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ENVIRONMENTAL JUSTICE WITHOUT DATA: HOW THE ABSENCE OF DISAGGREGATED ENVIRONMENTAL DATA HARMS MARGINALISED COMMUNITIES IN INDIA

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Abstract

Environmental harm in India is rarely experienced uniformly. Marginalised communities defined by caste, income, occupation, or settlement type bear disproportionate environmental risks, from air and water pollution to industrial hazards and climate impacts. Yet, environmental governance largely relies on aggregate data, which masks these inequalities and renders vulnerable populations statistically invisible. Environmental Impact Assessments, pollution monitoring systems, and judicial assessments often assume uniform exposure, leading to regulatory and remedial frameworks that fail to account for social differentiation. This article argues that the absence of disaggregated environmental data is not merely a technical oversight but a structural governance failure that perpetuates environmental injustice. Drawing on examples from urban air pollution, industrial waste, water contamination, and climate vulnerability, the paper examines how regulatory institutions and courts, including the National Green Tribunal, assess harm without recognising differential exposure. Finally, it proposes a framework for data justice, emphasising socially disaggregated monitoring, vulnerability-sensitive policy design, and judicial recognition of unequal environmental burdens. Aligning data collection with social realities is crucial to achieving environmental justice in India.

Keywords

Environmental justice, disaggregated data, marginalised communities, India, governance, NGT, environmental inequality, climate vulnerability

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I. Introduction: Environmental Harm Without Visibility

Environmental harm in India is commonly articulated through aggregate indicators average air quality indices, national pollution loads, or regional climate vulnerability scores. Such representations create an illusion of uniform exposure and equal impact. In practice, environmental harm is profoundly uneven, structured by caste hierarchies, economic vulnerability, occupational risk, housing precarity, and spatial marginalisation. Those who contribute least to environmental degradation frequently bear its most severe consequences.

A central reason for this invisibility lies in the absence of disaggregated environmental data. Environmental governance in India overwhelmingly relies on spatially aggregated indicators that fail to capture differential exposure within the same geographic unit. Pollution data, Environmental Impact Assessments (EIAs), compliance reports, and even judicial fact-finding processes rarely distinguish between communities based on caste, income, occupation, or settlement type. This "data blindness" is not benign. It directly shapes regulatory priorities, judicial outcomes, and policy design.

The consequences are particularly stark for marginalised communities living near industrial corridors, waste disposal sites, polluted water bodies, and climate-vulnerable landscapes. Their exposure remains statistically unacknowledged even as they experience disproportionate health risks, livelihood loss, and erosion of dignity. Courts and tribunals, including the Supreme Court of India and the National Green Tribunal (NGT), often rely on such aggregated data, inadvertently legitimising an incomplete and unequal understanding of environmental harm.

This article argues that environmental injustice in India is sustained not only by weak enforcement or regulatory capture, but by the systematic failure to collect, analyse, and deploy disaggregated environmental data. By examining how this absence shapes governance, adjudication, and policy outcomes, the article situates data justice as a foundational requirement for environmental justice.

II. Disaggregated Environmental Data: Concept and Significance

Disaggregated environmental data refers to information on environmental exposure, harm, and risk that is broken down across relevant social, economic, and demographic categories. Unlike aggregate indicators such as city-wide air quality indices or district-level water quality reports disaggregated data captures how environmental harm is experienced differently by groups

located within the same geographic space. These categories may include caste, income, gender, age, occupation, disability, settlement type, or proximity to pollution sources.

In public health and development policy, the importance of disaggregated data is well established. Health outcomes are routinely analysed across socio-economic markers to identify vulnerable populations and design targeted interventions[1]. Environmental governance in India, however, has largely failed to adopt a comparable approach. Pollution monitoring systems and EIAs continue to assume that residents of a polluted area experience harm uniformly.

