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Corporate Accountability for Industrial Waste Dumping: A Comparative Analysis between India and South Africa

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Abstract—**Industrial waste dumping raises concerns about corporate accountability and the effectiveness of environmental enforcement in India. This study examines gaps between statutory obligations and their implementation through a comparative study of India and South Africa. The case studies of Bichhri, Shongweni and Thor Chemicals illustrate difficulties in investigating corporate conduct, enforcing liability and securing environmental restoration. The analysis considers India's amended penalty provisions and the Environment Protection (Management of Contaminated Sites) Rules, 2025. It identifies weaknesses in investigative capacity, waste tracking, enforcement coordination and the recovery of remediation costs. South Africa offers relevant institutional lessons through its specialized environmental inspectorate and structured enforcement reporting, although its experience also reveals persistent implementation failures. The study proposes reforms adapted to India's institutional and resource constraints, including specialized investigation teams within existing authorities, verifiable waste records, transparent enforcement outcomes and monitored remediation. It argues that effective corporate accountability requires existing legal duties to translate into timely enforcement and demonstrable environmental recovery.**

Index Terms—**Corporate Accountability, Environmental Crime, Environmental Restoration, Hazardous Waste, Industrial Waste Dumping**

I. INTRODUCTION

Industrial waste dumping exposes a central weakness in environmental governance. The legal responsibility to manage hazardous residues may be clear, yet the institutions responsible for detecting violations and securing restoration may struggle to enforce it. A company can reduce its immediate expenditure by avoiding treatment, misdescribing waste or transferring it to an unsuitable operator. The resulting environmental costs may fall on neighboring communities and public authorities. India's environment ministry identifies contamination of soil and water

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through leaching as a consequence of unscientific hazardous-waste disposal.[1] The legal inquiry must therefore extend beyond whether disposal is prohibited to whether the prohibition changes corporate conduct.

This study examines industrial waste dumping through a comparison of India and South Africa. It argues that India's principal reform needs concern the connection between existing legal duties and enforceable outcomes. South Africa provides useful institutional examples; its experience also demonstrates that specialized institutions can coexist with serious non-compliance.

The analysis follows five connected stages: investigation and evidence collection; progression from inspection to prosecution; responsibility across the waste chain; transparency of enforcement outcomes; and restoration with recovery of costs. These stages provide a way to distinguish a legislative omission from a failure to implement an existing provision. UNEP's assessment of environmental rule of law identifies both specialized enforcement and standardized indicators as important areas of institutional development.[2]

Three case studies ground the discussion. Bichhri illustrates the difficulty of translating judicially recognised liability into timely remedial action. Shongweni demonstrates the interaction of waste licensing, community litigation and enforcement against a corporate disposal operator. Thor Chemicals exposes the prolonged consequences of accumulated hazardous waste. They support a conception of corporate accountability that includes prevention, legally justified sanctions and restoration. A completed prosecution and a completed clean-up remain different achievements, requiring different evidence.

The study uses industrial waste dumping to include unlawful disposal of industrial residues and failures in their handling at treatment or disposal facilities. It concentrates on hazardous waste and associated contamination. It does not treat all industrial emissions, municipal refuse or mining damage as legally interchangeable. In India, rule 2(a) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 excludes wastewater governed by the Water (Prevention and Control of Pollution) Act, 1974. An investigation must identify the material and activity before selecting the applicable provisions.[3]

Corporate environmental crime also requires careful usage. Environmental damage does not automatically establish a criminal offence. Criminal liability depends on the applicable prohibition, attribution rules and evidentiary requirements. Administrative penalties, licensing

[1] Press Information Bureau, Government of India, "New Hazardous Waste Rules Will Ensure Resource Recovery and Disposal of Hazardous Waste in Environmentally Sound Manner" (2016), available at: https://www.pib.gov.in/newsite/PrintRelease.aspx?relid=138521 (last visited on Oct. 16, 2026) (describing contamination through leaching and the objectives of the 2016 Rules).

[2] United Nations Environment Programme, "Environmental Rule of Law: Tracking Progress and Charting Future Directions" (2023), available at: https://www.unep.org/resources/publication/environmental-rule-law-tracking-progress-and-charting-future-directions (last visited on Oct. 16, 2026) (overview and recommendations concerning specialised enforcement and indicators).

[3] The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, r. 2(a), G.S.R. 395(E), Gazette of India, Extraordinary, pt. II, sec. 3(i), Apr. 4, 2016; India Code, available at: https://upload.indiacode.nic.in/showfile?actid=AC_DH_62_997_00001_00001_1551355913434&filename=hazardous_and_other_wastes_%28management_and_transboundary_movement%29_rule%2C_2016.pdf&type=rule (last visited on Oct. 19, 2026).

