillance via drones, and AI-powered environmental risk modeling in India, there remains no unified legal structure in place that may otherwise appropriately regulate the use of such technologies in matters of environmental compliance. The current legal structure in this regard includes various laws like the Environment (Protection) Act of 1986, the Environment Impact Assessment Notification of 2020 commonly referred to as the EIA Notification of 2020, the Drone Rules 2021, and the Digital Personal Data Protection Act 2023. These laws are only able to appropriately regulate selective aspects of this technological infrastructure but do not do anything significant towards mitigating the important facets arising out of the use of AI-powered algorithmic surveillance in environmental matters. These include the unknown or material evidence-gathering capacities of AI-powered surveillance inputs in environmental matters, the lack of standard procedures and guidelines under which data may be sourced using such technologies in matters of environmental compliance, and possible lapses in data privacy or communal or environmental justice. The central research issue in this context would therefore be the evolution of a pro-environment and constitutionally compliant and harmonious legal system under which the use of AI-enabled remote sensing technologies in India would also be promoted.

RESEARCH OBJECTIVES

⁶ *Supra* note. 4

1. To effectively analyze the prevailing legal framework in India regarding remote sensing, artificial intelligence, and data protection in context to their applications in environmental compliance.
2. To discern important legal, technical, and institutional complexities involved in implementing AI-based remote sensing systems to enforce environmental matters, taking into account concepts related to accountability, privacy, and governance fragmentation.
3. To introduce an exclusive legal and governance framework that enables sustainable, transparent, and rights-based utilization of AI-based remote sensing systems for environmental compliance in the Indian context.

RESEARCH METHODOLOGY

This research has employed doctrinal and comparative legal methodology for research purposes. The doctrinal aspect is about analysing primary sources of law like the Environment (Protection) Act, 1986; the Drone Rules, 2021; the Digital Personal Data Protection Act, 2023; Remote Sensing Data Policy, 2011; and judicial pronouncements of the Supreme Court of India. Also, secondary sources of law on the regulation of AI technology and geospatial technology have been analysed. This includes scholarly articles, policy reports, and international regulatory instruments.

The comparative element assesses the relevant international regulations, especially the EU Artificial Intelligence Act, the General Data Protection Regulation (GDPR), and the environmental monitoring systems employed by bodies like the US Environmental Protection Agency (EPA). The research methodology also employs a limited case study based on Deepor Beel in Assam to analyze the real-world impacts of AI-supported remote sensing technology for environmental management.

Using a combined doctrinal-comparative approach will allow for a wider examination of the legal, institutional, and ethical concerns raised by the use of AI-based environmental monitoring systems in India.

EXISTING LEGAL AND POLICY FRAMEWORK IN THE INDIAN CONTEXT

1. Remote Sensing Data Policy 2011

The India Remote Sensing Data Policy (RSDP) of 2011⁷ regulates the acquisition and dissemination of remote sensing data and provides modalities for the grant of permission for the acquisition and dissemination of the imagery and the products derived therefrom. This policy has taken into consideration the strategic issues concerning the national security of the country while allowing development-related use. However, the RSDP of 2011 is antecedent to the development of commercial high-resolution images and the use of drones and the current AI models.⁸

2. Geospatial Data Guidelines (2021) & Drone Rules (2021)

The Drone Rules, 2021, alongside other regulations such as the guidelines for the acquisition and production of geospatial data, made it easier to access geospatial data and facilitated licensing for many mapping-related tasks. However, there are still no comprehensive mechanisms for artificial intelligence analysis of geospatial data, and there is also a lack of requirements with regard to algorithmic auditability and transparency. This is in spite of the fact that many applications of artificial intelligence and geographic information systems are still in their infancy.⁹

3. Laws and Compliance Procedures - Environmental Laws

The environmental legislative framework in India consists of Environment (Protection) Act, Water (Prevention & Control of Pollution) Act, Air (Prevention & Control of Pollution) Act, Forest (Conservation) Act, and EIA Notification of 2006, and all are susceptible to various amendments from time to time. All of them collectively articulate the framework of authorization and compliance. Remote-sensing techniques have started to be used as investigation and monitoring tools by environmental authorities. In current procedural norms, human inspection is often presumed to exist, and no stipulation is provided regarding the evidentiary basis to be assigned to the results of algorithms and the necessity of independent verification of observations before taking further actions and levying penalties.¹⁰

4. Instruments of Data Protection and AI Policies

⁷ Malay Adhikari, "Remote Sensing: An Analysis of Policy and Law with Reference to India", available at <http://indiageospatialforum.org/2012/proceedings/ppt/Malay%20Adhikari.pdf> (last visited on 12/12/2025)

⁸ Remote Sensing Data Policy (RSDP – 2011), available at: <https://lib.icimod.org/records/q0par-4b692> (last visited on December 29, 2025).