This assumption is empirically flawed. Exposure to environmental harm is mediated by housing quality, occupational patterns, time spent outdoors, access to clean water, and capacity to relocate or adapt. For instance, a city may meet average air quality standards while informal settlements located near highways or industrial clusters experience chronic overexposure[2]. Similarly, water quality assessments may certify a river stretch as compliant while downstream Dalit hamlets or fishing communities rely on contaminated sources for survival[3].

The absence of disaggregated data also undermines participatory processes. EIAs rely on baseline data that treats affected populations as homogeneous, while public hearings often record attendance without examining barriers such as language, literacy, caste exclusion, or gendered silencing[4]. As a result, environmental clearances are frequently granted on the basis of incomplete assessments, with marginalised groups bearing unacknowledged costs.

Crucially, data collection is not a neutral technical exercise. Decisions about what data is collected, how it is categorised, and whose experiences are measured are inherently political. The privileging of aggregate indicators reflects institutional preferences for administrative efficiency over substantive equality, forming a structural foundation for environmental injustice.

III. Invisible Victims: Differential Exposure and Social Vulnerability

A. Urban Air Pollution

Urban air pollution illustrates the masking effect of aggregate data. City-wide Air Quality Index (AQI) values conceal sharp intra-city disparities. Informal settlements are often located near highways, construction zones, landfills, and industrial clusters areas associated with higher

[1] World Health Organization, *Health Inequality Monitoring* (WHO 2013).
[2] Centre for Science and Environment, *Living in Gas Chambers* (CSE 2019).
[3] A Baviskar, *Uncivil City: Ecology, Equity and the Commons in Delhi* (OUP 2020).
[4] Ministry of Environment, Forest and Climate Change, *EIA Notification 2006* (as amended).

pollutant concentrations[5]. Residents of these settlements are more likely to engage in outdoor or informal labour, increasing both duration and intensity of exposure.

Despite this, pollution data is rarely correlated with housing type, income level, or occupation. Regulatory responses based on average AQI values therefore fail to address heightened vulnerability among low-income urban populations. The result is a regulatory framework that appears neutral but produces unequal outcomes.

B. Water Contamination and Caste-Based Exclusion

Water pollution reflects longstanding patterns of social exclusion. In rural and peri-urban India, Dalit hamlets and informal settlements are frequently located downstream of industrial discharge points or adjacent to contaminated water bodies[6]. While studies and investigative reports have documented these realities, official monitoring systems focus on selected sampling points rather than mapping exposure across social groups.

Without data linking contamination to caste and settlement patterns, water pollution is framed as a technical compliance issue rather than a manifestation of structural inequality. This framing limits both accountability and remedial action.

C. Industrial Pollution and Occupational Exposure

Industrial zones and hazardous waste sites are disproportionately located near low-income neighbourhoods, tribal areas, and regions with limited political influence. Migrant workers in these zones face compounded risks arising from occupational exposure and residential proximity to pollution sources[7]. Environmental regulation, however, rarely accounts for cumulative exposure, particularly where workers lack formal recognition.

Health impacts respiratory illness, skin disorders, reproductive harm remain largely undocumented within environmental governance systems, reinforcing invisibility.

D. Climate Vulnerability

Climate change amplifies existing inequalities. Coastal erosion, heat stress, flooding, and erratic rainfall disproportionately affect fisher communities, agricultural labourers, and residents of informal urban housing. Yet climate impact assessments typically rely on regional

[5] Greenpeace India, *Airpocalypse* (2018).
[6] S Anand, 'Caste and Access to Water in Rural India' (2017) 52(8) EPW.
[7] International Labour Organization, *Occupational Safety and Health in India* (ILO 2020).

projections without disaggregating vulnerability by livelihood, gender, or socio-economic status[8]. This undermines targeted adaptation and reinforces a one-size-fits-all approach.

IV. Courts, Tribunals, and the Limits of Aggregate Evidence

Indian courts have played a transformative role in environmental protection, recognising the right to a clean and healthy environment as part of Article 21 of the Constitution[9]. However, judicial reasoning remains constrained by the evidentiary frameworks provided by regulatory institutions.

