
BEYOND THE BIN: MEASUREMENT, PRECAUTION AND ATTRIBUTION IN INDIA'S REGULATION OF MICROPLASTIC POLLUTION

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ABSTRACT

Indian environmental law today contains a statutory definition of microplastics, a binding prohibition on plastic microbeads in cosmetic formulations, and an elaborate producer-responsibility regime for plastic packaging. It nevertheless remains incapable of establishing, in a form a court or an adjudicating officer could act upon, how much microplastic is present in an Indian river. This project treats that incapacity as a legal defect rather than a scientific one. Working principally from material filed before the National Green Tribunal between 2022 and 2026, it argues that three deficiencies operate together to sustain a regulatory stalemate: an unfilled measurement vacuum, an inverted use of the precautionary principle, and the unavailability of attribution for diffuse releases. Comparison with the European Union shows that microplastic regulation has been built elsewhere in three legal grammars Indian law has scarcely used. The study proposes a sequenced architecture beginning with method-setting rather than limit-setting, each step located within a statutory power India already possesses.

CHAPTER I: A POLLUTANT THE LAW CANNOT COUNT

1.1 An instruction that could not be conducted.

On 21 January 2026, in the course of supervising the long-running proceedings concerning the River Ganga, the National Green Tribunal issued the Central Pollution Control Board a direction that appears, on its face, entirely routine. Photographs placed before the Tribunal showed drains choked with plastic waste in the Bihar reach of the river. The Board was accordingly asked to collect samples and ascertain whether microplastics were present in the water.¹

Three months later the Board filed a reply that should interest constitutional and administrative lawyers more than it interests scientists. Its water laboratory, the Board reported, possesses neither the instruments nor the infrastructure required to test water for microplastics. It had explored routing the work through research institutions near Bihar with recognised expertise, and declined on a specifically legal ground: because no standardised sampling and analytical methodology exists in the country, figures produced using whichever protocol a research group happens to prefer would not be dependable for regulatory or judicial purposes.²

The Board then wrote to the Bureau of Indian Standards; the body charged with formulating standards nationally. The reply of 8 April 2026 was unambiguous. No Indian Standard governing the specification, sampling or testing of microplastics in drinking water or river water has been published. Two international texts are before the Water Quality Sectional Committee for possible adoption, and a dedicated working group on emerging contaminants has been constituted to consider whether microplastics and per- and polyfluoroalkyl substances should enter the revision of the national drinking water specification.³ Compliance with the Tribunal's direction, the Board concluded, was for the present constrained by the absence of notified standards and methods.⁵

The sequence deserves to be stated plainly. A tribunal exercising statutory jurisdiction

¹*M.C. Mehta v Union of India*, Original Application No 200/2014, National Green Tribunal (Principal Bench), order dated 21 January 2026, para 10.

²Compliance Report on behalf of the Central Pollution Control Board in OA No 200/2014, filed 20 April 2026, pp 1-2.

³*ibid* p 1.

⁴Bureau of Indian Standards, communication to the Central Pollution Control Board dated 8 April 2026, annexed to the compliance report (n 2) as Annexure III.

⁵Compliance Report (n 2) p 2.

gave a direction. The expert regulator reported that the direction could not be executed. The obstacle was neither obstruction nor want of funds. It was the absence of a notified method of measurement.

1.2 Why this is a doctrinal problem and not a laboratory problem.

Existing scholarship, and the preliminary framing of this project, has approached microplastics through the distinction between waste and emission: India regulates plastic as a product and as a discarded object, whereas microplastic pollution arises across a product's life and therefore escapes a waste-centred regime. That distinction is sound so far as it goes, but it does not reach the deeper difficulty, which lies in the drafting of the pollution statutes themselves.

Under the Environment (Protection) Act 1986, “an environmental pollutant is a solid, liquid or gaseous substance present in such concentration as may be, or tend to be, injurious to the environment.”⁶ The Water Act of 1974 defines pollution by reference to “contamination or alteration of properties such as may render water harmful or injurious to specified uses.”⁷ The Air Act of 1981 speaks of any airborne agent existing in concentrations capable of posing a risk to health or the environment.⁸ Two of these three definitions are expressly concentration-contingent, and the third is effects-contingent in a manner that in practice requires quantification before a consent condition can be written or a contravention proved.

The consequence is more serious than the absence of a numerical limit. Where no accepted method of quantification exists, a substance is not merely unregulated; for operative purposes it falls outside the statutory concept of a pollutant altogether. One cannot write a consent condition that cannot be verified, compute compensation for a quantity that cannot be established, or sustain an adjudication resting on a figure the regulator itself declines to vouch for. The measurement gap is therefore anterior to both the standards gap and the enforcement gap. That is the central claim of this study.