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directions and compensatory orders may address the same events without amounting to criminal convictions. This distinction is especially important following India's changes to environmental penalties. The study uses corporate environmental wrongdoing as the broader category and identifies criminal liability separately.

South Africa is an appropriate comparator. The World Bank classifies India as lower-middle-income and South Africa as upper-middle-income.[4] Neither country's experience can be reduced to this classification. South Africa's experience offers a developing-economy setting for evaluating specialized enforcement, regulatory coordination and public accountability. The relevant question is whether a mechanism can operate effectively within India's existing institutions and fiscal constraints.

II. LEGAL AND INSTITUTIONAL FRAMEWORKS

2.1 India

India's Environment (Protection) Act, 1986 supplies overarching regulatory authority. Sections 3 and 5 enable protective measures and binding directions, including closure or regulation of industrial activity. Sections 7 and 8 regulate excessive pollutant discharges and hazardous-substance handling. The 2016 Hazardous and Other Wastes Rules add operational duties: rule 4 requires environmentally sound management and authorized destinations, while rule 6 establishes authorization requirements.[5] Consequently, outsourcing disposal does not make the generator's own regulatory obligations disappear.

The Water Act provides a further route where dumping affects water or involves trade effluent. Section 24 prohibits specified polluting discharges; sections 25 and 26 establish the consent framework, subject to applicable exemptions and amendments. Sections 3 and 4 establish the Central and State Pollution Control Boards, and sections 16 and 17 allocate their functions. Section 33A enables binding directions, including closure and interruption of services.[6] These powers make an important distinction possible: preventing continued pollution need not await the conclusion of a criminal trial.

The National Green Tribunal Act, 2010 adds specialized adjudication. Section 14 concerns civil environmental disputes within its statutory scope; section 15 authorizes relief, compensation and

[4] World Bank, "World Bank Country and Lending Groups", available at: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups (last visited on Oct. 16, 2026) (fiscal year 2027 classifications).

[5] The Environment (Protection) Act, 1986 (Act 29 of 1986), ss. 3, 5, 7–8; India Code, available at: https://www.indiacode.nic.in/bitstream/123456789/1876/4/A1986-29.pdf (last visited on Oct. 19, 2026). See also *supra* note 3, rr. 4, 6.

[6] The Water (Prevention and Control of Pollution) Act, 1974 (Act 6 of 1974), ss. 3–4, 16–17, 24–26, 33A; India Code, available at: https://www.indiacode.nic.in/bitstream/123456789/1612/1/AAA1974-06.pdf (last visited on Oct. 19, 2026). The Water (Prevention and Control of Pollution) Amendment Act, 2024 (Act 5 of 2024), ss. 1, 4–5; India Code, available at: https://upload.indiacode.nic.in/showfile?actid=AC_CEN_16_18_00003_197606_1517807320722&filename=water_act_2024_%281%29-2.pdf&type=rule (last visited on Oct. 19, 2026) (territorial application, exemption power and consent guidelines).

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restitution; section 16 provides appellate jurisdiction. Section 20 requires application of sustainable development, precaution and polluter pays. The Tribunal is not a general criminal trial court.[7] Gill's research on its expert members demonstrates that India already possesses a significant institutional response to the scientific complexity of environmental disputes.[8] The comparative inquiry should therefore concentrate on investigation and implementation rather than proposing specialized adjudication as an entirely foreign innovation.

Two recent developments alter the reform baseline. The Jan Vishwas (Amendment of Provisions) Act, 2023 restructured penalties under the Environment Act, with the relevant changes reflected in the consolidated statute from April 2024. The Environment Protection (Management of Contaminated Sites) Rules, 2025 introduced a distinct framework for identifying, assessing and remediating contaminated land.[9] Neither development should be omitted when evaluating India's present system against older judgments.

2.2 South Africa

South Africa's National Environmental Management Act 107 of 1998, commonly called NEMA, provides the institutional framework. Sections 31B and 31C concern the designation of environmental inspectors, while section 31D defines their mandates. The National Environmental Management: Waste Act 59 of 2008 supplies waste-specific controls. Section 20 regulates listed waste-management activities, section 26 prohibits unauthorized disposal, and sections 67 and 68 establish offences and penalties.[10] The relationship between an inspector's designation and statutory mandate matters; the Green Scorpions are not an unrestricted police force.

The South African framework is useful because it connects administrative supervision with specialized investigation. Its relevance does not rest on the existence of a single waste statute alone. India already regulates multiple stages of waste management through delegated legislation

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[7] The National Green Tribunal Act, 2010 (Act 19 of 2010), ss. 14–16, 20; India Code, available at: https://www.indiacode.nic.in/bitstream/123456789/2025/1/AA2010__19green.pdf (last visited on Oct. 19, 2026).

