

SENSORY OVERLOAD IN MODERN JURISPRUDENCE: INTEGRATING LIGHT TRESPASS AND ACOUSTIC DISTURBANCE INTO COMPARATIVE ENVIRONMENTAL PROTECTION FRAMEWORKS

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ABSTRACT

Environmental law has organised itself around media that are visible and chemically measurable: air, water, soil, and biological resource. Sound and artificial light have entered this framework only belatedly and unevenly, treated as marginal nuisance rather than as a coherent category of harm. This paper submits that acoustic disturbance and light trespass are twin manifestations of a single underlying wrong, the unbargained-for imposition of a sensory stimulus that a person cannot escape within their own home, and that no jurisdiction currently regulates them as such. Drawing on comparative material from India, the United Kingdom, the United States, and the European Union, the paper traces how constitutional doctrine, statutory nuisance law, common law balancing, and administrative planning have each extended protection to noise while leaving light trespass comparatively unregulated. It grounds this claim in a theory of sensory sovereignty over the domestic sphere, and closes by proposing an integrated sensory pollution framework built on definitional parity between sound and light, zone-based cumulative standards, and a single specialised enforcement body, illustrated with a model statutory clause.

KEYWORDS: *Sensory Pollution; Light Trespass; Noise Pollution; Article 21; Comparative Environmental Law.*

1. INTRODUCTION

Environmental law has historically organised itself around media that are visible, measurable in mass, and traceable to a discharge point: air, water, soil, and biodiversity. Statute speak of effluent, emission and hazardous substance, and courts have built an elaborate jurisprudence of standing, causation and remedy around pollutant that can be sampled, weighed and chemically identified. Sensory intrusion, disturbance of the human perceptual field caused by excessive sound and misdirected artificial light, sit uneasily within this paradigm. They leave no residue, cause no visible contamination, and rarely kill outright, yet they degrade sleep architecture, elevate cardiovascular risk, disrupt circadian regulation, and displace nocturnal wildlife with a consistency public health and ecological literature now document extensively.¹ This paper submits that acoustic intrusion and light trespass are not distinct infrastructural side-effect but twin manifestation of a single, unbargained-for expropriation of

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¹ World Health Organization, Environmental Noise Guidelines for the European Region (2018); Travis Longcore & Catherine Rich, Ecological Light Pollution, 2 *Frontiers in Ecology & the Env't* 191 (2004).

bodily integrity within the home, a legal problem this paper terms sensory overload, and that treating them as disconnected nuisance rather than as a unified category of environmental harm has produced fragmented, reactive and under-enforced regulation across major jurisdiction.

India's Environment (Protection) Act, 1986 defines environmental pollutant broadly enough to include noise, and a 2000 amendment to the Environment (Protection) Rules formally recognised noise as a pollutant, yet the statute contains no equivalent acknowledgment of light.² The United Kingdom folds both concern into the residual category of statutory nuisance under the Environmental Protection Act 1990, having added artificial light only in 2005, fifteen year after noise was already covered by the parent statute.³ The United States has no federal light pollution statute at all, and its principal noise legislation, the Noise Control Act of 1972, survives mainly through the residual authority it left with municipality after federal enforcement funding was withdrawn in 1982.⁴ The European Union regulates noise through a mapping and action-planning directive that produces comparative data without prescribing enforceable exposure limit, and it has no light pollution directive whatsoever.⁵ This asymmetry is not incidental. It reflects an implicit judicial and legislative hierarchy in which acoustic disturbance, being older, more immediately felt, and easier to measure in decibel, has earned a place within nuisance and constitutional doctrine that light trespass has yet to secure.

This paper confines its comparative lens to four system chosen for doctrinal complementarity rather than geographic convenience. India offers the clearest constitutional route to sensory protection through Article 21's widening conception of the right to life; the United Kingdom offers the only mature statutory nuisance regime formally covering both noise and light within one provision; the United States offers the most developed common law nuisance reasoning applied to industrial sensory harm, together with the world's oldest municipal dark-sky ordinance and the standing doctrine that most sharply constrains it; and the European Union offers a supranational planning and data-generation model no single legislature could build alone. Reading these system together, rather than treating any one as exemplary, is what allows the deficiency examined in Section 7 to come into focus.

² Environment (Protection) Act, 1986, § 2(a), No. 29, Acts of Parliament, 1986 (India); Ministry of Env't, Forest & Climate Change, Notification, G.S.R. 71(E) (Feb. 2, 2000) (India).

