Strengthening Environmental Compliance Mechanisms: Sector-Wise Obligations For Infrastructure, Energy & Manufacturing

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Abstract

India's environmental compliance regime has developed into a comprehensive legal framework grounded in constitutional interpretation, statutory regulation, delegated legislation, and specialised adjudication. Judicial expansion of Article 21 has constitutionalised environmental protection, while doctrines such as absolute liability, precautionary principle, and polluter pays have strengthened accountability. Statutes including the Environment (Protection) Act, 1986, the Water and Air Acts, the Forest (Conservation) Act, and the National Green Tribunal Act collectively establish a preventive, consent-based, and enforcement-oriented regulatory structure. The Environmental Impact Assessment Notification, 2006 functions as the primary gateway for prior environmental scrutiny across infrastructure, energy, and manufacturing sectors. Sector-specific obligations encompass pollution control consents, forest diversion approvals, hazardous waste management, and extended producer responsibility. Although the framework is normatively robust, enforcement challenges persist due to institutional capacity constraints and procedural complexities. Strengthening environmental compliance requires technological monitoring, calibrated penalties, and integrated regulatory reform to ensure that developmental objectives remain aligned with ecological sustainability.

I. Constitutional Foundations of Environmental Compliance

Environmental compliance in India derives its normative force from constitutional interpretation. Although the Constitution does not expressly enumerate a standalone right to environment, Article 21[1] guaranteeing the right to life and personal liberty has been expansively construed by the Supreme Court to encompass the right to live in a pollution-free and ecologically balanced environment. This interpretative development has elevated environmental protection from a matter of statutory policy to a constitutional imperative.

In *M.C. Mehta v. Union of India*[2], the Supreme Court articulated the doctrine of absolute liability in the context of hazardous industries. Departing from the traditional rule in *Rylands v. Fletcher*[3], the Court held that enterprises engaged in inherently dangerous or hazardous activities are strictly and absolutely liable for any harm resulting from such activities, irrespective of fault or negligence. This principle significantly strengthened compliance obligations by placing the burden of environmental risk squarely upon industrial operators.

Subsequently, in *Vellore Citizens Welfare Forum v. Union of India*[4], the Court formally recognised the precautionary principle and the polluter pays

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[1] *India Const. art. 21.*

[2] *M.C. Mehta v. Union of India, (1987) 1 SCC. 395 (India)*

[3] *Rylands v. Fletcher, (1868) LR 3 HL 330 (UK)*

[4] *Vellore Citizens Welfare Forum v. Union of India, 1996 (5) SCC 647*

principle as integral components of Indian environmental law. The precautionary principle mandates anticipatory action in cases of environmental uncertainty, while the polluter pays principle requires that the cost of environmental degradation be borne by the responsible party.

Through these doctrinal developments, environmental compliance has assumed a constitutional character. Regulatory obligations are no longer confined to statutory prescriptions; they are anchored in constitutional accountability and the broader commitment to sustainable development.

II. Core Statutory Architecture Governing Environmental Compliance

1. Environment (Protection) Act, 1986[5] (EPA)

The Environment (Protection) Act, 1986 is an umbrella legislation enacted under Article 253[6] of the Constitution to implement the Stockholm Declaration (1972). Section 3 empowers the Central Government to take measures to protect and improve environmental quality. Section 5 authorises issuance of binding directions, including closure of industries.

The Act forms the basis for delegated legislations including:

- Environmental Impact Assessment (EIA) Notification, 2006[7]
- Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016[8]
- Solid Waste Management Rules, 2016[9]
- Plastic Waste Management Rules, 2016[10]
- Construction and Demolition Waste Management Rules, 2016[11]

Non-compliance attracts penal liability under Section 15 (imprisonment up to five years and/or fine).

2. Water (Prevention and Control of Pollution) Act, 1974[12]

The Water (Prevention and Control of Pollution) Act, 1974 establishes Central and State Pollution Control Boards (CPCB and SPCBs). Section 25 mandates prior Consent to Establish (CTE) and Consent to Operate (CTO) for industries discharging effluents.

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[5] Environment (Protection) Act, 1986, No. 29 of 1986, INDIA CODE (1986)

[6] INDIA CONST. art. 253

[7] Environmental Impact Assessment Notification, 2006, S.O. 1533(E), Gazette of India, Extraordinary, pt. II, 3(ii) (Sept. 14, 2006) (India)

[8] Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, G.S.R. 395(E), Gazette of India, Extraordinary, pt. II, 3(i) (Apr. 4, 2016) (India)

[9] Solid Waste Management Rules, 2016, G.S.R. 451(E), Gazette of India, Extraordinary, pt. II, 3(i) (Apr. 8, 2016) (India).

[10] Plastic Waste Management Rules, 2016, G.S.R. 320(E), Gazette of India, Extraordinary, pt. II, 3(i) (Mar. 18, 2016) (India).

[11] Construction and Demolition Waste Management Rules, 2016, G.S.R. 317(E), Gazette of India, Extraordinary, pt. II, 3(i) (Mar. 29, 2016) (India).