Around that claim, two further defects arrange themselves. The first is that the precautionary principle, which Indian courts have treated as part of domestic law for three decades, has been applied by the executive to the wrong question, with the result that it now

⁶ Environment (Protection) Act 1986, § 2(b).

⁷ Water (Prevention and Control of Pollution) Act 1974, § 2(e).

⁸ Air (Prevention and Control of Pollution) Act 1981, § 2(a), as amended in 1987.

operates as a reason for inaction rather than for protective action. The second is that the liability doctrines on which Indian environmental law relies presuppose an identifiable enterprise, and microplastic releases from tyres, textiles and degrading products do not supply one. The three defects are mutually reinforcing, and the argument developed below is that they must be addressed in a particular order.

CHAPTER II: RESEARCH DESIGN

2.1 Statement of the problem

The problem investigated is whether India's environmental regulatory framework is presently capable of preventing, monitoring, attributing and controlling microplastic pollution; and if not, whether the obstacle lies in the absence of substantive rules or in the absence of the institutional preconditions that would make such rules operable.

2.2 Research questions

First, what does Indian law presently say about microplastics, and where in the statutory structure does it say it? Second, what legal consequences follow from the absence of a notified measurement method? Third, has the precautionary principle as developed by the Supreme Court been correctly applied by Indian regulators? Fourth, can polluter pay and extended producer responsibility be adapted to releases occurring during lawful consumer use? Fifth, which features of the European approach can be adapted to Indian conditions, and in what sequence?

2.3 Hypothesis

India's difficulty is not an absence of regulation but a mismatch between statutes drafted in a vocabulary of concentration and an apparatus that cannot produce a concentration figure. Measures that do not depend on quantification, namely operational duties, design specifications and disclosure, are therefore both legally available and presently unused, while measures that do depend on it cannot be introduced until a method is notified.

2.4 Method and sources

The study is doctrinal and comparative. Its primary materials are the Constitution, the three principal pollution statutes and their subordinate legislation, gazette notifications, orders of the

National Green Tribunal together with the compliance affidavits and inter-departmental correspondence placed on its record, orders of the Madras High Court and the Supreme Court, and standards issued by the Bureau of Indian Standards. Comparative material is drawn from European legislation in its published form. Scientific literature is used only to establish the state of knowledge the law must accommodate.

2.5 Limitations

Three limitations are acknowledged. Scientific understanding of microplastic toxicity remains unsettled and the study takes no position on it. Several proceedings discussed remain pending, and the analysis states the position as of September 2026. The study does not attempt an empirical assessment of State Board capacity, which would require field research beyond a doctrinal project's scope.

CHAPTER III: WHAT INDIAN LAW ACTUALLY SAYS

3.1 A definition that does no regulatory work.

It is commonly asserted that Indian law contains no definition of microplastics. That is incorrect. The Plastic Waste Management (Amendment) Rules 2024 inserted one: “a solid plastic particle, insoluble in water, with dimensions between one micron and one thousand microns.”⁹ Three features of that definition are worth noticing.

First, its upper bound is one millimetre, whereas the convention in the scientific literature, at the World Health Organization and in the European restriction is five millimetres.¹⁰ India has therefore adopted a definition excluding four-fifths of the size range the rest of the world counts. Second, the lower bound of one micron excludes nanoplastics, notwithstanding that the Madras High Court has since brought the composite expression micro and nano plastics into operative use on product labels. Third, and most consequentially, the definition was not introduced to regulate microplastics at all. It was introduced to tighten the criteria for describing a product as biodegradable, such a plastic qualifying only if it degrades without leaving microplastics behind. It therefore functions as a certification criterion for bioplastics and

⁹Plastic Waste Management (Amendment) Rules 2024, GSR 201(E), 14 March 2024, amending r 3 of the Plastic Waste Management Rules 2016.

¹⁰Commission Regulation (EU) 2023/2055 of 25 September 2023 amending Annex XVII to Regulation (EC) No 1907/2006 as regards synthetic polymer microparticles, entry 78, para 3.

nothing more, and the Rules prescribe neither the analytical method by which absence is to be established nor the extent of reduction that constitutes absence. A definition without a test is a description, not a standard.