³ Environmental Protection Act 1990, c. 43, § 79(1)(fb) (Eng.), as inserted by Clean Neighbourhoods and Environment Act 2005, c. 16, § 102.

⁴ Noise Control Act of 1972, Pub. L. No. 92-574, 86 Stat. 1234 (codified as amended at 42 U.S.C. §§ 4901-4918); 47 Fed. Reg. 22,235 (May 21, 1982).

⁵ Council Directive 2002/49/EC, 2002 O.J. (L 189) 12 (EC).

The argument advanced here proceeds in four stage. It first develops a conceptual account of sensory overload as a distinct category of environmental harm, grounding it in a theory of sensory sovereignty over the domestic sphere that draws on property, personhood, and public-trust reasoning. It then examines, comparatively, how India, the United Kingdom, the United States, and the European Union regulate acoustic disturbance and light trespass, using landmark judicial decision to test how far constitutional and tort doctrine have travelled toward recognising sensory rights. It next identifies the structural deficiency common to all four system. Finally, it proposes an integrated regulatory framework that treats sensory pollution as a single statutory category, illustrated with a model statutory clause that legislatures could adapt directly.

2. THE DOCTRINAL ARCHITECTURE OF SENSORY OVERLOAD

Sensory overload, for the purpose of this analysis, denotes the involuntary and sustained exposure of a person to a stimulus, whether auditory or photic, that exceeds the threshold at which the human nervous system can adapt without physiological or psychological cost. The concept draws support from three converging body of knowledge: environmental science, public health, and property doctrine.

From the standpoint of environmental science, both noise and light are form of energy that propagate beyond the boundary of the activity generating them and intrude upon a third party's enjoyment of space without any transfer of matter, a distinction from conventional pollutant that explains why both were absorbed into environmental law only belatedly, through amendment rather than original design. Noise is measured in decibel on a logarithmic scale, and light trespass is measured in lux or footcandle at the property boundary, yet both share the defining trait of being present only while the source is active and vanishing without physical trace once it is switched off.⁶ This transience is often mistaken for triviality, though the World Health Organization attributes upward of one million healthy life-years lost annually in Western Europe to traffic noise alone, chiefly through sleep disturbance and ischaemic heart disease.⁷ Parallel research links artificial light at night to melatonin suppression and elevated risk of metabolic disorder, mechanism clarified by the photobiological research recognised in the 2017 Nobel Prize in Physiology or Medicine for elucidating the molecular control of circadian rhythm, in addition

⁶ British Standards Institution, Guidance on the Limitation of the Effects of Obtrusive Light, BS 5489-1.

⁷ World Health Organization, *supra* note 1, at 14-16.

to well-documented harm to migratory bird, sea turtle hatchling, and nocturnal pollinator whose behaviour depends on natural light cue.⁸

From the standpoint of public health, both form of sensory intrusion operate through the same causal pathway: interference with sleep. The right to sleep has itself become a distinct constitutional value in Indian jurisprudence, most visibly in the Supreme Court's *suo motu* intervention following the forcible dispersal of a sleeping crowd of protesters at Ramlila Maidan, where the Court held that Article 21 protects the right to sleep peacefully as an inseparable incident of the right to life.⁹ The logic of that decision, that sleep is not a peripheral comfort but a biological precondition for the exercise of every other right, applies with equal force whether the interference is a police baton charge, a loudspeaker operating past midnight, or a floodlit car park shining directly into a bedroom window. Judges have been comfortable extending this reasoning to noise; they have not yet been asked, in India, to extend it explicitly to light, and this paper argues that the underlying constitutional logic permits no principled distinction between the two.

This physiological premise supports a normative claim beyond doctrine: sensory intrusion into the home implicates sensory sovereignty, an individual's interest in bodily and spatial control over a perceptual environment tied to personal identity.¹⁰ Radin's account of property and personhood explains why the home commands heightened protection, since it is constitutive of selfhood rather than a fungible asset, and Sax's public trust doctrine supplies the collective dimension, treating diffuse sky glow and an ambient noise floor as degradation of an acoustic and photic commons rather than injury to a single plot of land.¹¹ Together these justify sensory overload as an independent interest, not a derivative of noise- or light-specific statute.

From the standpoint of property and tort doctrine, the case for treating noise and light identically is stronger still. Anglo-American nuisance law has never required physical invasion by a solid object; it has always accepted that intangible intrusion, smoke, vibration, odour, and sound, can constitute an actionable interference with the use and enjoyment of land, provided the interference is substantial and unreasonable in the circumstance of the locality.¹² Once that threshold is accepted for sound wave, there is no coherent doctrinal reason to withhold it from photon. Both are form of energy crossing a

⁸ Richard G. Stevens et al., Meeting Report: The Role of Environmental Lighting and Circadian Disruption in Cancer and Other Diseases, 115 *Envtl. Health Persp.* 1357 (2007).

