



Ethical Issues in Artificial Intelligence

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ABSTRACT

The proliferation of Artificial Intelligence (AI) has emerged as one of the most transformative shifts in human history, fundamentally altering the fabric of socio-economic interactions, governance, and individual cognition. This research report provides an exhaustive evaluation of the ethical issues inherent in the AI lifecycle, anchored in the UNESCO Recommendation on the Ethics of Artificial Intelligence (2021) and the subsequent "Artificial Intelligence Readiness Assessment Report" for India. The analysis investigates the core normative pillars of human rights, environmental sustainability, and algorithmic fairness, contrasting global standards with India's strategic "AI for All" framework. By synthesizing data from the IndiaAI Mission, the Digital Personal Data Protection Act (2023), and a study of 3,000 global companies, this report exposes a significant "accountability gap" in corporate AI governance where only 13% of firms adhere to formal ethical frameworks. The report details the scientific, educational, and

technical readiness of the Indian ecosystem, highlighting the critical role of linguistic inclusion via the Bhashini platform and the necessity of bridging the 25.6% gender gap in digital access. It concludes with an actionable roadmap for operationalizing ethics by design, strengthening center-state coordination, and establishing robust institutional safeguards to ensure that AI serves as a tool for inclusive societal flourishing rather than a mechanism for power concentration or systemic bias.

KEYWORDS: AI Ethics, UNESCO Recommendation, India AI Mission, Algorithmic Bias, Digital Sovereignty, Human-Centric AI, India Readiness Assessment



1. INTRODUCTION

Artificial intelligence has transitioned from a specialized field of computer science to a pervasive general-purpose technology that redefines human thinking, interaction, and decision-making. As the world navigates this transition, the urgency of establishing an ethical compass has never been more acute. The complexity of AI systems, characterized by their capacity to process vast datasets in ways that resemble intelligent behavior—including reasoning, learning, and prediction—introduces risks that are often opaque to the end-user.¹ These risks encompass the reproduction of real-world biases, the erosion of privacy, and the potential for mass surveillance and social scoring, which threaten the foundational principles of democracy and human dignity.¹

Recognizing these challenges, UNESCO spearheaded the development of the world's first global standard on AI ethics, adopted by 193 Member States in 2021.¹ This recommendation signals a departure from the "self-regulatory model" that has dominated the tech industry for decades, emphasizing instead a rights-based approach that prioritizes people and the public good over commercial or geopolitical imperatives.¹ The UNESCO framework is designed to be future-proof, employing a dynamic understanding of AI that adapts to technological shifts while remaining anchored in universal values.¹

For India, the ethical deployment of AI is a strategic necessity. With a population characterized by immense linguistic and socio-economic diversity, the "solve for India, solve for 40% of the world" philosophy positions the nation as a crucial testing ground for inclusive AI.¹ The Government of India has launched the India AI Mission to democratize access to critical AI resources, including compute capacity and high-quality datasets, while simultaneously building safeguards through the "Safe and Trusted AI"

pillar.¹ This report meticulously explores the intersection of these global ethical standards and India's national readiness, providing a comprehensive assessment of the legal, social, scientific, and technical dimensions required to navigate the AI era responsibly.

2. THE GLOBAL NORMATIVE FRAMEWORK: UNESCO'S VISION

The UNESCO Recommendation on the Ethics of Artificial Intelligence serves as the primary international standard-setting instrument. It approaches AI ethics not as a static set of rules, but as a systematic normative reflection based on a holistic framework of interdependent values and principles.¹

2.1 Foundational Values

UNESCO identifies four core values that serve as the motivating ideals for shaping policy measures and legal norms across the AI lifecycle.¹

1. **Respect, Protection, and Promotion of Human Rights and Human Dignity:** The inviolable dignity of every human being is the foundation of the framework. AI systems should enhance the quality of life without subordinating human communities or objectifying individuals. This is particularly vital in interactions with vulnerable populations, such as children, the elderly, and persons with disabilities.¹



2. Environment and Ecosystem

Flourishing: AI technologies must be evaluated against their existential necessity to the environment. The framework calls for actors to reduce the carbon footprint and energy consumption of AI systems, preventing unsustainable exploitation of natural resources contributing to environmental degradation.¹