3.2 The only genuine prohibition sits outside environmental law.

India does prohibit intentionally added microplastics, but it does so through cosmetics standards rather than through pollution law. Amendment No 2 to IS 4707 (Part 2): 2017 added plastic microbeads to the list of raw materials not recognised as safe for use in cosmetics, with effect from 10 November 2017.¹¹ That standard has since been replaced by the fifth revision, mandatory from 9 February 2026.¹² The prohibition takes legal effect because the Ninth Schedule to the Cosmetics Rules 2020 incorporates the relevant Bureau standards into a regime made under the Drugs and Cosmetics Act 1940.¹³

The placement matters. Enforcement lies with the drug and cosmetics administration rather than with State Pollution Control Boards, and the available consequences are product-safety consequences: refusal of licence, seizure, prosecution under the parent Act. Environmental compensation is unavailable, because the prohibition is not a rule made under the Environment (Protection) Act. No reporting obligation attaches, so the State acquires no information about quantities used before the ban or still used in categories not covered. India has a microbead ban that generates no environmental data and attracts no environmental remedy.

3.3 The waste architecture and its unit of account

The Plastic Waste Management Rules 2016 have been amended repeatedly. The 2021 amendments prohibited identified single-use items; the 2022 amendments introduced mandatory extended producer responsibility guidelines with environmental compensation on a polluter pays footing.¹⁴ January 2025 brought barcode and quick-response code traceability

¹¹Bureau of Indian Standards, IS 4707 (Part 2): 2017, Amendment No 2 (effective 10 November 2017), Annex A, entry 1373.

¹²IS 4707 (Part 2): 2025, List of GNRAS and Restricted Ingredients (fifth revision), made mandatory with effect from 9 February 2026.

¹³Cosmetics Rules 2020, Ninth Schedule, framed under the Drugs and Cosmetics Act 1940.

¹⁴Plastic Waste Management (Amendment) Rules 2021, Ministry of Environment, Forest and Climate Change Notification, GSR 571(E); Plastic Waste Management (Amendment) Rules 2022, Ministry of Environment, Forest and Climate Change Notification, GSR 133(E).

and strengthened penal provisions.¹⁵ The 2026 amendments went further still.¹⁶ They escalate mandatory recycled content across three packaging categories, rising for rigid packaging from thirty per cent in 2025-26 to sixty per cent by 2028-29; impose reuse obligations reaching eighty-five per cent for large drinking water containers; require conformity to a specified Indian Standard with content labelling; introduce Registered Environment Auditors as a verification route; devolve enforcement to local bodies and panchayats; and reconstitute State Level Monitoring Committees under the Chief Secretary.¹⁷ The Solid Waste Management Rules 2026 add mandatory four-stream segregation at source.¹⁸

This is a substantial and, on its own terms, a maturing regime. Its limitation for present purposes is structural rather than a matter of stringency. Every obligation it creates is denominated in tonnes of packaging placed on the market and tonnes recovered, recycled or reused. It is a mass-balance accounting system. It can establish how much plastic a producer introduced into commerce and how much was accounted for at end of life. It cannot establish how much polymer left a tyre on a highway, a garment in a washing machine, or a weathering sheet of agricultural mulch. Increasing the stringency of a mass-balance obligation does not convert it into an emission obligation, because the two are denominated in different units.

3.4 A penalty regime that presupposes quantification.

The Jan Vishwas (Amendment of Provisions) Act 2023 replaced the criminal sanctions in sections 15 to 17 of the Environment (Protection) Act with an administrative penalty framework operative from 1 April 2024, penalties extending to fifteen lakh rupees, with separate company liability and imprisonment arising only on default in payment.¹⁹ That shift has a consequence directly relevant here. An adjudicating officer must find a contravention on evidence, and where the contravention consists in the release of a substance, the evidence must establish what was released and in what quantity. The move from prosecution to administrative

¹⁵Plastic Waste Management (Amendment) Rules 2025 notified 23 January 2025, with labelling obligations operative from 1 July 2025.

¹⁶Plastic Waste Management (Amendment) Rules 2026, GSR 237(E), 31 March 2026, framed under ss 3, 6 and 25 of the Environment (Protection) Act 1986, following draft notification GSR 365(E) of 3 June 2025.

¹⁷*ibid*, Schedule II as substituted; r 11(2) as substituted; r 12, sub-rules (3A) to (3C) as inserted; r 16 as substituted; r 17(5) read with the Environment Audit Rules 2025.

¹⁸Solid Waste Management Rules 2026 notified 29 January 2026 in supersession of the Solid Waste Management Rules 2016, operative from 1 April 2026.

¹⁹Jan Vishwas (Amendment of Provisions) Act 2023, amending ss 15 to 17 of the Environment (Protection) Act 1986 with effect from 1 April 2024; see ss 15, 15A and 15F of the amended Act.

adjudication therefore increases the system's dependence on notified analytical methods.