⁹ In re: Ramlila Maidan Incident, (2012) 5 S.C.C. 1, 60-62 (India).

¹⁰ Margaret Jane Radin, Property and Personhood, 34 *Stan. L. Rev.* 957 (1982).

¹¹ Joseph L. Sax, The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention, 68 *Mich. L. Rev.* 471 (1970).

¹² William L. Prosser, *Handbook of the Law of Torts* § 89, at 591-92 (4th ed. 1971).

property boundary without the source's foot ever touching the claimant's soil, and both are actionable in nuisance on functionally identical reasoning, a point English local authority guidance now recognises explicitly by classifying nuisance lighting alongside nuisance noise within the same statutory provision.¹³ The persistence of separate statutory pathways for the two, noise first, light only by later amendment, is therefore a matter of legislative sequencing and political salience rather than any principled conceptual boundary.

The precautionary reasoning Indian courts have applied to conventional pollution supplies a further, underused argument for treating sensory harm as environmental harm proper. In *Vellore Citizens' Welfare Forum v. Union of India*¹⁴, the Supreme Court read the precautionary principle and the polluter-pays principle into Article 21 and into the general scheme of the Environment (Protection) Act, 1986, holding that the absence of complete scientific certainty about the extent of harm does not excuse a regulator from acting where credible evidence of injury exists. The epidemiological literature on noise-induced cardiovascular strain and on circadian disruption from artificial light at night already clears that threshold; what is missing is not evidence but the institutional will to apply the same precautionary posture Indian courts readily apply to tannery effluent or industrial emission to the sensory pollutant examined in this paper.

3. ACOUSTIC DISTURBANCE IN COMPARATIVE LEGAL SYSTEMS

India regulates noise through the Noise Pollution (Regulation and Control) Rules, 2000, framed under the Environment (Protection) Act, 1986, which prescribe ambient noise standard for industrial, commercial, residential, and silence zones, and which restrict the use of loudspeaker between ten at night and six in the morning save for a narrow, State-administered exemption.¹⁵ These Rules did not emerge from legislative initiative but from sustained judicial pressure. In *Church of God (Full Gospel) in India v. K.K.R. Majestic Colony Welfare Association*¹⁶, the Supreme Court rejected the argument that religious freedom under Article 25 permitted a church to disturb its neighbours with amplified prayer, holding that no religion mandates the use of loudspeaker and that the right to freedom of religion does not extend to imposing noise upon an unwilling audience. Five year later, in the omnibus proceeding titled *Noise Pollution (V), In re*¹⁷, the Court went further and held that freedom from noise

¹³ West Lindsey Dist. Council, Statutory Nuisance: Lighting (Eng.).

¹⁴ *Vellore Citizens' Welfare Forum v. Union of India*, (1996) 5 S.C.C. 647 (India).

¹⁵ Noise Pollution (Regulation and Control) Rules, 2000, G.S.R. 682(E), sched. (India).

¹⁶ *Church of God (Full Gospel) in India v. K.K.R. Majestic Colony Welfare Ass'n*, (2000) 7 S.C.C. 282 (India).

¹⁷ *Noise Pollution (V), In re*, (2005) 5 S.C.C. 733 (India).

pollution is itself an inseparable element of the right to life under Article 21, fixed a ten decibel ceiling above ambient standard, prohibited horn at night in residential area, and directed every State to implement the 2000 Rules through specific enforcement machinery. The National Green Tribunal has since treated these direction as binding under Articles 141 and 142 until modified by the Supreme Court or superseded by legislation, reaffirming them in subsequent enforcement litigation.¹⁸ The doctrinal architecture is therefore unusually mature: a constitutional right, a subordinate regulatory framework, and a specialised tribunal for enforcement all point in the same direction, yet enforcement on the ground, particularly during religious festival and election campaign, remains inconsistent, a gap this paper returns to in Section 7.

The reasoning in *Church of God* supplies the analytical template this paper extends to light. The Court did not ask whether the amplified prayer was religiously significant; it asked whether the interference imposed on unwilling neighbours was proportionate to any legitimate purpose it served, and found the balance against the disturbance once credible evidence of harm to sleep and health was shown. That proportionality inquiry is source-neutral: it does not depend on the intrusion being auditory, and a floodlit hoarding or unshielded security light interfering with a neighbour's sleep on the same term would fail the identical test.