3. Ensuring Diversity and Inclusiveness:

This value demands active participation from all individuals regardless of race, gender, language, or disability. It explicitly addresses the digital divide within and between countries, ensuring that low- and

middle-income countries (LMICs) are not merely consumers of foreign technology but active innovators.¹

4. Living in Peaceful, Just, and Interconnected Societies:

AI actors are encouraged to foster solidarity and search for peaceful relations, ensuring that AI processes do not segregate or turn groups against each other.¹

2.2 Principles for the AI Lifecycle

To operationalize these values, UNESCO outlines ten principles that provide concrete guidance for developers, governments, and users.¹

Principle	Description and Implementation
Proportionality and Do No Harm	AI use must be appropriate and proportional to achieve a legitimate aim. Life-and-death decisions must never be ceded to AI. ¹
Safety and Security	Both unwanted harms (safety risks) and vulnerabilities to attack (security risks) must be addressed through the lifecycle. ¹
Fairness and non-discrimination	AI actors must proactively mitigate biases that exacerbate social inequalities, particularly in recruitment and healthcare. ¹
Sustainability	Continuous assessment of the social, cultural, and environmental impact of AI is required to meet SDGs. ¹
Privacy and Data Protection	Data must be collected, shared, and deleted in ways consistent with international law and informed consent. ¹
Human Oversight	Ethical and legal responsibility must always be attributable to physical persons or legal entities. ¹
Transparency and Explainability	Users must be informed when interacting with AI, and the logic of algorithmic building blocks must be intelligible. ¹



Responsibility and Accountability	AI actors must assume liability for decisions informed by AI, supported by auditability and traceability. ¹
Awareness and Literacy	Public understanding of AI risks and data value is essential for meaningful civic participation. ¹
Multi-stakeholder Governance	Governance must be inclusive, adaptive, and respectful of national sovereignty and international law. ¹

3. DIAGNOSING THE NATIONAL AI LANDSCAPE IN INDIA

India's AI trajectory is defined by a strategic vision that integrates technological ambition with social empowerment. The nation has adopted a "quasi-federal" governance structure, where the Union List, State List, and Concurrent List divide legislative powers, ensuring that AI policies are both nationally coherent and locally adaptable.¹

3.1 AI Governance Structure and Evolution

The Ministry of Electronics and Information Technology (MeitY) is the nodal ministry for AI, supported by NITI Aayog and the Office of the Principal Scientific Adviser (PSA).¹ India's governance journey has evolved through several key milestones:

- **2017-2018:** The Commerce Ministry established a task force that acknowledged the importance of

*ethical AI and recommended a central AI agency.*¹

- **2018:** NITI Aayog released the National Strategy for Artificial Intelligence (#AIforAll), identifying five priority sectors: healthcare, agriculture, education, smart cities, and infrastructure.¹
- **2021-2022:** NITI Aayog published documents on "Responsible AI," proposing a risk-based classification system and the establishment of a council for ethics and technology.¹
- **2024:** The Union Cabinet approved the India AI Mission with an outlay of INR 10,371.92 crore to build a comprehensive ecosystem.¹
- **2025:** The India AI Governance Guidelines were released, articulating seven foundational principles for safe and trusted AI innovation.¹



3.2 The Seven Pillars of the India AI Mission

The Mission is structured to address the critical gaps in the Indian ecosystem through targeted interventions.

Pillar	Objective	Current Status (2025)
Compute Capacity	Scalable infrastructure for startups.	38,231 GPUs made available. ¹
Foundational Models	Indigenous LLMs for Indian needs.	12 startups shortlisted for development. ¹
AI Kosh (Datasets)	Democratizing access to quality data.	1,400+ datasets and 200+ models available. ¹
Application Dev (AIADI)	AI for socio-economic transformation.	30 solutions shortlisted for funding. ¹
Future Skills	Academic and workforce skilling.	10,000 students to be trained in 27 labs. ¹
Startup Financing	Funding across lifecycle stages.	Global programs launched with Station F. ¹
Safe and Trusted AI	Ethics and safety integration.	India AI Safety Institute launched. ¹