CHAPTER IV: THE MEASUREMENT VACUUM AS A LEGAL DEFECT

4.1 A loop that closes on itself.

The Ganga episode of 2026 is not an isolated administrative failure. It is the predictable output of a structure that has been visible on the Tribunal's record since 2021. In that year the Southern Zone bench initiated suo motu proceedings on airborne microplastics in Chennai, in the course of which the Central Pollution Control Board carried out work with the National Centre for Sustainable Coastal Management on landfill leachate and groundwater.²⁰ On 5 April 2022 the Principal Bench took up a newspaper report on the detection of microplastics in human blood, transferred the Southern Zone matters to itself, and constituted an expert committee comprising the Board, the Indian Council of Medical Research, the Central Institute of Petrochemicals Engineering and Technology and the coastal management centre, with a mandate that expressly extended to standards for a safe environment and with expenditure to be met from environmental compensation funds.²¹

The committee's report of February 2023 is careful and its findings uncomfortable. No standard method exists for sampling and analysing microplastics. The methods used by Indian institutions are broadly similar but differ in detail, and results are reported in units that are not mutually comparable. The quantum generated at most identified sources has never been determined, and monitoring has concentrated on coastal areas.²² The Board's own 2022 study nevertheless produced concrete figures, detecting microplastics in landfill leachate, in groundwater around two Chennai dumpsites and in ambient air at both.²³ On health, the medical research body reported that microplastics have been found in human tissue but physiological effects have not been demonstrated, that the genotoxicity work available is limited to in vitro studies on very small samples, and that it would not be appropriate to set drinking water standards without establishing a cause and effect relationship.²⁴ The report's eighteenth

²⁰In re News item published in The Times of India dated 5 April 2021 titled 'Chennai, you are breathing micro plastic', OA No 99/2021 (SZ), and the connected OA No 174/2021 (SZ), both transferred to the Principal Bench by order dated 5 April 2022.

²¹In re News item published in The Hindu dated 29 March 2022 titled 'Detecting microplastics in human blood', OA No 251/2022, NGT (Principal Bench), order dated 5 April 2022 (Goel CP), paras 2 and 4.

²²Central Pollution Control Board, Report in OA No 251/2022 dated 8 February 2023, section 2.5 and section C, conclusions 4 to 7.

²³ibid, Tables 3.3, 3.6 and 3.7 (CPCB study 2022, Kodungaiyur and Perungudi, Chennai).

²⁴ibid, section 4.2 (position communicated by the Indian Council of Medical Research).

conclusion accordingly recommended that source and ambient standards be developed only after that relationship was established.²⁵

Read alongside the compliance report of April 2026, that recommendation reveals a closed loop. Standards await proof of harm. Proof of harm requires exposure data. Exposure data requires systematic monitoring. Monitoring requires a notified method. The notification of a method is deferred pending international standardisation. Each link is individually defensible. The aggregate is paralysis, and the paralysis is self-sealing: because no monitoring is done, no data accumulates; because no data accumulates, the condition for standard-setting is never satisfied; and because no standard exists, monitoring is never required.

The loop is visible in a second place. The Bureau of Indian Standards has sought five years of national data on emerging contaminants, including microplastics, from the Central Pollution Control Board, the Department of Drinking Water and Sanitation and the Central Ground Water Board, in order to support a systematic revision of the drinking water specification. The groundwater board has replied that it holds no microplastics data at all; the other two datasets remain awaited.²⁶ The revision of the national drinking water standard is thus itself held up for want of data that the monitoring vacuum has prevented anyone from generating.

4.2 The Tribunal saw the difficulty and said so.

It would be unfair to suggest that the judiciary has acquiesced. By an order of 31 January 2024 in the same proceedings, the Tribunal held that although studies should be completed expeditiously, interventions ought not to await their conclusion, and identified the design and manufacture of textiles, tyres, laundry detergents, road surfaces and vehicles, together with restrictions on personal care and cosmetic products containing microplastics, as matters requiring immediate attention by the concerned Ministries.²⁷ That order is, in substance, an instruction to adopt precisely the class of measures that does not depend on quantification. It has not been acted upon in any legislative form.

²⁵ibid, section C, conclusion 18.

²⁶Bureau of Indian Standards communication (n 4), recording that the Central Ground Water Board holds no microplastics data and that data from the Central Pollution Control Board and the Department of Drinking Water and Sanitation remains awaited.

²⁷Order dated 31 January 2024 in OA No 251/2022, as recorded in subsequent NGT proceedings; see *In re News item titled 'Microplastic in West Bengal'*, extracted at para 6.

4.3 Why method-setting is a question of legality.

It may be objected that prescribing analytical protocols is technical housekeeping unworthy of doctrinal attention. The objection misconceives the function of a notified method in a consent-based system. Consents under the Water and Air Acts are granted subject to conditions, and a condition that cannot be objectively verified is, in practice, no condition at all.²⁸ Environmental compensation must be computed on a basis defensible on appeal, and an adjudication under the amended Environment (Protection) Act requires proof of the contravention alleged. In each case the notified method is what converts an observation into evidence.