[8] Gitanjali Nain Gill, "Environmental Justice in India: The National Green Tribunal and Expert Members" 5 *Transnational Environmental Law* 175, 175–176 (2016), available at: https://doi.org/10.1017/S2047102515000278 (last visited on Oct. 16, 2026).

[9] The Jan Vishwas (Amendment of Provisions) Act, 2023 (Act 18 of 2023), s. 2 and sch.; India Code, available at: https://upload.indiacode.nic.in/showfile?actid=AC_CEN_16_0_00013_192716_1523350029217&filename=notification%28legislative_department%29_0001.pdf&type=notification (last visited on Oct. 19, 2026). The Environment (Protection) Act, 1986 (Act 29 of 1986), ss. 14A–16B and amendment notes. The Environment Protection (Management of Contaminated Sites) Rules, 2025, S.O. 3401(E), Gazette of India, Extraordinary, pt. II, sec. 3(ii), July 24, 2025; India Code, available at: https://upload.indiacode.nic.in/showfile?actid=AC_CEN_16_18_00011_198629_1517807327582&filename=s.o.3401%28e%29_the_environment_protection_%28management_of_contaminated_sites%29_rules%2C_2025.pdf&type=rule (last visited on Oct. 19, 2026).

[10] The National Environmental Management Act, 1998 (Act 107 of 1998), ss. 31B–31D (South Africa), consolidated through June 30, 2023, available at: https://cer.org.za/wp-content/uploads/1999/01/NEMA-108-of-1998-as-amended-by-NEMLAA-30-June-2023.pdf (last visited on Oct. 16, 2026); The National Environmental Management: Waste Act, 2008 (Act 59 of 2008), ss. 20, 26, 67–68 (South Africa), available at: https://www.gov.za/documents/national-environmental-management-waste-act (last visited on Oct. 16, 2026) (official Act and link to amended text).

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and sectoral Acts. Consolidation may improve accessibility, but its practical value depends on who investigates, how evidence is shared and whether remedial obligations survive organizational changes. These operational questions supply the basis for the comparisons that follow.

III. INDUSTRIAL WASTE CASE STUDIES AND ENFORCEMENT DEFICIENCIES

3.1 Bichhri and the implementation of polluter pays

In Indian Council for Enviro-Legal Action v. Union of India, chemical industries in Bichhri, Rajasthan, were responsible for severe contamination associated with toxic industrial residues. The Supreme Court's 1996 judgment applied polluter pays to the cost of remedial measures and recognised the Central Government's powers under sections 3 and 5 of the Environment Act to give effect to that responsibility.[11] The significance of the decision lies in its connection between corporate activity and the financial burden of restoring the affected environment.

The subsequent proceedings reveal the distance between a substantive principle and its execution. In 2011, the Supreme Court criticized the prolongation of litigation after its earlier judgment. It directed payment of Rs. 37.385 crore with compound interest at twelve per cent from November 4, 1997, and provided for recovery as arrears of land revenue if payment was not made within the stipulated period.[12] These were judicial directions addressing unpaid remediation liability. They should not be described as proof that the money was subsequently recovered or that restoration was completed.

Bichhri case therefore reaches a specific conclusion. Recognition of liability can lose practical value when enforcement remains dependent on repeated litigation. A remediation demand requires an identified recovery authority, a schedule and a mechanism for monitoring the environmental work. The case does not establish that India's present statutes contain no execution powers, nor does it justify attributing every later delay to the same causes. It identifies the institutional risk that a favorable judgment becomes the beginning of another prolonged dispute over compliance.

3.2 Shongweni and supervision of a corporate waste facility

Upper Highway Air NPC v. Enviroserve Waste Management (Pty) Ltd. concerned an application to restrict activities at the Shongweni landfill. The judgment records community concerns about odours, regulatory intervention and conditions attached to the suspension of the facility's licence. In June 2018, the High Court dismissed the application for an interim interdict while recognizing

[11] (1996) 3 SCC 212, paras. 65–67, available at: https://indiankanoon.org/doc/1818014/ (last visited on Oct. 16, 2026).

[12] *Indian Council for Enviro-Legal Action v. Union of India*, (2011) 8 SCC 161, paras. 1, 226–230, available at: https://www.advocatekhoj.com/library/judgments/index.php?go=2011/july/indian-council-for-enviro-legal-action-vs-union-of-india-others-july-18-2011-84 (last visited on Oct. 16, 2026).

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the serious effects on the community and the department's continuing supervisory role.[13] This was an interim-relief decision, not a finding that every aspect of the operator's conduct was lawful.

The judgment is valuable because it demonstrates that closing a facility and remediating its waste body are related but distinct decisions. The court considered the regulator's supervision and the permitted remedial activities when assessing the requested injunction. Its reasoning cannot be converted into a general rule that employment or business interests override environmental protection. Rather, the decision required attention to the particular relief sought and the ongoing administrative response.