⁹ The Drone Rules, 2021, available at:

<https://static.pib.gov.in/writereaddata/specificdocs/documents/2022/jan/doc202212810701.pdf> (last visited on December 29, 2025).

¹⁰ Amit Amar Soren and Shaweta Singh, "An Analysis of Policies and Implementation of Environmental Legislation and Green Governance in India" 7 *The Rubrics – Journal of Interdisciplinary Studies* 6 (2025).

The Digital Personal Data Protection Act in India, passed in 2023, regulates the processing of digital personal data, which confers certain fiduciary duties. There are similarly NITI AI strategies, along with the debate on “Responsible AI,” which call for industry-specific frameworks, classifications, auditing, and risk-focused approaches on AI. All the above afford a productive basis for the governance on privacy and AI. However, the following specifically are the gaps that appear when such regulatory frameworks are considered regarding geospatial data or environmental enforcement: what constitutes “personal data” within the context of high-resolution maps or images, proportionality within the environmental public interest concerning individual rights, or third-party analytics service providers.¹¹

LEGAL, TECHNICAL, AND GOVERNANCE CHALLENGES IN AI-DRIVEN REMOTE SENSING

Case Law Analysis: Judicial Approaches Towards Digital and Environmental Evidence

Satellite imaging and digital data have become common features of Indian legal systems, especially in environmental cases. This was seen when the Supreme Court highlighted the use of satellite data in forestry and environmental issues during its decision in *T.N. Godavarman Thirumulpad v. Union of India*¹². The National Green Tribunal used satellite images and evidence from drones in a number of cases concerning wetlands and unauthorized mining. This helped courts detect any encroachment and destruction of the environment. In *Goa Foundation v. Union of India*¹³, the Supreme Court reviewed the matter of illegal mining operations in Goa and referred to environmental impact assessments, GIS maps, and scientific papers for the assessment of ecological harm and violation of law.

Judicial perspective suggests that although Indian courts are willing to consider environment management aided by technology, they are still apprehensive about the accuracy and legitimacy of processes behind the AI output. There is an evident gap between technological efficiency and procedural justice. While the AI Act in the European Union mandates explainability and human supervision in high-risk AI activities, there are currently no standards in India to ensure this for AI-aided environment management processes.

Some of the legal, technical, and governance challenges in AI-driven remote sensing involves:

1. Data Governance and Privacy Risks

¹¹ The Digital Personal Data Protection Act, 2023 (Act 22 of 2023).

¹² (1997) 2 SCC 267

¹³ (2014) 6 SCC 590

High-resolution imagery may provide detail about identifiable individuals (such as employees or domestic activities) or facilitate re-identification based on additional datasets. The DPDP Act regulates digital personal data but is, as a matter of current interpretation, agnostic regarding the applicability of the regulation to the specific type of geospatial data obtainable by satellite or drone imaging. In other words, whether the inferences generated by the analysis of the data (e.g., the very likely illegal dumping of pollutants emanating from a given facility) should be considered personal data is currently an open question under the existing legal framework. The existing RSDP and Geospatial guidelines fail to provide specific consideration for the issue of consent, minimization, retention, and purposes of AI products developed for the purpose of compliance.

2. Algorithmic Transparency, Explainability and Auditability

AI systems used by the regulatory community need to be auditable and explainable to ensure the tenets of fairness and due process are met. The existing framework of law does not require the validation dataset to be disclosed, the rate of errors, the source of the training data used to develop the algorithm, or an independent audit prior to using the AI result as a reason for enforcement action. Proprietary AI systems that act as ‘black boxes’ present challenges to traditional evidentiary and administrative law traditions.¹⁴

3. Responsibility, Liability, and Enforcement

This involves who could be liable for the improper outputs from the AI that led to improper enforcement actions. There are various people who could potentially be liable for the same. These include the model developers (analytics companies), the data providers (operators of satellites and drones), and the regulatory body that was using the output. There are no clear laws surrounding liability for errors in environmental algorithms.¹⁵

4. Interoperability, Standards, and Certification

Without common technical and metadata interoperability standards, different agencies and companies produce data and models that are not interoperable. As of present, no certification exists regarding the use of artificial intelligence risk assessment and compliance (AI-RS) systems.

5. Environmental Justice, Access, and Consent

¹⁴ Can AI Be Auditable?, available at: <https://arxiv.org/abs/2509.00575> (last visited on December 29, 2025).

¹⁵ Louisa McDonald, “AI Systems and Liability: An Assessment of the Applicability of Strict Liability & A Case for Limited Legal Personhood for AI”, 3 *University of St Andrews Law Journal* 21 (2023).

The use of remote sensing technology by the government has potential benefits for the common good. However, various communities, especially the vulnerable, could be affected by over-targeting or surveillance. Taking a purely technical view on the use of AI-enabled remote sensing (AI-RS) technology could lead to imbalanced outcomes.