Seen in that light, the Board's refusal in April 2026 to rely on research protocols was not evasion but legal correctness. A regulator that founded a penalty, or a court that founded a mandatory order, on a figure generated by a method the State has never adopted would be exposed to the charge that the figure was arbitrary. The Board's scruple and the Board's incapacity are, in this instance, the same fact, and that is precisely what makes the episode a doctrinal rather than merely an administrative failure.

CHAPTER V: PRECAUTION, INVERTED

5.1 What the Supreme Court actually decided.

In Vellore Citizens Welfare Forum the Supreme Court held that the precautionary and polluter pays principles form part of the environmental law of the country, drawing them from Article 21 read with Articles 47, 48A and 51A(g), and stated precaution in a form containing an express onus: the burden of showing that an action is environmentally benign rests on the actor or developer.²⁹ In *A P Pollution Control Board v Prof M V Nayudu* the Court examined scientific uncertainty and adjudication at length, describing the shift from an assimilative capacity model, which tolerates discharge until harm is demonstrated, to a precautionary model requiring anticipatory action and placing the evidentiary burden on the party proposing to alter the existing position.³⁰ The approach was carried forward in the hazardous substances

²⁸Water (Prevention and Control of Pollution) Act 1974, §§ 25 and 26; Air (Prevention and Control of Pollution) Act 1981, § 21.

²⁹*Vellore Citizens Welfare Forum v Union of India* (1996) 5 SCC 647, paras 11 to 13.

³⁰*A P Pollution Control Board v Prof M V Nayudu* (1999) 2 SCC 718, paras 27 to 38.

litigation.³¹

5.2 The regulator applied the principle to the wrong question.

Against that background, the position taken in the 2023 expert committee report is striking. To recommend that standards be developed only after a cause and effect relationship between microplastics and human health has been established is to require demonstrated injury as the trigger for regulatory response. That is the assimilative capacity model which Nayudu expressly identified as superseded. It also reverses the onus that Vellore assigned: the evidentiary burden of establishing harm is placed upon the regulator, and therefore upon the public, rather than upon those introducing the substance into commerce.

The criticism must be stated with care, because in one respect the regulator is right. Precaution does not oblige a State to notify a numerical limit for a drinking water contaminant without dose-response data; such a limit would be arbitrary in a different way. But a numerical limit is only one measure precaution can require. Notifying a measurement method, compiling a source inventory, imposing handling duties on industrial operators, specifying design requirements for products known to shed, and mandating disclosure are all protective, all proportionate to uncertainty, and none requires dose-response data. The error is not that the regulator invoked uncertainty; it is that it allowed uncertainty about one measure to justify inaction on every measure. Indian practice has collapsed the distinction between a threshold standard and a precautionary measure.

5.3 Precaution entered through the food law instead.

The most significant Indian development arrived from an unexpected direction. On 6 February 2026 a special Division Bench of the Madras High Court, hearing proceedings on the enforcement of Tamil Nadu's prohibition on single-use plastics, directed “the Union Ministry of Health and Family Welfare and the Food Safety and Standards Authority of India” to notify a requirement that polyethylene terephthalate bottles containing water, and plastic packaging for salt and sugar, carry a warning in bold red type stating that the contents may contain micro or nano plastics.³² The Court relied on a project report detecting microplastics in bottled water

³¹*Research Foundation for Science, Technology and Natural Resource Policy v Union of India* (2005) 10 SCC 510.

³²Order dated 6 February 2026 of the special Division Bench of the Madras High Court (N Sathish Kumar and D Bharatha Chakravarthy JJ), passed in proceedings concerning the enforcement of the prohibition on single-use

drawn from six States and Union Territories and in salt and sugar, iodised salt showing the highest counts, and on an interim medical report measuring bisphenol A in cord blood above the tolerable daily intake. Although the food authority submitted that the studies were at a nascent stage, the Court held the initial findings sufficient, that safety was the primary consideration, and that withholding the information could amount to misleading by omission under the food safety legislation.³³

The industry challenge failed at the first attempt. On 6 April 2026 the Supreme Court declined to interfere, observing that there was nothing objectionable in cautioning consumers where reports indicated the presence of microplastics.³⁴ The Union and the food authority subsequently withdrew their own petition and filed a review before the High Court, arguing that the science remains inconclusive and that a mandatory warning would generate public alarm and disrupt supply chains; those applications, together with a recall application by the packaging association and an impleadment application by a manufacturers' federation, remain pending.³⁵

5.4 Three lessons from the labelling litigation

The episode repays close reading. The first lesson is institutional. Precaution entered Indian microplastic regulation through consumer information law rather than pollution control law, and through a High Court rather than the executive. The environmental regulator that possesses the statutory rule-making power took the cautious view; the food regulator that lacked the initiative was compelled to act by a court exercising environmental jurisdiction.