A subsequent ministerial account in 2021 confirmed EnviroServ's conviction for air-quality contraventions relating to odour. That account described approximately R10 million as the combined fines for EnviroServ and another company; a later official speech attributed that amount to EnviroServ alone. Given this inconsistency, no precise EnviroServ fine is relied upon here.[14] Shongweni remains a waste-facility pollution case rather than an equivalent of clandestine industrial dumping. Its Indian counterpart is principally supervision under rule 16 of the 2016 Rules, which addresses facility operation and closure obligations, alongside the applicable pollution-control legislation.[15]

3.3 Thor Chemicals and prolonged hazardous-waste remediation

Thor Chemicals' Cato Ridge site provides a different comparison. South Africa's 2023/24 enforcement report described a mercury-waste problem extending over approximately thirty years and a clean-up involving treatment in Switzerland. It recorded coordination across levels of government and the logistical difficulties of lawful international waste movement.[16] This official account demonstrates that a jurisdiction with specialised environmental inspectors can still inherit serious and persistent contamination.

The department's 2024/25 annual report subsequently stated that all pre-identified mercury waste had been removed from the property, with 4,773 tonnes of material shipped to the treatment

[13] (3692/2017) [2018] ZAKZDHC 21, paras. 9–17, 29–42 (June 21, 2018), available at: https://www3.saflii.org/za/cases/ZAKZDHC/2018/21.html (last visited on Oct. 16, 2026). The spelling "Enviroserve" follows the reported title of this decision.

[14] Barbara Creecy, Minister of Forestry, Fisheries and the Environment, *Budget Speech to the National Council of Provinces* (2021), available at: https://www.dffe.gov.za/minister-barbara-creecy-delivers-budget-speech-national-council-provinces (last visited on Oct. 16, 2026) (describing the combined fines for ArcelorMittal and EnviroServ); *compare* Narend Singh, Deputy Minister of Forestry, Fisheries and the Environment, *Budget Vote for Forestry, Fisheries and the Environment* (June 27, 2025), available at: https://www.dffe.gov.za/speeches/singh_2022526budgetvote (last visited on Oct. 16, 2026) (attributing R10 million and a 2021 conviction to EnviroServ). The earlier account verifies the existence and subject of the conviction, but the inconsistent amount is not used as a comparative metric.

[15] *Supra* note 3, r. 16(2)–(4) (design approval, regulatory monitoring, safe operation, closure and post-closure obligations).

[16] Department of Forestry, Fisheries and the Environment, "National Environmental Compliance and Enforcement Report 2023/24" 103 (2024), available at: https://www.dffe.gov.za/sites/default/files/reports/research/rcsm/necer2023.24.pdf (last visited on Oct. 16, 2026).

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facility. It also stated that no repacked or unsorted material remained at the site.[17] This is an administrative report of waste removal. It is not an independent verification that surrounding soil, water and ecosystems have been restored to an acceptable condition.

Thor Chemicals and Bichhri suggest that remediation should be assessed through its stages. Identification of waste, removal, treatment and environmental recovery require separate records. The comparative lesson is not that South Africa solved contamination promptly. It is that a long-running problem eventually required sustained technical coordination, which should be designed into enforcement at the outset. For India, the 2025 framework makes this an implementation question with identifiable legal duties rather than a proposal to invent a remediation regime.

IV. COMPARATIVE ANALYSIS OF ENFORCEMENT GAPS

4.1 Investigative capacity and evidence collection

India already grants substantial investigative powers. Sections 10 and 11 of the Environment Act provide for entry, inspection and sampling, with procedural safeguards affecting the admissibility of analytical results. Sections 12–14 address laboratories, analysts and their reports. Under the Water Act, sections 20–23 similarly support information gathering, sampling and inspection.[18] The legal problem cannot therefore be framed simply as an absence of authority to enter factories or collect samples.

The more persuasive evidence concerns capacity. The CAG's Maharashtra audit, tabled in March 2026, recorded 147 field officers against 204 sanctioned posts in 2022/23. It reported only 15,069 visits against 40,619 scheduled visits in that year. Senior and assistant law-officer posts were also vacant during the period identified in the audit.[19] These findings concern the audited institution and years. They nevertheless demonstrate how inspection and legal workloads can exceed available personnel even when enabling powers exist.

South Africa's NEMA sections 31G–31K connect compliance monitoring with investigation, document examination, sampling and specified search or seizure powers. Section 31L enables compliance notices.[20] The useful institutional feature is the deliberate organization of these

[17] Department of Forestry, Fisheries and the Environment, "Annual Report 2024/25" 70 (2025), available at: https://www.dffe.gov.za/sites/default/files/reports/businessperformance/annualreport202425.pdf (last visited on Oct. 16, 2026) (reporting removal of pre-identified mercury waste and shipment of 4,773 tonnes of material).