The United Kingdom takes a markedly different route, situating noise within the general law of statutory nuisance under Part III of the Environmental Protection Act 1990, which empowers local authority to serve an abatement notice wherever noise emitted from premises is prejudicial to health or a nuisance, with criminal liability attaching to non-compliance.¹⁹ This approach dispenses with rigid decibel threshold in favour of a contextual standard resembling the common law reasonableness test, giving local environmental health officer considerable discretion but also producing inconsistency in enforcement standard across council. The civil law of private nuisance operates alongside this statutory scheme, permitting an aggrieved landowner to sue directly for an injunction or damage without waiting for local authority action.

The United States relies principally on state and municipal ordinance rather than a coherent federal scheme. The Noise Control Act of 1972 created a federal Office of Noise Abatement and Control within the Environmental Protection Agency, but Congress defunded that office in 1982 as part of a broader deregulatory turn, leaving the statute formally on the book while transferring practical responsibility to state and local government and to the tort

¹⁸ Nat'l Green Tribunal, *Prem Kumar Dixit v. State of M.P. (India)* (directing compliance with Noise Pollution (V), In re, (2005) 5 S.C.C. 733, and *Balwant Singh v. Comm'r of Police*, (2015) 4 S.C.C. 801).

¹⁹ Environmental Protection Act 1990, c. 43, § 79(1)(g) (Eng.).

law of nuisance.²⁰ *Boomer v. Atlantic Cement Co.*²¹ remains the doctrinal touchstone for how American courts weigh a proven nuisance, there vibration, dust, and noise from a cement plant, against the economic cost of an injunction, and the New York Court of Appeals' decision to award permanent damage in lieu of closing the plant illustrates a recurring feature of common law response to sensory pollution: courts are willing to acknowledge the harm but reluctant to grant equitable relief that imposes a disproportionate economic cost on the source. That reluctance has considerable relevance for light trespass litigation, discussed in Section 4, because it predicts how American courts are likely to treat photic nuisance claims once they are litigated with comparable rigour.

The European Union regulates noise chiefly through Directive 2002/49/EC, the Environmental Noise Directive, which obliges member state to prepare strategic noise map for major agglomeration, road, railway, and airport and to adopt action plan addressing the result, but which conspicuously stops short of prescribing binding exposure limit, leaving substantive standard-setting to national law.²² The Directive is therefore best understood as a transparency and planning instrument rather than a command-and-control regime, and its five-yearly reporting cycle has generated an unusually rich comparative dataset on noise exposure across Europe without correspondingly reducing exposure, a disjunction the European Commission's own implementation reports have acknowledged.²³

4. LIGHT TRESPASS AND PHOTIC POLLUTION

Light trespass, the intrusion of artificial light beyond the boundary of the property from which it originates and onto neighbouring land where it is unwanted, has followed a strikingly different regulatory trajectory from noise, despite sharing its essential legal structure. The earliest and still most instructive regulatory response originated not from a national legislature but from a single municipality. Flagstaff, Arizona enacted the world's first outdoor lighting ordinance in 1958 to protect the Lowell Observatory's astronomical operation from encroaching searchlight, refined its lighting code in 1972 to require shielded, downward-facing fixture, and by 1989 had developed spectral and lumen-per-acre standard that remain a model referenced by dark-sky advocacy body internationally.²⁴ Flagstaff's ordinance matters less for its content than for what it reveals about the field's origin: it arose from a narrow, technical interest in astronomical seeing condition, not a generalised right to

²⁰ Noise Control Act of 1972, *supra* note 6; 47 Fed. Reg. 22,235, *supra* note 6.

²¹ *Boomer v. Atl. Cement Co.*, 26 N.Y.2d 219, 257 N.E.2d 870 (1970).

²² Council Directive 2002/49/EC, arts. 7-8, 2002 O.J. (L 189) 12, 18-20 (EC).

²³ European Commission, Report on the Implementation of the Environmental Noise Directive, COM(2017) 151 final (Mar. 30, 2017).