6. Legal and evidentiary status of AI-derived remote sensing outputs

Weight of Evidence: There are no specific provisions in the Indian legal system to deal with the admission, weightage, and status of remote sensing data processed using AI algorithms (e.g. classified maps, change detection notifications). The courts demand factors like custody and trustworthiness, which are not explicitly defined in case of data processed by AI¹⁶.

Accuracy and Auditability Standards: There is currently no statute stating that AI systems used in environmental compliance must meet standards regarding error rates or independent audits.

Data governance tensions: openness versus privacy and security

Data Access: Wherein the Remote Sensing Data Policy (RSDP), as well as the National Remote Sensing Center (NRSC), have defined criteria for accessing data, this access remains limited in practice for third-party organizations and researchers wanting access to high-resolution images necessary for enforcement use.

Privacy: High-resolution and drone imagery can potentially depict individuals and their private activities, thus activating the provisions of DPDP and associated risks of mass surveillance, unless sufficient safeguards are put in place.

Algorithmic Bias, Transparency, and Governance: There is the possibility of misclassification of models based on an unrepresentative data set (e.g., the misclassification of wetland vegetation versus agricultural fields). At present, there is no requirement mandated by the industry concerning model cards and data provenance.

7. Fragmentation of institutions and capacity constraints

Various entities such as the Ministry of Environment, Forest, and Climate Change (MOEFCC), State Environmental Impact Assessment (SEIA) cells, Indian Space Research Organisation/ National Remote Sensing Centre (ISRO/NRSC), and several ministries in the Government of India overlap in terms of responsibilities, with a lack of coordination among entities on AI-

¹⁶ Deepanker Singha and Pragya Narang, "AI-Generated Evidence in Indian Courts: Admissibility, Reliability and the Chain of Custody Challenge" 5 *Indian Journal of Integrated Research in Law* 186 (2025).

based environmental observation. The availability of capabilities to make sense of the results from the use of AI varies across the enforcement agencies.

8. Responsibility and compensation

The question of the accountability for the unjust enforcement operative outputs or actions stemming from the automated results also remains unanswered. In the event of not specifically attributing responsibility to the relevant parties, there may be a lack of use of these tools by the agencies.

CASE STUDY: DEEPOR BEEL - FROM DETECTION TO ENFORCEMENT

In the context of the Deepor Beel wetland site, which is designated under Ramsar Convention and situated in Assam, the application of satellite imaging and AI-powered image classification can help in the identification of illegal encroachments, shrinkage of wetlands, destruction of vegetation, and unauthorized land use conversions over time. International environmental regulatory agencies like the United States Geological Survey (USGS) also highlight the increasing adoption of machine learning and AI-powered geospatial data analysis for ecological monitoring purposes.

On the other hand, the Deepor Beel example also shows how AI technology is constrained by laws and institutions in India. Automated algorithms are susceptible to errors due to seasonal changes, clouds, and poor training data sets. Moreover, environmental authorities also fail to adopt a consistent protocol for on-ground testing and review of algorithmic procedures. Without proper evidence standards regarding AI-generated reports, any automated conclusion can be contested on issues of procedural and technical accuracy.¹⁷

PROPOSAL: CORE ELEMENTS OF A DEDICATED LEGAL FRAMEWORK

The sector-wide legal system, in whatever form of legislation—stand-alone Act/regulation or set of amendments and sub-regulations- should embrace the following elements:

1. Purpose, scope and definitions

Use definitions like “AI-enabled remote sensing systems,” “environmental compliance use,” and “data controller/processor” consistent with DPDP definitions, distinguishing where the remotely sensed data may not be personal data.

¹⁷ Sameer Mandal, Kasturi Chakraborty and Biman Kr. Dutta, “Evaluation of the Influence of Land-Use and Land-Cover Changes on Ecosystem Services in Deepor Beel Ramsar Site Using High Resolution Remote Sensing” 126 *Current Science* 1159 (2024).

2. Data access, licensing, and layering of openness

Open environmental layer: Require public access to environmental indices and maps produced by remote sensing for public purposes (basic land cover change maps at given scales) and retain the filtering of higher-resolution data for national security reasons and strictly defined terms. These environmental layers would leverage the open data initiatives that ISRO/NRSC have already established for remote sensing data.

3. Data protection and privacy safeguards

In contexts where imagery may potentially reveal individuals and/or their activities, a set of conditions including data minimization, purpose limitation, standards of anonymization/aggregation, and DPIA-like assessments of environmental impact should be required to conform to the principles of DPDP.

4. Technical Standards and Accreditation

Comparative International Frameworks: There could be some comparative lessons to learn from the international framework like the European Union Artificial Intelligence Act, which is concerned about transparency, risk categorization, human supervision, and conformity assessment for high-risk AI. In the same way, the principles of AI by OECD are concerned about accountability, explainability, and human-centric approach. Integrating these comparative practices within the Indian scenario will give legitimacy to the entire process of environmental governance through AI.