4. LEGAL AND REGULATORY DIMENSIONS: ADDRESSING THE GOVERNANCE GAP

India currently avoids "hard" overarching regulation in favor of a principles-based agile framework.¹ This strategy allows for innovation while utilizing existing laws to mitigate risks.¹



4.1 The Digital Personal Data Protection Act (DPDPA), 2023

The DPDPA is a landmark legislation that grants "Data Principals" control over their digital personal data while balancing public interest.¹ It mandates free and informed consent, particularly critical for AI training sets that often rely on scraped data.⁴

- **Rights of Individuals:** Access, correction, and erasure of personal data.¹
- **Data Fiduciaries:** Obligations to ensure transparency and accountability, with "Significant Data Fiduciaries" required to conduct impact assessments.¹
- **Consent Managers:** Independent entities to help individuals manage their permissions.¹
- **Enforcement:** The Data Protection Board of India (DPBI) can impose penalties up to INR 250 crore.¹

4.2 Sectoral Regulation and Gap Analysis

Regulatory bodies in finance (RBI), medicine (ICMR), and telecom (TRAI) are drafting sector-specific guidelines to ensure accountability where AI systems are deployed in high-stakes environments.¹ For example, the ICMR's "Ethical Guidelines for Application of AI in Biomedical Research and Healthcare" emphasize human oversight and validity.¹

A legal gap analysis conducted by the PSA Committee identified that while deepfakes are partially covered under the IT Act and IPC, specific compliance guidance for AI-generated threats remains under development.¹ Intellectual property remains a grey area, with the authorship of AI-

generated works and the legality of training on copyrighted data still requiring expert consultation.¹

4.3 Online Safety and Intermediaries

The IT Rules 2021 empower the government to issue blocking orders and require platforms to establish grievance redressal mechanisms.¹ Proposed amendments in 2025 regarding "Synthetically Generated Information" (SGI) will mandate prominent labeling and permanent metadata identifiers for deepfakes, ensuring that users can distinguish between authentic and artificial content.¹

5. SOCIAL AND CULTURAL DIMENSIONS: "AI FOR ALL"

The cultural context of India plays a vital role in AI adoption. The UNESCO Recommendation highlights that AI systems must reflect linguistic and demographic diversity to avoid "cultural dilution".¹

5.1 Linguistic Inclusion and Bhashini

To address the language barrier, the IT Ministry launched Bhashini, a voice-first multilingual platform supporting 22 Indian languages.¹ The BhashaDaan initiative crowdsources language data to improve NLP models, enabling farmers and rural citizens to access government services in their mother tongue.¹ Project Vaani, a joint initiative by IISc and ART PARK, aims to collect 150,000 hours of speech data across 773 districts to ensure AI models are regionally representative.¹



5.2 The Digital Gender Divide

India faces significant disparities in technology access along gender lines. As of

2025, the gender gap in internet use stands at 0.74, meaning for every 100 men online, only 74 women have access.¹

Digital Access Metric	Status in India
Internet Penetration (Urban)	563.19 million ¹
Internet Penetration (Rural)	406.97 million ¹
Gender Gap in Internet Use	25.6% ¹
Mobile Phone Ownership (Rural Women)	48.4% (vs 80.7% for men) ¹

Government programs like "Vigyan Jyoti" and "CURIE-AI" target meritorious girls and women's universities to build a robust talent pipeline in STEM fields.¹ The "AI Careers for Women" initiative aims to train 20,000 learners in Tier 2 and Tier 3 towns, bridging the gap between education and high-tech employment.¹

5.3 Public Engagement and Trust

Public confidence in AI in India is remarkably high compared to global trends. According to the IPSOS AI Monitor 2024, 60% of urban Indians trust companies to handle their personal data via AI, and 62% believe AI's benefits outweigh its risks.¹ This confidence is largely attributed to the success of foundational digital public infrastructure like Aadhaar and UPI, which have fostered a culture of digital adoption.¹ However, stakeholders caution that this trust could be

undermined by "black box" algorithms if transparency mechanisms are not clearly institutionalized.¹

6. SCIENTIFIC AND EDUCATIONAL DIMENSIONS: KNOWLEDGE PRODUCTION

UNESCO's framework emphasizes that AI education must include ethical reflection and critical thinking.¹ India has institutionalized these priorities through the National Education Policy (NEP) 2020.¹