²⁴ City of Flagstaff, Dark Sky History in Flagstaff (2024).

darkness, and this origin has shaped light pollution regulation toward astronomy and ecology rather than residential amenity or public health.²⁵

The United Kingdom is the only major common law jurisdiction to have brought light squarely within general environmental nuisance law. Section 102 of the Clean Neighbourhoods and Environment Act 2005 amended section 79 of the Environmental Protection Act 1990 to add artificial light emitted from premises so as to be prejudicial to health or a nuisance to the statutory list of nuisance, with effect from April 2006.²⁶ The amendment exempts light from airport, harbour, railway, bus and goods vehicle operating centre, prison, defence premises, and lighthouse, and it leaves floodlit sports facility subject only to a best practicable means defence.²⁷ This is not a minor drafting choice: the carve-out insulates the two largest commercial source of night-time glare, stadium lighting and transport infrastructure, so that protection tracks the emitter's economic weight rather than the severity of the intrusion, the inverse of the proportionality logic *Church of God* applied to noise. Even within its remaining scope, the English approach reveals a conceptual limitation worth emphasising: local authority guidance distinguishes between light spilling directly onto a complainant's property, which is actionable, and light visible only as a distant glow or as a contributor to regional sky brightening, which is not, because a street cannot be classified as premises and diffuse sky glow cannot be attributed to a single identifiable source.²⁸ This distinction excludes precisely the aggregate, cumulative harm that most troubles astronomer and ecologist, namely the collective sky glow produced by thousands of individually lawful light source.

India has no dedicated light pollution statute, and the gap is not merely theoretical. Successive coastal regulation notification have flagged artificial lighting near nesting beach as a documented threat to Olive Ridley turtle hatchling, whose seaward orientation depends on distinguishing the brighter horizon over open water from artificial glow inland, yet this concern has been addressed through isolated coastal zone condition rather than any general statute analogous to the Noise Pollution Rules.²⁹ The Environment (Protection) Act, 1986 is drafted broadly enough, defining environmental pollutant as any substance present in concentration injurious to environment, that a delegated rule extending it to light would face no obvious constitutional obstacle; the absence of such a rule reflects a failure of regulatory imagination rather than

²⁵ Flagstaff Dark Skies Coalition, Outdoor Lighting Codes.

²⁶ Clean Neighbourhoods and Environment Act 2005, c. 16, § 102, amending Environmental Protection Act 1990, c. 43, § 79 (Eng.).

²⁷ Id. § 102(3)-(6).

²⁸ Milton Keynes Council, Light Pollution: Is It a Statutory Nuisance? (Eng.).

²⁹ Ministry of Env't, Forest & Climate Change, Coastal Regulation Zone Notification, S.O. 19(E) (Jan. 6, 2011) (India).

statutory constraint. Article 21's protection of the right to sleep, as articulated in *Ramlila Maidan*, rests on the premise that uninterrupted sleep is a biological necessity, and floodlit signage, unshielded security lighting, and continuously illuminated construction site interfere with that process, suppressing melatonin and preventing restorative sleep, as effectively as an amplified loudspeaker. No principled reading of Article 21 confines its protection to auditory interference alone.

The United States again presents a fragmented picture. No federal light pollution statute exists, and the International Dark-Sky Association's model lighting ordinance, though adopted in some form by hundreds of municipality and several state including Arizona, operates purely as persuasive model legislation with no binding federal or interstate effect.³⁰ Litigation over light trespass in the United States has therefore proceeded almost entirely through state nuisance law, applying the same balancing methodology *Boomer v. Atlantic Cement Co.* established for industrial noise and dust: a plaintiff must prove substantial interference and then persuade a court that the equities favour an injunction rather than damage, a hurdle historically difficult to clear where the light source serves a recognised commercial or security purpose.

The evidentiary asymmetry between the two forms of pollution is narrowing in ways the law has not yet absorbed. Ground-based decibel meter have long allowed noise regulators to generate precise, court-admissible measurement at a specific boundary and a specific time, and the Indian Noise Rules are drafted around exactly this capability. Satellite-based radiometry now performs a comparable function for light: NASA and NOAA's VIIRS instrument produces annually updated, sub-kilometre night-time radiance data for every municipality on earth, and low-cost networked acoustic sensor offer a comparable area-wide capability for sound.³¹ No jurisdiction surveyed has built either into its statutory evidentiary framework, so regulation remains tied to the complaint-driven, single-source model even though cumulative, area-wide enforcement is now, if anything, easier than ground-based monitoring. Administrative impracticability, the standard justification for leaving cumulative sensory exposure outside statutory pollutant definition, is accordingly no longer a defensible basis for legislative inaction.

5. JUDICIAL CONSTRUCTION OF SENSORY RIGHTS

Reading the case law of these jurisdiction together yields a consistent pattern: courts extend protection to sensory interest readily when the harm can be tied to an established constitutional or proprietary right, and hesitate when the harm

³⁰ International Dark-Sky Association, Model Lighting Ordinance (2011).