Courts and the NGT frequently rely on aggregate indicators average pollution levels, compliance certificates, and expert committee reports. While these establish the existence of environmental harm, they rarely capture differentiated exposure. Judicial assessments therefore tend to be abstract, overlooking how environmental degradation intersects with caste, occupation, housing insecurity, and economic precarity.

This limitation affects compensation and remedial frameworks. Environmental compensation orders often prioritise ecological restoration over social repair. Without data identifying which groups have suffered the most severe losses, marginalised communities whose harms are informal or undocumented remain undercompensated[10].

Proceedings before the NGT particularly illustrate this problem. Technical reports submitted by pollution control boards seldom include socio-economic disaggregation, reinforcing a technocratic understanding of harm. Although the tribunal invokes principles such as sustainable development and precaution, the absence of socially granular data constrains substantive justice.

Judicial reliance on aggregate data is not necessarily a product of indifference. Courts operate within institutional constraints. However, failure to interrogate the limitations of such data risks legitimising incomplete narratives of harm. Environmental justice requires not only recognising pollution, but identifying who bears its costs.

V. Governance Failure Rather Than Technical Deficit

The persistent absence of disaggregated environmental data is often attributed to administrative incapacity. Such explanations obscure the political economy of data collection. Regulatory

[8] IPCC, *Sixth Assessment Report* (2022).
[9] Subhash Kumar v State of Bihar (1991) 1 SCC 598.
[10] MC Mehta v Union of India (Oleum Gas Leak) (1987) 1 SCC 395.

institutions prioritise compliance metrics and project clearance over social accountability. Monitoring systems are designed to demonstrate adherence to standards, not to reveal unequal exposure.

EIAs exemplify this governance failure. Baseline data remains socially undifferentiated, and public consultations are frequently reduced to procedural formalities. Language barriers, literacy constraints, and caste hierarchies limit participation, while the absence of disaggregated data allows exclusion to remain undocumented.

Regulatory capture further sustains data blindness. Disaggregated data revealing disproportionate harm could strengthen opposition to projects or invite stricter scrutiny. Aggregate indicators therefore function as tools of risk management, minimising contestation rather than addressing injustice.

Marginalised communities' absence from land records, labour registries, and welfare databases compounds the problem. Environmental governance thus mirrors and reinforces broader patterns of social exclusion.

VI. Towards Data Justice in Environmental Governance

A data justice framework requires reimagining environmental governance to centre differential exposure and vulnerability.

First, EIAs must mandate socially disaggregated baseline data, incorporating caste, livelihood, income, and settlement patterns. Social vulnerability mapping, already used in disaster governance, provides a viable model.

Second, pollution monitoring systems must expand coverage in high-risk zones, including informal settlements and industrial peripheries. Community-based monitoring can enhance both data quality and institutional accountability.

Third, courts and tribunals must adopt a critical approach to environmental evidence. Where disproportionate harm is alleged, judicial bodies should require disaggregated assessments and interdisciplinary expertise, including public health and social science inputs.

Finally, climate policy must integrate vulnerability-sensitive indicators. Disaggregating climate risk by livelihood and gender enables targeted adaptation and equitable resource allocation.

Data justice foregrounds dignity, equality, and democratic participation. By making marginalised communities visible, environmental governance can align with the constitutional promise of social justice.

VII. Conclusion: Environmental Justice Begins with Visibility

Environmental injustice in India is often attributed to weak enforcement or regulatory capture. This article has argued that an equally powerful, though less visible, driver lies in the absence of disaggregated environmental data. Aggregate measurement normalises unequal exposure and renders marginalised communities statistically invisible.

Regulatory institutions and courts rely on indicators that prioritise administrative convenience over social reality, detaching environmental protection from constitutional commitments to equality and dignity. Reimagining environmental governance through data justice enables institutions to identify who is most affected and design remedies that address substantive, not merely formal, equality.

Environmental justice cannot exist without visibility. Making marginalised communities count within environmental data systems is not only a methodological reform, but a recognition of whose lives and environments are worthy of protection.

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