6.1 Academic Integration and Skilling

The NEP recommends integrating AI into all levels of education.¹ The Central Board of Secondary Education (CBSE) has introduced AI as a subject for Grades 8 to 10, training over 100,000 students in neural networks and AI ethics.¹ At the higher education level, enrollment in STEM fields remains strong, but only 18.6% of researchers are women, indicating a need for targeted interventions in the research ecosystem.¹

6.2 Research and Innovation Capacity

India ranks 5th globally in AI patent filings, yet its share of granted patents is a mere 0.37%.¹ To enhance innovation, the government increased funding for the Department of Science & Technology (DST) from INR 2,300 crore in 2024/25 to INR 20,000 crore in 2025/26.¹ The "National Mission on Interdisciplinary Cyber-Physical Systems" has established 25 technology innovation hubs, focusing on ML, data analytics, and speech processing.¹

7. ECONOMIC AND LABOR DIMENSIONS: THE FUTURE OF WORK

Widespread AI adoption is estimated to boost India's GDP by USD 1.9 trillion by 2035, helping the economy reach an \$8.3 trillion target.¹ However, this growth brings significant labor market transitions.

7.1 Job Displacement and Cognitive Automation

Unlike previous technological shifts that primarily affected manual labor, AI is

automating cognitive and mid-career roles in IT/ITES and financial services.¹ This creates a "responsibility vacuum" and job security concerns for mid-career workers.¹ Stakeholders have highlighted the loss of "on-the-job learning pathways" as entry-level tasks are automated.¹

7.2 India's AI Skill Penetration

India ranks second globally in AI skill penetration with a score of 2.51, second only to the USA (2.63).¹ The India AI Future Skills pillar seeks to capitalize on this by providing 500 Ph.D. fellowships and establishing 570 data labs across the country.¹ Private sector investments in upskilling have also risen, with companies dedicating up to 1.5% of revenue to workforce training.¹

8. TECHNICAL AND INFRASTRUCTURAL READINESS

Technical infrastructure is the bedrock of ethical AI. Without sufficient compute and high-quality data, attempts to mitigate bias or ensure explainability remain theoretical.¹

8.1 Compute Capacity and Sovereignty

Under the India AI Mission, the government is building high-end scalable compute infrastructure.¹ As of May 2025, 38,231 GPUs are available through public-private empanelment.¹ The AIRAWAT supercomputer has placed India in the top supercomputing league globally, supporting research and startup innovation.¹



8.2 Data Governance and AI Kosh

AI Kosh is designed to democratize access to anonymized, high-quality Indian datasets.¹ By creating "Data Curation Units" (DCUs) across 50 ministries, the government aims to reduce siloed data practices and make public datasets "AI-ready".¹ This is critical for training inclusive models that reflect the nuances of Indian agriculture, health, and mobility.⁹

8.3 Cybersecurity Preparedness

India achieved Tier-1 status on the ITU's Global Cybersecurity Index 2024, with a score of 98.49 out of 100.¹ This indicates a high level of preparedness in legal and technical measures, though "organizational measures" remains an area for potential growth.¹

Cybersecurity Pillar	India Score (out of 20)
Legal Measures	20
Technical Measures	20
Organizational Measures	18.49
Capacity Development	20
Cooperation Measures	20



9. ENVIRONMENTAL AND SUSTAINABILITY POLICIES

A critical ethical concern is AI's environmental footprint. India's 2070 net-zero commitment provides a broad framework, but AI-specific requirements are still emerging.¹ Data centers require substantial water for cooling and energy for computation, leading to a "digital thirst" in water-scarce regions.¹

Current policies like the Draft Data Centre Policy 2020 encourage renewable energy but lack specific safeguards for land use or e-waste.¹ The "India AI Governance Guidelines" state that AI development should be "environmentally responsible and resource-efficient," yet there is currently no legal mandate for a specialized Environmental Impact Assessment (EIA) for AI infrastructure.¹

10. THE CORPORATE ACCOUNTABILITY GAP: GLOBAL INSIGHTS

A 2026 UNESCO study of 3,000 global companies reveals a stark disconnect between ethical principles and operational reality.³