³¹ Miguel O. Román et al., NASA's Black Marble Nighttime Lights Product Suite, 210 Remote Sensing of Env't 113 (2018).

must be recognised as a freestanding category. The Indian Supreme Court's noise jurisprudence illustrates the first path. In *Noise Pollution (V)*, *In re*, the Court did not invent a new right; it located freedom from noise within the pre-existing, capacious right to life under Article 21, a technique the Indian judiciary has used repeatedly to environmentalise the Constitution without constitutional amendment. The same technique, once deployed for sleep in *Ramlila Maidan*, is doctrinally available for light, yet no reported Indian decision has squarely presented the question of a floodlit billboard or an unshielded security light as an Article 21 violation, an absence this paper attributes to the lower salience and lower measurability of light trespass rather than to any doctrinal barrier.

English courts, by contrast, have approached both noise and light through the narrower lens of statutory nuisance and private nuisance, a body of doctrine that asks whether the interference is substantial and unreasonable given the character of the locality, rather than whether a constitutional right is engaged. This produces more technically precise outcome, since a magistrates' court applying the statutory nuisance regime can require expert evidence of prejudice to health or of the extent of light spill, but it also produces a narrower remedy, generally an abatement notice rather than a declaration of right, and it leaves the diffuse, cumulative harm of sky glow structurally unaddressed for the reasons already given in Section 4.

This gap is sharper against American standing doctrine. Where Indian courts let citizen and the National Green Tribunal act suo motu on diffuse harm, *Lujan v. Defenders of Wildlife*³² requires a concrete, particularised injury rather than a generalised grievance shared by the public. Cumulative sky glow and an ambient noise floor are, almost by definition, generalised: no single resident can show that one fixture, rather than the aggregate of thousand, caused a measurable injury. *Lujan's* individuation requirement does for American litigation what the single identifiable source rule does for English nuisance law, it forecloses the cumulative claims that most need a remedy, and explains why American light law has developed only where a municipality legislates proactively, as Flagstaff did, rather than through courts.

American courts occupy an intermediate position. *Boomer v. Atlantic Cement Co.* shows a willingness to find nuisance liability even for large-scale industrial noise and vibration, but the same decision's refusal to grant an injunction, opting instead for permanent damage calculated against the cost of closing a valuable plant, demonstrates the economic balancing that pervades American nuisance doctrine and that tends to disadvantage claimant whose injury, however real, is difficult to monetise precisely, a category into which both chronic sleep disturbance and low-grade circadian disruption from ambient

³² *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1992).

light fall. The absence of a constitutional dimension to this reasoning, since the United States Constitution contains no analogue to Article 21's right-to-life doctrine as developed in India, means American plaintiffs cannot invoke the sleep-as-biological-necessity reasoning the Indian Supreme Court used in *Ramlila Maidan*, and must instead rely entirely on the comparatively weaker vocabulary of property interference.

The European Union's Environmental Noise Directive occupies yet another position, avoiding individual rights litigation altogether in favour of administrative planning obligation enforceable, if at all, through infringement proceeding brought by the Commission against a defaulting member state rather than through private claim brought by an affected resident.³³ This model produces excellent comparative data, member state must report noise exposure figure on a standard schedule, but it creates no individual entitlement a person disturbed by aircraft noise or urban traffic can invoke directly, and it has no equivalent whatsoever for light. The four jurisdiction therefore illustrate four distinct strategy, constitutional incorporation in India, statutory nuisance codification in the United Kingdom, private nuisance balancing tightened by standing doctrine in the United States, and administrative planning in the European Union, and no single jurisdiction combines the strength of all four.

6. INSTITUTIONAL AND REGULATORY DESIGN

The comparative survey in Sections 3 through 5 exposes a second axis of divergence: institutional design, or which body actually enforces sensory protection and with what tools. India's National Green Tribunal, established under the National Green Tribunal Act, 2010, offers the most specialised forum among the four system, possessing civil jurisdiction over environmental dispute and the power to award compensation, and it has repeatedly directed state government to comply with the Supreme Court's noise mandate.³⁴ Yet the Tribunal's jurisdiction is tied to specific scheduled enactment, and because none designates light pollution as an environmental matter, its technical expertise, suo motu power, and faster timeline remain unavailable for light trespass claim, which must proceed through the slower, more generalist route of writ jurisdiction or ordinary civil suit.

The United Kingdom's institutional model disperses enforcement to local authority environmental health department, which investigate both noise and light complaint under the same statutory framework and can apply a genuinely integrated methodology at the point of first complaint, an advantage neither India nor the United States replicates. Its weakness lies in dependence on scarce

³³ Council Directive 2002/49/EC, art. 11, 2002 O.J. (L 189) 12, 22 (EC).