Also, it is important to develop national technical standards regarding accuracy levels, confusion matrix formats, validation procedures, and minimum ground truth sampling, as well as a registration system of certified AI models regarding environmental compliance. Model cards, training datasets or descriptions in case of proprietary datasets, and versioning should be required. Third-party auditability should be obligatory in case of models directly activating enforcement procedures.

5. Procedural safeguards for enforcement use

Mandate that the results of automated systems cannot be the sole reason for punitive actions to occur; that human-in-the-loop verification must occur before punitive action is taken. Include guidelines on the timeframes and process associated with contesting the results of automated systems.

6. Liability, accountability and remedial mechanisms

Describe liability allocation: Liability allocation is where operators must maintain logs, offer explainability reports, and offer indemnities; vendors who offer flawed models used in bad faith may also have to pay corrective costs. Together, these principles form a code that governs how operators must work when utilizing deep learning techniques.

7. Transparency, public participation, and data stewardship

Mandate the publication of environmental indices and methods used, as well as the mechanisms for redress. Also promote community-based environmental monitoring projects that have the ability to provide ground-truth verification and dispute the data.

8. International and technical cooperation

Introduce procedures to follow international standards (for example, ISO) and to exchange best practices, enable selective academic/research access to higher resolution data with stringent security measures.

9. Institutional architecture and capacity building

Appoint a sectoral coordinating authority (which may be a statutory “Environmental Remote Sensing and AI Authority” or organizational unit of the MoEFCC) for the purpose of certification, maintaining the register, dissemination of guidelines, and inter-sectoral coordination with the ISRO/NRSC, the state pollution boards, and the DPDP regulator.

ROADMAP TO IMPLEMENTATION

1. Short-term (0-12 months): Publish directives at the ministerial level that prescribe procedural safeguards such as human validation and logging to agencies using AI-generated remote sensing in enforcement procedures, and the use of Digital Protection Interfaces (DPIs) for pilot schemes.
2. Medium term (12-36 months): Establish technical standards pertaining to accuracy and validation procedures; voluntary registration and modeling certification; pilot audits in a sample of states on wetlands, forest cover, and mining.
3. Long term (36+ months): Promulgate a statutory instrument that will consolidate the specific legal framework and sectoral authority which will interface with the Data Protection and Digital Privacy Act (DPDP) of 2023. Allocate funds specifically earmarked for capacity development programs within state pollution control boards.

CONCLUSION

The remote sensing technique, reinforced by artificial intelligence, has a great potential for change and an ability to improve environmental protection in the Indian context. The AI-

assisted remote sensing technique allows for large-scale, continuous, and virtually real-time tracking of the environmental factors of deforestation, wetlands destruction, illicit mining, pollutant emissions, and violation of environmental clearance conditions.

However, using AI-assisted remote sensing in administrative proceedings carries considerable risks in terms of legality. Without an overarching and specific body of law, big spatial data processing might violate the principles of privacy and due process, especially in cases where high-resolution spatial imaging and data fusion analysis allow indirect identification of persons or communities. Furthermore, the opacity of either potentially erroneous or not externally validated AI models in administrative enforcement might result in unjustified accusations of law-violating behaviour due to false positives in AI outputs, thus damaging the legitimacy of environmental regulation in general. Without clearly defined liability norms concerning either spatial data vendors, AI developers, or administrative departments, this situation creates uncertainty regarding whose technological mistakes will be accountable, thus impairing the feasibility of any available remedies on the matter. If left unresolved, it might create community skepticism about the legitimacy of technology-assisted regulation in the environmental field. To effectively address such concerns, a balanced and properly structured legal framework is needed - one that makes way for a responsible and efficient integration of AI-enabled remote sensing in the context of the overall Indian environmental regulation framework. This is necessary to align information governance policies with other existing laws, particularly the Digital Personal Data Protection Act, 2023, and the Geospatial Policy Framework, while applying a risk-focused regulation paradigm. Registration of substantial risk AI-remote sensing systems, technical and legal auditing, obligations towards transparency, and validation procedures are also essential in establishing the viability and due process in regulation. The ideal legal structure should create accountability measures between technology companies and governmental agencies as well as build up the capability infrastructure of the concerned authorities to validate AI generated data for providing governance that is rights-compatible and trustworthy.

Thus, an appropriate Indian regulation regime for AI-powered remote sensing should be designed on the tenets of proportionality, explainability, accountability, and environmental justice. The Indian framework would require the creation of evidence standards for the outcomes produced by AI algorithms, the setting up of independent audit systems, due process

protections against arbitrary use of power, and coordination between relevant environmental, geospatial, and data protection regulators.