The second lesson concerns instrument choice, and it is the more important of the two. Disclosure is the single instrument that does not require a measurement method. A statement that a product may contain a substance is a claim about possibility, not about quantity. That is exactly why it was available when nothing else was. The preliminary framing of this project treated information-based regulation, including eco-labelling and certification, as a weak and

plastics in Tamil Nadu.

³³Food Safety and Standards Act 2006, § 3(1) (zf) read with § 24 and the labelling regulations framed thereunder.

³⁴*Pet Packaging Association for Clean Environment v G Subramania Koushik*, order of the Supreme Court dated 6 April 2026 (Vikram Nath and Sandeep Mehta JJ).

³⁵The special leave petition of the Union Ministry of Health and Family Welfare and the Food Safety and Standards Authority of India was dismissed as withdrawn on 18 May 2026; the review application, accompanied by an application to condone a delay of 151 days, was listed before the special Division Bench on 7 September 2026.

largely voluntary substitute for binding standards. The Indian experience suggests the opposite conclusion: in a measurement vacuum, disclosure is not the residual instrument but the only operable one.

The third lesson qualifies the second. A warning that cannot be falsified also cannot be calibrated. If every plastic-packaged food carries the same notice regardless of polymer, process or measured content, the label conveys no comparative information and cannot reward a manufacturer who reduces shedding. The regulator's objection is therefore not frivolous, though the form in which it was advanced, that inconclusive science is a reason not to warn, is the very formulation precaution was developed to displace. Disclosure is a bridge to a measurement-based regime, not a substitute for one.

CHAPTER VI: ATTRIBUTION AND THE LIMITS OF POLLUTER PAYS

Indian environmental liability doctrine was built around the identifiable enterprise. The absolute liability rule was formulated for an undertaking engaged in a hazardous activity whose identity was never in question.³⁶ The remediation jurisprudence of the Bichhri litigation proceeded on the footing that the cost of restoring a despoiled area could be recovered from the industries that despoiled it.³⁷ Environmental compensation as administered by the Tribunal follows the same logic. Each depends on a defendant whose activity can be causally connected to the harm.

Microplastic releases from tyres, synthetic textiles and weathering products defeat that logic in three distinct ways. The emitting act is lawful use by a consumer rather than the operation of an industry. The emission is continuous and dispersed rather than an identifiable event capable of being pleaded. And the particle carries no signature usable in litigation, since polymer identification establishes the material class but never the manufacturer.

Extended producer responsibility cannot absorb the difficulty, for the reason given in Chapter III. A tyre producer subjected to an obligation modelled on the packaging regime could discharge it entirely by collecting worn tyres at end of life while doing nothing about abrasion during use. Mass-balance responsibility and emission responsibility are different obligations,

³⁶*M C Mehta v Union of India* (1987) 1 SCC 395, paras 31 to 32.

³⁷*Indian Council for Enviro-Legal Action v Union of India* (1996) 3 SCC 212, paras 65 to 67.

and satisfying the first does not advance the second.

The appropriate response is to shift the regulatory question from liability to specification. Instead of asking who should pay for particles already released, the law should ask what propensity to shed a product may lawfully possess when placed on the market, and verify compliance at certification or type-approval. Indian law already does something structurally identical: the minimum thickness prescribed for carry bags regulates a physical property for an environmental purpose, enforced at manufacture rather than through later litigation. An abrasion limit for tyres or a fibre-retention requirement for washing machines is the same move applied to a different property, converting an insoluble evidentiary problem into a tractable conformity-assessment one.

CHAPTER VII: THE EUROPEAN UNION AND THREE UNUSED GRAMMARS

The comparative value of European practice lies less in any particular threshold than in the demonstration that microplastics have been regulated there through three distinct legal grammars, only one of which has any Indian counterpart.