³⁴ National Green Tribunal Act, 2010, § 14 and sched. I, No. 19, Acts of Parliament, 2010 (India).

local authority resource and complaint-driven investigation, which under-detects harm affecting people too transient, vulnerable, or unaware of their right to complain.

The United States exhibits the least institutional coherence of the four system, having let federal noise enforcement capacity atrophy after 1982 and never built federal light pollution capacity at all, so that enforcement quality varies enormously by municipality, well-resourced dark-sky community such as Flagstaff maintain rigorous permitting regime while most jurisdiction have no light ordinance and rely on generalist nuisance litigation that is slow, expensive, and, after *Lujan*, uncertain even to reach the merit. The European Union's institutional strength lies precisely where its substantive strength lies, in data generation, since the European Environment Agency's ReportNet system aggregates strategic noise map from every member state into a single comparative resource, but this institutional capacity has not been extended to light pollution, and enforcement of even the noise-mapping obligation depends on the Commission's willingness to pursue infringement proceeding, a discretionary and politically constrained mechanism.³⁵

This institutional divergence has a distributive dimension environmental justice scholarship has not yet fully absorbed into the sensory-pollution literature. Where enforcement depends on a specialised tribunal with suo motu power, as in India's noise regime, protection extends in principle even to community too poor or too disorganised to litigate, since the Tribunal can act without awaiting an individual complainant. Where enforcement depends on complaint-driven investigation or private litigation, as in the United Kingdom and the United States, protection tracks the complainant's resource and legal knowledge, disadvantaging tenant, migrant worker, and resident of informal settlement, who are disproportionately exposed to both traffic noise and unshielded commercial lighting, and least likely to have the standing or evidence *Lujan* effectively demands. An integrated sensory pollution framework relying on ambient zone standard rather than individual complaint, the model this paper develops in Section 7, would correct this distributive skew by making enforcement independent of any single resident's capacity to complain.

7. STRUCTURAL DEFICIENCIES AND THE CASE FOR INTEGRATION

Four deficiency recur across every jurisdiction surveyed. The first is definitional exclusion: apart from the United Kingdom's 2005 amendment, environmental statute were drafted with visible, chemically definable pollutant in mind, and light was added, where at all, as an afterthought, which explains

³⁵ European Environment Agency, ReportNet: Noise Data Repository.

why India's foundational statute still lacks any provision for light nineteen year after noise was fully operationalised through binding Supreme Court direction. The second is the cumulative harm problem from Section 4: nuisance regime require a discrete, identifiable source, a requirement *Lujan* reinforces by demanding particularised injury, and this excludes the aggregate sky glow and noise floor produced by thousands of lawful source, even though exposure-response data show ambient, low-level chronic exposure produces measurable population harm independent of any single contribution. The third is the enforcement gap between festival, religious, and commercial exemption and the underlying right, visible in India, where the Noise Rules permit night-time relaxation for religious occasion notwithstanding the Court's own finding that freedom from noise pollution is a facet of the right to life.³⁶ The fourth is the absence of any jurisdiction treating noise and light as a single category despite their identical structure as intangible, boundary-crossing, source-terminating intrusion upon property and person.

A further difficulty deserves separate mention because it explains why courts, even when sympathetic, have struggled to fashion remedy for sensory pollution that match the remedy available for conventional pollution. An injunction against a factory discharging effluent restores the river to something close to its prior state once compliance is achieved; the underlying resource, once cleaned, stays clean until the next discharge. Sensory pollution offers no equivalent baseline to restore to, because the harm exists only for as long as the source operates and disappears the instant it is switched off, which means courts framing remedy in the conventional injunctive mould, cease the activity, restore the status quo, are applying a remedial logic built for stock pollutant to a flow pollutant that behaves nothing like effluent or particulate matter. This is compounded by a choice courts rarely make explicit: on Calabresi and Melamed's classic distinction, damage protect an entitlement with a liability rule, letting the emitter continue so long as it pays, while an injunction protects it with a property rule, permitting continuation only with consent.³⁷ *Boomer's* permanent damage are a liability-rule outcome dressed as compromise: in practice they let a commercial emitter purchase, at a court-set price, a private easement over its neighbours' sensory environment. Zone-based ambient standard avoid this quiet transfer by fixing a property-rule ceiling ex ante that no lawful combination of source may exceed, rather than letting each defendant buy past an injunction.