[12] Water (Prevention and Control of Pollution) Act, 1974, No. 6 of 1974, INDIA CODE (1974)

Section 33A empowers Boards to issue directions, including closure or regulation of industry.

3. Air (Prevention and Control of Pollution) Act, 1981[13]

Under the Air (Prevention and Control of Pollution) Act, 1981, industries located in declared air pollution control areas must obtain prior consent (Section 21). The Act regulates emission standards and enables enforcement through monitoring and inspection.

4. Forest (Conservation) Act, 1980[14]

The Forest (Conservation) Act, 1980 mandates prior Central Government approval for diversion of forest land for non-forest purposes (Section 2). Infrastructure and energy projects frequently trigger forest clearance requirements.

5. National Green Tribunal Act, 2010[15]

The National Green Tribunal Act, 2010 establishes the National Green Tribunal (NGT) for expeditious environmental adjudication. Section 15 empowers the Tribunal to award compensation and restitution.

III. Environmental Impact Assessment: The Preventive Compliance Mechanism

The Environmental Impact Assessment (EIA) Notification, 2006, issued under Section 3 of the Environment (Protection) Act, 1986, institutionalises a preventive approach to environmental governance by mandating prior Environmental Clearance (EC) for specified categories of developmental projects. The regulatory design reflects the precautionary principle by requiring environmental appraisal before commencement of construction or operation.

Projects are classified into Category A and Category B depending upon their scale, capacity, and potential environmental impact. Category A projects require appraisal and clearance by the Central Government through the Expert Appraisal Committee (EAC), whereas Category B projects are considered at the State level by the State Environment Impact Assessment Authority (SEIAA).

The clearance process ordinarily proceeds through the following stages:

1. Screening and scoping, to determine the extent and depth of environmental assessment required;
2. Public consultation, ensuring stakeholder participation and transparency;
3. Appraisal by the Expert Appraisal Committee, based on environmental impact reports and public representations;

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[13] *Air (Prevention and Control of Pollution) Act, 1981, No. 14 of 1981, INDIA CODE (1981)*

[14] *Forest (Conservation) Act, 1980, No. 69 of 1980, INDIA CODE (1980).*

[15] *National Green Tribunal Act, 2010, No. 19 of 2010, INDIA CODE (2010).*

4. Grant or rejection of Environmental Clearance, subject to conditions aimed at mitigating environmental harm.

Judicial interpretation has reinforced the mandatory character of prior environmental clearance. In *Alembic Pharmaceuticals Ltd. v. Rohit Prajapati*[16], the Supreme Court disapproved the practice of granting post-facto environmental clearances, holding that environmental safeguards cannot be diluted into mechanisms of retrospective regularisation. The Court emphasised that compliance must precede, and not follow, environmental impact.

The EIA framework therefore operates as the principal compliance gateway across infrastructure, energy, and manufacturing sectors. By embedding environmental appraisal within project planning, it seeks to reconcile developmental objectives with ecological sustainability at the threshold stage itself.

IV. Sector-Wise Environmental Compliance Obligations

A. Infrastructure Sector

Infrastructure development covering highways, ports, rail corridors, dams, airports, and urban real estate has profound ecological implications. Compliance obligations in this sector are multi-dimensional.

First, most large-scale infrastructure projects require prior Environmental Clearance under the EIA Notification, 2006. Linear projects such as highways often involve forest diversion, triggering Section 2 of the Forest (Conservation) Act[17]. Additionally, projects located near protected areas require wildlife clearance under the Wildlife (Protection) Act, 1972[18].

For real estate and construction projects exceeding prescribed thresholds, environmental compliance includes:

- Installation of Sewage Treatment Plants (STPs)
- Rainwater harvesting systems
- Solid waste segregation and disposal
- Energy-efficient building standards
- Development of green belts

Failure to obtain prior EC has led to imposition of environmental compensation by the NGT, as seen in *Goel Ganga Developers India Pvt. Ltd. v. Union of India*[19], where the Supreme Court upheld penalties for construction without clearance.

In infrastructure projects involving forest land diversion, compliance also includes:

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[16] Alembic Pharmaceuticals Ltd. v. Rohit Prajapati, (2020) 17 S.C.C. 157 (India)

[17] Forest (Conservation) Act, 1980, No. 69 of 1980, INDIA CODE (1980)

[18] Wildlife (Protection) Act, 1972, No. 53 of 1972, INDIA CODE (1972)

[19] Goel Ganga Developers India Pvt. Ltd. v. Union of India, (2018) 18 SCC 257

- Payment of Net Present Value (NPV)
- Compensatory afforestation
- Wildlife mitigation plans

Thus, infrastructure compliance is characterised by layered approvals, ecological compensation, and continuous monitoring obligations.

B. Energy Sector

The energy sector represents the most compliance-intensive domain due to emissions, land use, and ecological impact.