7.1 Chemical restriction

Commission Regulation (EU) 2023/2055, in force from 17 October 2023, inserted entry 78 in Annex XVII to the REACH Regulation. The regulated object is the synthetic polymer microparticle, defined functionally rather than merely dimensionally: solid carbon-containing polymer particles, at least one per cent by weight of which either have all dimensions not exceeding five millimetres or are fibre-like with a length not exceeding fifteen millimetres and an aspect ratio above three. Polymers soluble above two grams per litre, those whose biodegradability has been validated by prescribed testing, unmodified natural polymers and polymers containing no carbon are excluded. The restriction bites on placing on the market, whether alone or where the particles confer a sought-after characteristic in a mixture at 0.01 per cent by weight or more.³⁸ Microbeads and loose glitter were prohibited immediately; rinse-off cosmetics other than exfoliating products follow in October 2027; detergents, fertilising products and other agricultural uses in October 2028; and colour cosmetics as late as October 2035, with labelling in the interim. Information duties commenced in October 2025 and

³⁸Commission Regulation (EU) 2023/2055 (n 10), entry 78, paras 1 and 2.

reporting obligations phase in from 2026.³⁹

Three contrasts with India follow. The European definition is functional and deliberately generous on size, whereas India's is purely dimensional and capped at one millimetre. The European restriction operates on market placement with a concentration trigger and therefore applies across sectors, whereas India's microbead prohibition operates through a product-standard list confined to cosmetics. Most importantly, the European measure couples restriction with labelling and reporting, so that the regulator precisely acquires the dataset its own review clause will require. India's prohibition generates nothing.

7.2 Operational duty

Regulation (EU) 2025/2365 on preventing plastic pellet losses, published in November 2025, addresses that after paints and tyres, the third largest source of unintentional release of microplastic. It applies to operators handling pellets above a modest annual threshold, to facilities cleaning pellet containers and to maritime carriers, requiring risk-management plans covering packaging, handling, equipment, staff and training, with obligations to clean up after accidental loss.⁴⁰

This is the grammar closest to existing Indian practice, because it resembles nothing so much as a consent condition. It requires no ambient standard and no analytical method, regulating conduct rather than concentration. There is no legal obstacle to India replicating it immediately, whether by rules under section 3 of the Environment (Protection) Act or by standard conditions in consents granted to polymer producers, converters and port facilities under the Water Act.

7.3 Type-approval

The Euro 7 Regulation created the legal basis for binding abrasion limits on tyres placed on the European market, with the test methods being settled through the United Nations vehicle regulations forum and limits sequenced by vehicle class.⁴¹ France has separately required new

³⁹ibid, entry 78, para 6 (transitional periods) and paras 7 to 9 (information and reporting duties).

⁴⁰Regulation (EU) 2025/2365 of the European Parliament and of the Council on preventing plastic pellet losses to reduce microplastic pollution, published in their Official Journal on 26th November 2025.

⁴¹Regulation (EU) 2024/1257 on type-approval requirements for motor vehicles with respect to emissions and battery durability (Euro 7); tyre abrasion test methods are under development at the UN World Forum for Harmonization of Vehicle Regulations (WP.29).

domestic and professional washing machines to incorporate microfibre filtration or an equivalent solution.⁴² Both operate at conformity assessment, before the product reaches the consumer, and neither depends on measuring particles in the environment.

7.4 Against transplantation

Three cautions are necessary. The chemical restriction presupposes a substance registration infrastructure India does not possess, and is enforced at market placement within a customs union with harmonised surveillance, whereas Indian enforcement runs through State Boards that the 2026 amendments have just burdened with further decentralised duties. Second, India's plastics economy includes a large informal recovery sector whose livelihood interests must be weighed as part of sustainable development as understood since Vellore and applied in the large project cases.⁴³ Third, the sequencing of European measures assumes analytical capacity that already existed; India cannot begin at the same point.

Nor can domestic reform be sequenced on the international negotiations. The resumed fifth session of the intergovernmental negotiating committee adjourned in Geneva in August 2025 without consensus; the chair resigned; and the session reconvened in February 2026 only to elect a successor, with substantive negotiation deferred.⁴⁴ A State that waits for that process will wait for years.

CHAPTER VIII: A SEQUENCED ARCHITECTURE FOR INDIA

The design principle following from the analysis may be stated in three phases: method before limit, conduct before concentration, design before liability. The steps below are ordered accordingly, each located within a power India already has.

First, notify a measurement method. The two international texts before the Water Quality Sectional Committee should be adopted as Indian Standards without further delay; a reference laboratory should be designated within the Central Pollution Control Board with two or three zonal laboratories; and a protocol prescribing sampling, size fractions, polymer identification

⁴²Loi No 2020-105 du 10 février 2020 relative à la lutte contre le gaspillage et à l'économie circulaire (AGEC), art 79, applicable to new washing machines placed on the market from 1 January 2025.

⁴³Narmada Bachao Andolan v Union of India (2000) 10 SCC 664.