[18] The Environment (Protection) Act, 1986 (Act 29 of 1986), ss. 10–14; The Water (Prevention and Control of Pollution) Act, 1974 (Act 6 of 1974), ss. 20–23. See particularly The Environment (Protection) Act, 1986 (Act 29 of 1986), s. 11(2)–(4) and The Water (Prevention and Control of Pollution) Act, 1974 (Act 6 of 1974), s. 21(2)–(5) on sampling procedure and evidentiary use.

[19] Comptroller and Auditor General of India, "Report on Compliance and Performance Audit—Civil for the Period Ended March 2023, Government of Maharashtra", Report No. 8, 43–44, paras. 3.1.8.1–3.1.8.2 (2025), available at: https://d7i5wg8xwe4hf.cloudfront.net/uploads/download_audit_report/2023/Chapter-III-069c3cb7b7ebd56.95096160.pdf (last visited on Oct. 16, 2026). The report was tabled on March 25, 2026; the cited figures concern 2022/23, not staffing in October 2026.

[20] The National Environmental Management Act, 1998 (Act 107 of 1998) (South Africa), ss. 31G–31L (as amended by the National Environmental Management Laws Amendment Act 2 of 2022, with relevant provisions effective June 30, 2023).

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functions within a designated inspectorate. India's adaptation could involve trained investigation teams within Pollution Control Boards, supported by shared laboratories and designated prosecutors, rather than another authority duplicating existing mandates.

For dumping cases, the evidentiary objective should be to connect the waste, its source and its movement and the responsible decisions. A chemical sample may establish contamination but not identify who arranged disposal. Transport documents, invoices and correspondence may establish a commercial relationship but not the composition of the material. Investigation must join these strands. Specialization is valuable when it improves that work; giving officers a new designation without time, equipment or legal support would leave the documented capacity problem unresolved.

4.2 From inspection to prosecution and proportionate sanctions

The present Indian penalty structure requires precision. Sections 14A, 15 and 15A of the Environment Act provide monetary penalties for different contraventions. Section 15A provides a company penalty of Rs. 1–15 lakh and an additional Rs. 1 lakh for each day of continuing contravention. Section 15C establishes adjudication, including consideration of harm, duration and undue gain; section 15D provides an appeal to the NGT. Section 15F retains criminal consequences for failure to pay within ninety days and addresses company officers in that context.[21] Consequently, the former general imprisonment provision should not be reproduced as the current sanction for every breach.

The November 2024 amendment to the Hazardous Waste Rules substituted rule 40 to refer contraventions to section 15 of the Environment Act.[22] Under the amended Water Act, section 43 imposes monetary penalties for section 24 contraventions, while section 45E retains imprisonment for failures involving sections 25 and 26. The 2024 Water Amendment initially applies to Himachal Pradesh, Rajasthan and Union territories, extending to other states through adoption. A prosecution analysis must establish the applicable territorial and temporal regime.[23]

South Africa retains a direct criminal route for unauthorized disposal under section 26 read with section 67(1)(a) of its Waste Act. Section 68(1) permits a maximum R10 million fine, ten years' imprisonment, or both for specified offences. Section 68(5) requires attention to severity and

[21] The Environment (Protection) Act, 1986 (Act 29 of 1986), ss. 14A, 15, 15A, 15C–15D, 15F; The Jan Vishwas (Amendment of Provisions) Act, 2023 (Act 18 of 2023), s. 2 and sch. Section 15F(2)–(3) addresses attribution to the company and relevant officers for the non-payment offence, with the statutory qualifications and defences.

[22] The Hazardous and Other Wastes (Management and Transboundary Movement) Second Amendment Rules, 2024, r. 2, G.S.R. 698(E), Gazette of India, Extraordinary, pt. II, sec. 3(i), Nov. 12, 2024; India Code, available at: https://upload.indiacode.nic.in/showfile?actid=AC_CEN_16_18_00011_198629_1517807327582&filename=hhazardous_and_other_wastes_%28management_and_transboundary_movement%29.pdf&type=rule (last visited on Oct. 19, 2026) (substituting rule 40).

[23] The Water (Prevention and Control of Pollution) Amendment Act, 2024 (Act 5 of 2024), ss. 1(2)–(3), 8, 10; *supra* note 6 (India Code text). The amendment substitutes s. 43 and inserts ss. 45A–45E. The chapter does not assume uniform adoption by every state.

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benefits obtained.[24] This creates a useful contrast in legislative design, but maximum sanctions do not establish greater deterrence. Their practical effect depends on detection, proof, prosecution and execution.

The corporate dimension also needs explicit treatment. NEMA section 34(7) addresses directors' failure to take necessary reasonable preventive steps in relation to qualifying offences; it does not justify asserting that every director is automatically convicted whenever pollution occurs.[25] India's section 15F concerns the distinct non-payment offence. The comparison supports examining whether serious, deliberate hazardous-waste misconduct and culpable managerial decisions receive an appropriately differentiated response.