- **Strategy vs. Adherence:** While 44% of companies report having an AI strategy, only 13% publicly claim adherence to a formal governance

framework.⁷

- **Human Rights Neglect:** Only 7% of firms conduct human rights impact assessments specifically for their AI systems.³
- **Environmental Oversight:** Only 11% evaluate the environmental impact of their AI leverage.³
- **Oversight Deficit:** Only 12% of companies have a policy ensuring human oversight of automated decision-making.³

This "accountability gap" emphasizes the importance of India's move toward the India AI Safety Institute (AISI), which aims to act as a national anchor for driving research on risk mitigation and supporting industry compliance.¹

11. STRATEGIC ROADMAP FOR ETHICAL AI GOVERNANCE

Based on the findings from the Readiness Assessment Methodology (RAM) and the UNESCO Recommendation, this report proposes a structured roadmap for India to strengthen its AI ecosystem.¹

11.1 Recommendation 1: Informed Governance and Risk Mapping

India must transition from declaratory principles to evidence-based regulation.¹

- **Roadmap 1.1:** The India AI Safety Institute should conduct a national AI risk-mapping exercise, developing a multidimensional taxonomy of harms encompassing technical, legal,



societal, and national security dimensions.¹

- **Roadmap 1.2:** *A comprehensive legal review should evaluate the IT Act 2000 and DPDPA 2023 for efficacy in addressing AI-specific risks like bias and copyright infringement.¹*

11.2 Recommendation 2: Operationalizing Ethics for Developers

Translating principles like "fairness" into code is a major barrier for startups.¹

- **Roadmap 2.1:** *Establish a voluntary repository of ethical AI practices, including model documentation standards and bias mitigation strategies.¹*
- **Roadmap 2.3:** *Implement "Regulatory Sandboxes" in sectors like healthcare and finance where developers can test "ethics by design" in controlled environments under regulatory supervision.¹*

11.3 Recommendation 3: Strengthening Center-State Coordination

AI policy planning must be harmonized across the federal structure.¹

- **Roadmap 3.2:** *The India AI Mission should publish modular toolkits for states to establish dedicated AI cells, including adaptable procurement norms and sample governance structures.¹*

11.4 Recommendation 5: Advancing Public Trust through Procurement

The government, as a major adopter of AI, must lead by example.¹

- **Roadmap 5.1:** *Update public procurement policies to include mandatory ethical AI and safety criteria for government-funded projects.¹*
- **Roadmap 5.2:** *Launch national awareness campaigns to educate citizens on their rights, benefits, and risks regarding AI-driven public services.¹*

11.5 Recommendation 6: Preparing the Workforce for inclusive Transitions

The Ministry of Labor and Skill Development must anticipate displacement.¹

- **Roadmap 6.4:** *Develop an AI workforce transition platform to support reskilling and job mobility for at-risk workers, particularly in the informal sector and mid-career IT roles.¹*



12. CONCLUSION

The ethical governance of Artificial Intelligence is not an impediment to innovation but a prerequisite for its sustained success and societal acceptance. This report has demonstrated that while global normative frameworks, such as the UNESCO Recommendation, provide the necessary universal values, their practical implementation requires deep national context. India's AI readiness assessment reveals a nation uniquely positioned to bridge the digital divide, provided it addresses critical tensions in its ecosystem.

The "accountability gap" observed in global corporate practices serves as a cautionary tale for India's dynamic startup landscape. Proactive measures, such as the operationalization of the India AI Safety Institute and the institutionalization of the AI Kosh platform, are vital steps toward building a safe and trusted AI ecosystem. Furthermore, the commitment to linguistic inclusion through Bhashini and the empowerment of women in STEM are essential for ensuring that AI-driven growth delivers broad-based welfare.

Ultimately, the goal of AI governance in India—and the world—must be the fulfillment of human potential. By following the roadmap presented in this research, characterized by center-state coordination, ethical procurement, and workforce transitions, India can lead the Global South in demonstrating how advanced technology can be harmonized with human dignity, social justice, and environmental sustainability. The AI era must be defined not by the concentration of power in a handful of firms or nations, but by an interconnected future where technology flourishes for the benefit of all.

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