⁴⁴United Nations Environment Programme, *Talks on global plastic pollution treaty adjourn without consensus* (Geneva, 15 August 2025) the third meeting of the fifth session (INC-5.3) convened in Geneva on 7 February 2026 and elected Ambassador Julio Cordano of Chile as Chair without substantive negotiation.

and reporting units for regulatory purposes should issue under the Board's statutory functions and the rule-making power of the Environment (Protection) Act.⁴⁵ Nothing else here is enforceable until this is done, and it would also release the stalled revision of the drinking water specification.

Second, consolidate the definition. The one micron to one thousand micron formulation should be replaced by a single definition applicable across the plastic waste rules, any future microplastic rules and the drinking water specification, extending from one micron to five millimetres, defining fibres by length and aspect ratio, and establishing a separate defined term for nanoplastics below one micron. The last is no longer optional, since a High Court has placed the expression on product labels.

Third, relocate the microbead prohibition. The restriction presently contained in the cosmetics standard should be re-enacted as a rule under sections 3 and 6 of the Environment (Protection) Act, so that breach attracts environmental compensation and adjudication, and should be extended beyond rinse-off cosmetics to detergents, abrasives and agricultural encapsulation, with dated transitions on the European model rather than an immediate blanket prohibition.

Fourth, impose operational duties where measurement is unnecessary. A pellet-handling duty modelled on the 2025 European regulation should be imposed on polymer producers, compounders, converters, transporters and port facilities as a standard consent condition, coupled with a clean-up obligation and a simple annual return. This is the fastest available gain in the entire scheme and requires no new analytical capability whatever.

Fifth, use product standards for use-phase shedding. Tyre abrasion should be brought within type-approval under the motor vehicle rules once the international test method is settled, rather than by legislating a limit in advance of a method. Fibre retention on new washing machines should come through a Bureau specification with a phased commencement date. Shedding propensity should first appear as a declared parameter under the existing eco-labelling scheme, so that the market generates comparative data before the State fixes a threshold.

⁴⁵Water (Prevention and Control of Pollution) Act 1974, § 16(2); Environment (Protection) Act 1986, § 3(2)(iv) and § 6(2)(b).

Sixth, codify disclosure instead of litigating it. The direction issued by the Madras High Court should be converted into a regulation under the food safety legislation with a defined trigger, prescribed wording and a sunset clause tied to the adoption of a measurable standard. That would answer the regulator's proportionality objection, remove the uncertainty that successive challenges have generated, and preserve the protective effect that the Court and the Supreme Court have both endorsed.

Seventh, address coordination. Responsibility for microplastics is presently distributed across the environment ministry, the central and State pollution boards, two sectional committees of the Bureau of Indian Standards, the food safety authority, the drugs administration, the Jal Shakti ministry and its groundwater board, and the ministries for road transport and textiles. The Environment (Protection) Act already permits the Central Government to constitute authorities and entrust them with such powers as it considers necessary.⁴⁶ A standing inter-regulatory authority constituted under that provision, with a defined mandate over method, inventory and source instruments, is preferable to coordination by litigation.

Eighth, build the dataset. The Board and the Department of Drinking Water and Sanitation should be directed to generate and transmit the datasets the Bureau has requested, using the newly notified method, on a fixed reporting cycle and published. A national microplastic inventory is the precondition of any future numerical standard, of any defensible compensation formula, and of a credible Indian negotiating position when the international process resumes.

CHAPTER IX: CONCLUSION

The hypothesis is confirmed, and in a stronger form than originally framed. India's difficulty is not merely that its plastic law is waste-centred, although it is. The difficulty is that its pollution statutes are quantity-dependent while its regulatory apparatus is quantity-blind. The Environment (Protection) Act asks whether a substance is present in an injurious concentration; the Air Act asks the same; the Water Act asks a question that cannot in practice be answered without quantification. A regulator unable to produce a defensible concentration figure cannot bring microplastics within any of those definitions, and a court directing it to do so will be told, as the Tribunal was told in April 2026, that compliance is constrained.

⁴⁶Environment (Protection) Act 1986, § 3(3).

Three conclusions follow for reform. The measurement vacuum must be closed first, because it is anterior to everything else and because closing it is inexpensive, uncontroversial and within existing powers. Precaution must be redirected from the question it has been applied to, which is whether a numerical limit can be justified, to the question it should govern, which is whether protective measures proportionate to uncertainty should be taken in the meantime. And attribution should be abandoned as the organising concept for diffuse sources in favour of specification, because a propensity to shed can be tested at certification whereas a released particle cannot be traced to a defendant.

The Ganga file states the position more economically than any argument can. A tribunal ordered a measurement. The State replied that measurement was not, in law, possible. Until that reply ceases to be true, microplastics will remain a substance that Indian law is able to define, to describe and to deplore, but not to regulate.