That is a normative concern rather than proof that decriminalisation has increased dumping. The materials examined do not establish such causation. South African enforcement figures also show that an investigation does not guarantee prosecution: a 2025 official account reported prosecution decisions for 45.53 per cent of 1,902 completed dockets submitted over five years. Those figures cover environmental enforcement generally, not industrial waste alone.[26] The practical lesson is to improve case preparation and record reasons for enforcement choices, while reserving criminal proceedings for conduct satisfying the applicable offence.

4.3 Responsibility across the waste chain and contaminated land

India's 2016 Rules already distribute responsibility across waste movement. Rule 18 regulates transport, rule 19 establishes the manifest system, rule 20 requires records and returns, and rule 23 addresses damage arising from improper management.[27] A generator's authorization or a transport contract should therefore be examined alongside evidence of delivery and lawful acceptance. The regulatory question is whether the documented chain corresponds to the physical movement of waste.

The CAG's West Bengal audit covering 2012–17 found deficiencies in hazardous-waste oversight. Its executive summary reported that fourteen per cent of the identified generating units resorted to illegal disposal and that the department acknowledged annual returns from only forty

[24] The National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (South Africa), ss. 26(1), 67(1)(a), 68(1), 68(5). The imprisonment provision applies to persons capable of imprisonment; corporate and individual liability require the applicable attribution rules.

[25] The National Environmental Management Act, 1998 (Act 107 of 1998) (South Africa), s. 34(7) and sch. 3. The subsection requires the specified connection between the firm's offence and the director's failure to take reasonable preventive steps, and contains a prima facie evidentiary provision.

[26] Singh, *supra* note 14 (reporting completed dockets and prosecution decisions over the preceding five years). These figures are not conviction figures and are not confined to pollution and waste cases.

[27] *Supra* note 3, rr. 18–20, 23(1). Rule 23(1) addresses liability of the occupier, importer or exporter and disposal-facility operator for environmental or third-party damage from improper handling and management; transport responsibilities must be read with rule 18.

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per cent of units in 2016/17.[28] These are historical, state-specific findings. They support scrutiny of records and reconciliation, but do not establish that every unreported consignment was dumped or that these proportions describe contemporary India.

South Africa's Waste Act combines a general duty in section 16 with the disposal prohibition in section 26. Sections 36–41 provide a sequence involving investigation, assessment, remediation orders, transfer controls and a contaminated-land register.[29] The comparative advantage to examine is the continuity of responsibility and information across these stages. A single statute is useful only if the authorities actually connect its records and decisions.

India's 2025 Rules substantially narrow any claimed legislative gap. Rule 4 governs identification and assessment; rule 5 addresses responsible persons and remediation. Rule 5(3) assigns responsibility to a transferee where the contaminating transferor has transferred the site.[30] That provision raises a specific question for administration and interpretation: how should land-transfer responsibility interact with the liability of those who generated, transported or deposited the waste? The study does not assume that the provision extinguishes every other statutory liability. It identifies the need for reasoned attribution that prevents the transfer of land from obscuring the conduct being investigated.

A workable Indian reform would connect manifest discrepancies with contaminated-site inquiries. Repeated differences between quantities dispatched and accepted should trigger verification, not an automatic presumption of guilt. Records should identify the relevant company, facility and authorized operator throughout. This approach strengthens existing obligations and directs scarce inspection resources towards discrepancies that can be investigated.

4.4 Transparency and accountability for enforcement outcomes

India requires environmental information to be recorded. Section 39 of the Water Act provides for annual reports. Rule 20 of the Hazardous Waste Rules requires records and returns, while rule 9 of the 2025 contaminated-sites rules provides a centralized portal.[31] The question is whether separate records permit scrutiny of what happened after a violation was detected.

South Africa's National Environmental Compliance and Enforcement Reports provide a useful organizational model. Its official 2022/23 summary separately reports inspections, detected non-compliances, criminal dockets and convictions. It records 359 dockets handed to the prosecuting

[28] Comptroller and Auditor General of India, "Performance Audit of Pollution by Industries in West Bengal", Report No. 5, viii, 38–43 (2018), available at: https://cag.gov.in/webroot/uploads/download_audit_report/2018/Report_No_5_of_2018_Performance_Audit_of_Pollution_by_Industries_in_West_Bengal_Government_of_West_Bengal.pdf (last visited on Oct. 16, 2026) (audit period 2012/13–2016/17; hazardous-waste monitoring and institutional capacity findings).

[29] The National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (South Africa), ss. 16, 26, 36–41. See particularly ss. 39–41 on remediation orders, transfer of remediation sites and the contaminated-land register.