An integrated regime invites an obvious objection: does regulating ordinary lighting as a pollutant risk administrative overreach into activity that is, in most

³⁶ Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, r. 5(3), G.S.R. 15(E) (India).

³⁷ Guido Calabresi & A. Douglas Melamed, Property Rules, Liability Rules, and Inalienability: One View of the Cathedral, 85 Harv. L. Rev. 1089 (1972).

case, harmless? The concern answers itself once the standard is specified. Zone-based lux and decibel ceiling, calibrated to the Noise Rules' existing four-category classification, regulate cumulative boundary exposure, not individual fixture; a porch light or shutter alarm poses no compliance risk because it does not, alone or with immediate neighbour, approach a residential zone ceiling. The burden falls, as under the Noise Rules today, on commercial and industrial operator whose aggregate output is large enough to matter, precisely the population the model clause below target.

An integrated framework would address each deficiency directly. Definitional exclusion can be resolved by amending environmental pollutant in framework statute, following India's own precedent of extending the Environment (Protection) Act, 1986 to noise by delegated rule, to include artificial light exceeding prescribed lux threshold at a property boundary. The cumulative harm problem requires a shift from source-based liability to zone-based standard, extending the Noise Rules' four-category classification to prescribe maximum ambient lux alongside maximum ambient decibel, a shift VIIRS and networked acoustic sensor, discussed in Section 4, now make administratively feasible. The enforcement gap can be narrowed by requiring any exemption to satisfy the same proportionality standard the Supreme Court applies to fundamental right, not the more permissive standard subordinate legislation now receives. Finally, treating noise and light as a single statutory category, with a shared institutional home possessing the National Green Tribunal's technical capacity and suo motu power, would let one set of zone standard and one body of enforcement jurisprudence develop coherently. The clause below shows how compactly this can be drafted.

Model Sensory Abatement Clause (illustrative draft for insertion into a framework environmental statute)

- Definition. Sensory pollutant means any anthropogenic acoustic emission exceeding prescribed decibel, dB(A), threshold, or any artificial photic intrusion exceeding prescribed lux threshold, measured at the boundary of an affected property.
- Zoning. Four ambient sensory zones, silence and dark, residential, commercial, and industrial, each carrying concurrent maximum decibel and lux ceiling for daytime and night-time hours.
- Presumption. Continuous exposure exceeding the applicable zone ceiling between 22:00 and 06:00 raises a rebuttable presumption of injury to the right to health and to quiet enjoyment of property, shifting the burden to the source to justify the exposure or bring it within limits.

- Enforcement. Jurisdiction vested in the same specialised tribunal proposed for noise, empowered to act *suo motu* on remote-sensing or sensor-network evidence without awaiting an individual complaint.

8. CONCLUSION

The comparative evidence assembled in this paper supports a single, direct conclusion: acoustic disturbance and light trespass are not merely analogous, they are two manifestation of the same underlying legal wrong, the involuntary imposition of a sensory stimulus that a person cannot escape within their own home or place of rest, and an intrusion upon the sensory sovereignty this paper has grounded in personhood and public-trust reasoning. Every jurisdiction examined here has, at some point, recognised this wrong for noise, whether through constitutional incorporation in India, statutory nuisance in the United Kingdom, common law balancing in the United States, or administrative planning in the European Union. None has yet extended the same recognition to light with comparable rigour, and the United Kingdom's 2005 amendment, though the most advanced model available, remains hedged by exemption that protect precisely the commercial actor, sports facility and transport infrastructure, most responsible for large-scale night-time glare.

Modern jurisprudence should therefore move toward an integrated sensory pollution framework built on three pillar: definitional parity between artificial light and excessive sound as co-equal environmental pollutant; zone-based, cumulative standard-setting capable of addressing diffuse sky glow and ambient noise floor rather than only single-source nuisance; and institutional consolidation of enforcement within one specialised tribunal with *suo motu* jurisdiction and technical expertise. The model clause proposed in Section 7 shows that this reform requires no wholesale reinvention, only the political will to extend an architecture India has already built for noise.

That political will matters most for resident least able to compel it. A regime built on individual complaint and private litigation, however sophisticated, protects those with the resource and legal knowledge to invoke it, while leaving shift worker, tenant, and resident of informal settlement, disproportionately exposed to both ambient noise and unshielded commercial lighting, without recourse. Zone-based standard enforced *suo motu* by a specialised tribunal correct that skew structurally rather than aspirationally. Until legislature make that choice, courts will continue to protect citizen from noise while leaving them, quite arbitrarily, exposed to light, a distinction neither physiology nor principle can defend.