1. Thermal Power Plants

Coal-based thermal plants must comply with emission standards prescribed under the EPA and subsequent notifications. Obligations include:

- Installation of Flue Gas Desulfurisation (FGD) systems
- Fly ash utilisation in accordance with the Fly Ash Notification, 2016
- Continuous Emission Monitoring Systems (CEMS)
- Adherence to water consumption limits

Non-compliance may attract closure directions under Section 5 of the EPA and penalties under Section 15.

2. Renewable Energy

While solar and wind energy projects are environmentally preferable, they are not compliance-free. Land conversion approvals, forest clearance (if applicable), and environmental management plans remain mandatory. Biodiversity concerns particularly bird mortality in wind farms have prompted regulatory scrutiny.

3. Hydropower Projects

Hydropower projects require comprehensive EIA, forest diversion clearance, and downstream ecological assessment. In *Alaknanda Hydro Power Co. Ltd. v. Anuj Joshi*[20], the Supreme Court emphasised cumulative impact assessment of river basin projects, recognising that piecemeal clearances undermine ecological sustainability.

Energy sector compliance thus reflects the tension between developmental imperatives and ecological safeguards.

C. Manufacturing Sector

The manufacturing sector remains central to India's economic growth yet poses significant environmental risks through effluent discharge, air emissions, and hazardous waste generation.

Industries must obtain Consent to Establish and Consent to Operate under the Water and Air Acts. Compliance is ongoing and conditional upon adherence to emission and effluent standards.

[20] *Alaknanda Hydro Power Co. Ltd. v. Anuj Joshi (2013) 2 SCC 383*

Hazardous Waste Compliance

Under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, industries must:

- Obtain authorisation from SPCBs
- Maintain manifest tracking systems
- Dispose waste only through authorised facilities

Illegal dumping constitutes an offence under Section 15 of the EPA.

Extended Producer Responsibility (EPR)

Manufacturers of plastics and electronic goods are subject to Extended Producer Responsibility under the Plastic Waste Management Rules, 2016 and E-Waste Management Rules, 2022. Producers must meet recycling targets and submit compliance reports, failing which environmental compensation may be levied.

Manufacturing compliance, therefore, is not episodic but continuous, monitored through inspection, reporting, and digital submission systems.

V. Enforcement and Adjudication

Environmental compliance in India is enforced through a dual institutional structure comprising administrative regulators and specialised judicial forums. While statutory obligations are imposed under various enactments, their efficacy depends significantly upon regulatory oversight and adjudicatory intervention.

At the administrative level, Pollution Control Boards constituted under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 serve as the primary enforcement authorities. These Boards are vested with inspection, monitoring, and regulatory powers. Section 33A of the Water Act authorises State Pollution Control Boards to issue binding directions, including closure, prohibition, or regulation of any industry, and to order disconnection of electricity or water supply in cases of non-compliance. A corresponding power is conferred under Section 31A of the Air Act. These provisions transform regulatory standards into enforceable mandates.

In recent years, Pollution Control Boards have increasingly invoked the "polluter pays" principle to impose Environmental Compensation for violations. Rather than relying solely on criminal prosecution, Boards now adopt compensatory models calibrated to the scale and duration of environmental harm. This shift reflects a movement toward restorative environmental governance, wherein the objective is not merely punishment but ecological remediation.

Judicially, the National Green Tribunal (NGT), established under the National Green Tribunal Act, 2010, has emerged as the principal forum for environmental enforcement. Exercising jurisdiction under Sections 14 and 15 of the Act, the Tribunal adjudicates substantial environmental questions and awards relief, compensation, and restitution. The NGT has consistently emphasised restoration of environmental damage over symbolic penal sanctions.

VI. Structural Challenges and Reform Imperatives

Despite a comprehensive statutory framework, enforcement challenges remain. Overlapping approval processes, limited institutional capacity within State Pollution Control Boards, and delays in adjudication often weaken regulatory effectiveness. The tendency toward post-facto regularisation further dilutes the preventive character of environmental law, notwithstanding judicial disapproval in Alembic Pharmaceuticals Ltd. v. Rohit Prajapati, Additionally, uniform compliance standards may impose disproportionate burdens on MSMEs, while criminal prosecution under environmental statutes remains infrequent and prolonged.

To strengthen environmental compliance mechanisms, reforms should focus on:

- Streamlining sector-specific compliance frameworks;
- Expanding digitised monitoring and real-time emission tracking;
- Institutionalising independent environmental audits;
- Adopting graded penalties proportionate to turnover and environmental harm;
- Integrating climate mitigation considerations within environmental clearance processes.

Such reforms would enhance both regulatory certainty and environmental outcomes.

VII. Conclusion

India's environmental compliance regime embodies a structured interaction between constitutional mandates, statutory regulation, and judicial oversight. Infrastructure, energy, and manufacturing sectors operate under stringent yet differentiated compliance obligations involving environmental clearance, pollution control consents, forest diversion approvals, and waste management regulation.

While the legal framework is substantively robust, its effectiveness depends upon consistent enforcement and institutional strengthening. Environmental compliance must evolve from procedural adherence to a culture of regulatory responsibility embedded within industrial governance. Only then can environmental law fulfil its role as a constitutional instrument balancing development with ecological sustainability.