[30] *Supra* note 9, rr. 4–5, especially r. 5(2)–(5). Rule 2 specifies exclusions and a mixed-contamination qualification; the rules should not be treated as universally applicable to every category of polluted land.

[31] The Water (Prevention and Control of Pollution) Act, 1974 (Act 6 of 1974), s. 39; *Supra* note 3, r. 20; *Supra* note 9, r. 9. These are legal reporting requirements; their citation does not assert complete or uniform implementation.

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authority and 91 successful convictions during that year.[32] These are different reporting measures; dividing the convictions by that year's referrals would not establish a valid conviction rate because the cases may belong to different cohorts.

The reporting system also exposes weakness. In 2024/25, only forty-three of 169 scored municipal landfill sites were assessed as adequately compliant.[33] Municipal sites are outside the study's central corporate focus, and the statistic is not a national industrial-waste compliance rate. Its relevance is methodological: useful reporting must disclose unsatisfactory outcomes as well as enforcement activity. A comparator becomes more informative when its deficiencies are visible.

For India, the proposed improvement is a connected account of each enforcement matter. A facility identifier could link the initial inspection, legal provision breached, response, challenge, amount recovered and remedial status. Publication should distinguish allegations from final findings and explain whether an order has been stayed. Aggregate statistics should preserve these distinctions. A rise in notices can indicate improved detection or persistent violations; without subsequent outcomes, it cannot establish effective enforcement.

4.5 Restoration and recovery of costs

India possesses several legal routes to restoration. Sections 15 and 17 of the NGT Act concern relief and liability, while section 25 supports execution of Tribunal orders. Section 26 separately addresses failure to comply. The Environment Act's section 15C(5) preserves compensatory liability in addition to statutory monetary penalties.[34] A payment imposed for contravention should therefore not be equated with a complete assessment of the cost of environmental damage.

The 2025 Rules make the current position more concrete. Rule 5(5) requires an identified responsible person to bear remediation expenses. Rule 6 provides verification and completion procedures, including post-remediation monitoring; rule 8 addresses financing and recovery.[35] Recommendations for time-bound remediation or verification must build on these provisions.

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[32] Department of Forestry, Fisheries and the Environment, "2022/23 National Environmental Compliance and Enforcement Report Shows a Significant Increase in the Reporting of Environmental Crimes by South Africans" (2023), available at: https://www.gov.za/news/media-statements/forestry-fisheries-and-environment-202223-national-environmental-compliance (last visited on Oct. 16, 2026) (official summary reporting 359 dockets handed to the National Prosecuting Authority and 91 successful convictions).

[33] Department of Forestry, Fisheries and the Environment, "National Environmental Compliance and Enforcement Report 2024/25" sec. 8.2, table 1 (2025), available at: https://www.dffe.gov.za/sites/default/files/reports/research/rcsm/necerreport_24-25.pdf (last visited on Oct. 16, 2026) (190 sites inspected, 169 scored and 43 adequately compliant).

[34] The National Green Tribunal Act, 2010 (Act 19 of 2010), ss. 15, 17, 25–26; The Environment (Protection) Act, 1986 (Act 29 of 1986), s. 15C(5). Section 25 concerns execution of Tribunal awards and orders; it should not be treated as automatically governing every administrative demand issued by a Pollution Control Board.

[35] *Supra* note 9, rr. 5(5), 6(1)–(8), 8(5)–(7). Rule 6 provides for central review, possible additional remediation, a completion order and post-remediation monitoring; rule 8 addresses recovery of expenditure and funding for orphan sites.

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The mere existence of a statutory sequence does not demonstrate that it has been implemented at every contaminated site, and the historical cases cannot prove failure of rules enacted much later. South Africa's NEMA section 28 provides a duty of care, remedial directions and recovery mechanisms. Waste Act section 39 provides for remediation orders, while section 41 concerns the register.[36] These provisions supply a comparison of implementation responsibilities rather than an entirely different remedial principle.

Authorities should record the approved remediation target, work completed, verification results and any continuing restrictions. Where treatment is phased, the report should say so. Where recovery is pending, emergency protection should be considered separately under the available powers. Combining these records would make it harder for payment, removal or administrative closure to be presented as comprehensive restoration without supporting evidence.

V. REFORMS TO THE INDIAN SYSTEM

5.1 Strengthening investigation within existing authorities

India should begin with capacity linked to its existing powers under Environment Act sections 10–14 and Water Act sections 20–23. Pollution Control Boards could designate teams for serious waste violations, combining technical officers with legal support. Regional arrangements could provide specialist sampling and digital-evidence assistance where individual boards cannot maintain these services. The Maharashtra audit gives a concrete reason to priorities staffing and protected inspection time before creating additional organizational layers.

Such teams should have written procedures for sampling, chain of custody, identification of decision-makers and preservation of transport records. Training should include the evidentiary requirements of the forum receiving the case. The South African inspectorate is relevant as an organizational example, but its powers should not be copied without considering India's statutory allocation of functions and procedural safeguards. Success should be measured by reliable investigations and corrected violations, rather than by a target number of prosecutions.

5.2 Establishing reasoned enforcement and referral procedures

Regulators should adopt a published decision framework identifying the applicable administrative, remedial and criminal routes. It should distinguish urgent containment from later adjudication and require reasons for repeated extensions of compliance deadlines. For criminal matters, legal review should occur early enough to identify missing evidence. An investigation should not be called complete merely because a notice was issued or a file forwarded elsewhere.

A legislative review should separately consider an aggravated offence for deliberate or reckless hazardous-waste dumping causing serious harm or risk, with clear rules for corporate and managerial attribution. This is a proposed reform, not a description of an existing uniform offence. It should be assessed alongside the current Environment Act penalties and the territorially applicable Water Act provisions. Monetary sanctions can address appropriate

[36] The National Environmental Management Act, 1998 (Act 107 of 1998) (South Africa), s. 28(1), (4), (7)–(11); The National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (South Africa), ss. 39, 41.

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regulatory breaches, while the justification for criminal punishment should turn on culpability and seriousness. Both routes require fair procedures and should preserve restoration obligations.

5.3 Making waste records verifiable

Implementation of rules 18–20 should priorities reconciliation between generator, transporter and receiving facility. A common consignment identifier, recorded acceptance and alerts for unresolved discrepancies would help operationalize existing duties. Any mandatory technological additions should be introduced through a lawful instrument and accompanied by support for smaller operators. The reform should avoid assuming that a digital entry proves physical compliance.

Inspection programmes should test records against facility capacity and observed quantities. A receiver accepting implausible volumes warrants scrutiny even if its authorization is valid. Similarly, a generator's selection of an authorized contractor should not end the inquiry where delivery records conflict. These measures make the existing authorization system more informative without treating every paperwork error as intentional dumping.

5.4 Publishing outcomes that can be followed

India should develop a common reporting format that connects existing returns and annual reports. It should distinguish action proposed, action ordered, proceedings pending and compliance verified. Financial figures should separately show amounts imposed, recovered and applied to remediation. Public summaries should identify the period covered and the status of challenges so that neither a pending allegation nor an unpaid demand is represented as a completed enforcement result.

A pilot across selected industrial clusters would allow boards to test reporting burdens and data quality. Complaints should receive identifiers and a recorded response, helping communities supply information without requiring them to replace public investigators. UNEP's emphasis on standardized environmental-rule-of-law indicators supports this direction.[37] Implementation would still need data protection, correction procedures and narrowly justified limits for information whose release could prejudice a live investigation.

5.5 Securing and verifying remediation

The immediate priority is operationalizing rules 4–9 of the 2025 framework. Each confirmed site should have an identified responsible authority, a financed plan and publicly intelligible milestones. Verification should distinguish removal of waste from attainment of the applicable remediation target. Independent technical review should be insulated from conflicts of interest, and post-remediation monitoring should continue where the approved conditions require it.

For high-risk facilities, policymakers should evaluate proportionate financial security for closure and remediation. Any new requirement needs a clear legal basis, periodic review of the estimated

[37] United Nations Environment Programme, *supra* note 2 (recommendation to standardise and track environmental-rule-of-law indicators).

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cost and protection against avoidable burdens on compliant operators. The purpose is to reduce the risk that a future liability becomes uncollectable. Financial security should supplement, rather than cap or extinguish, liability otherwise imposed by law. This proposal follows from the implementation risks demonstrated by the cases; it is not presented as a universally applicable requirement already established in either jurisdiction.

VI. CONCLUSION

India's industrial-waste problem cannot be explained through a general absence of environmental law. The statutory framework already regulates inspection, consent, hazardous-waste movement, compensatory liability and restoration. The evidence examined identifies more specific vulnerabilities: insufficient monitoring capacity, weak reconciliation of waste records and difficulty translating legal responsibility into completed remedial action. Recent penalty reforms also require a renewed examination of how serious corporate wrongdoing is distinguished from ordinary regulatory non-compliance.

South Africa offers useful mechanisms for that examination, particularly specialized inspectors and structured reporting. Its prolonged contamination cases and incomplete compliance show why those mechanisms should be assessed critically.

The strongest reform programme would connect existing powers across the life of an enforcement matter. It would improve investigation, explain the choice of legal response, preserve responsibility across waste transfers and demonstrate whether restoration has actually occurred. India's 2025 contaminated-sites framework creates an important opportunity to pursue these objectives within domestic law. Corporate accountability becomes meaningful when the institutions applying that law can establish responsibility and carry the resulting obligations through to a verifiable environmental outcome.