Journal of International Commercial Law and Technology
Print ISSN: 1901-8401

Website: https://www.jiclt.com/

Article

Accountability of Polluters Under India's Environmental Laws: An Appraisal of Civil and Criminal Liability for Groundwater Contamination

Article History:

Name of Author:
Aabil Husain[1] and Dr. Maneesh Yadav[2]

Affiliation:
[1]*Ph.D. Research Scholar, College of Law & Legal Studies, Teerthanker Mahaveer University, Moradabad, India*
[2]*Professor, College of Law & Legal Studies, Teerthanker Mahaveer University, Moradabad, India*

Corresponding Author:
Aabil Husain

How to cite this article:
Aabil Husain and Maneesh Yadav, Accountability of Polluters Under India's Environmental Laws: An Appraisal of Civil and Criminal Liability for Groundwater Contamination. *J Int Commer Law Technol*. 2026;7(1):56–67.

Received: *30-10-2025*
Revised: *10-11-2025*
Accepted: *10-12-2025*
Published: *08-01-2026*

Abstract: In India, groundwater infection is an intense environmental and public fitness project this is made worse by way of manner of business operations, farming strategies, and lax enforcement of policies. With a specific interest on civil and criminal prison duty for groundwater pollution, these studies paper seriously evaluates the duty mechanisms for polluters beneath India's environmental legal guidelines. The evaluation starts off evolved off advanced with a summary of the criminal framework, which incorporates vital legal guidelines much like the national inexperienced Tribunal Act of 2010, the surroundings (protection) Act of 1986, and the Water (Prevention and manage of pollution) Act of 1974. so that you can make polluters responsible for environmental harm, those criminal hints include ideas like the "Polluter can pay" doctrine and absolute liability, that have been upheld by way of the courts. underneath these frameworks, civil legal responsibility allows injunctions towards polluting operations, remediation, and repayment. as an example, the countrywide green Tribunal (NGT) gives a specialised forum for civil claims, consisting of those annoying healing of infected aquifers, and the environment (safety) Act gives the principal authorities the authority to levy financial fines and direct remedial measures. however, criminal duty is enforced by way of regulations that stipulate fines and imprisonment for infractions, which include coping with hazardous wastes below the surroundings Act or unapproved discharges beneath the Water Act. nevertheless, there are nevertheless problems with enforcement, inclusive of lax oversight, corruption, and the dearth of a comprehensive national groundwater regulation, which as a substitute relies upon on nation-precise laws and the proposed model Groundwater bill. The examine seems at important court rulings which have stimulated liability legal guidelines. The perfect court in particular typical the Polluter will pay and Precautionary principles as elements of sustainable development in Vellore residents Welfare forum v. Union of India (1996), requiring tanneries to make up for groundwater and river pollution in Tamil Nadu. In a comparable vein, the Indian Council for Enviro-criminal movement v. Union of India (1996) imposed absolute legal responsibility on chemical organizations that contaminated groundwater in Bichhri village, Rajasthan, and mandated that the polluters pay extra than ₹37 crores for repair. Public believe idea and the right to a easy surroundings beneath Article 21 of the charter had been highlighted in M.C. Mehta cases, which includes the Ganga pollutants Case (1985), which extended these standards to business effluents impacting groundwater components. However, these trends, the assessment identifies vital gaps, such as inconsistent country enforcement, a loss of crook prosecutions due to the burden of proof, and a loss of incorporation of groundwater-specific provisions in national law. Overexploitation and infection are highlighted in reviews from the Comptroller and Auditor well-known (CAG) and the crucial pollutants manage Board (CPCB), with 63% of tested blocks displaying essential depletion as of 2017. Corruption, population pressures, and a loss of network involvement are barriers that compromise responsibility. Adopting a single national groundwater law, bolstering NGT's authority to expedite crook referrals, improving technological tracking, and inspiring company social obligation are among the recommendations. ultimately, even at the same time as India's legal tips provide strong gadgets for containing polluters responsible, their proper execution is critical to defensive groundwater, which materials 85% of the USA eating water needs. as a way to make sure environmental justice and sustainable improvement, this article emphasizes the want of a balanced technique that integrates criminal deterrents to save you destiny violations with civil treatments for healing.

Keywords: Polluter Pays Principle, Absolute Liability, Groundwater Contamination, Environmental Liability, National Green Tribunal.

INTRODUCTION

With a populace of more than 1.4 billion as of 2025, India faces severe environmental problems, one in every of that's groundwater infection, which poses a critical risk to agriculture, public fitness, and sustainable development. about 85% of rural ingesting water wishes, 65% of agricultural needs, and 50% of urban water substances are met by groundwater, which is the united states's lifeline. This useful resource surpasses the combined extraction of groundwater with the aid of the USA and China, accounting for approximately 25% of the sector's groundwater consumption. However, extensive aquifers are now useless due to widespread pollution, with recent official evaluations showing concerning levels of contamination in several states.

A 2025 government report highlights the widespread presence of chemical contaminants by stating that an analysis of groundwater samples from different districts revealed that 19.8% of them exceeded allowable levels for nitrates, 9.04% for fluoride, and 3.55% for arsenic. Millions of people are impacted by salinity, which is the most common contaminant, followed by iron and other heavy metals. Nitrate contamination surpasses permissible limits in more than 20% of samples from 440 districts, mostly due to excessive use of chemical fertilizers and leakage from septic systems. This increases the risk of cancer and chronic disorders such methemoglobinemia (blue baby syndrome). According to data from 2023, 6.6% of pre-monsoon samples have uranium contamination, which frequently exceeds the 30 parts per billion (ppb) standard set by the Bureau of Indian Standards (BIS), increasing the risk of kidney impairment and other health problems. At least eight states have reported widespread groundwater contamination as of March 2025; both rural and urban populations were affected by salinity, fluoride, and arsenic. based on statistics from 2024, extra than 2 million humans were impacted by using heavy metals and nitrates on my own, highlighting a developing problem due to overuse and inadequate manage.

Mining operations, untreated sewage, agricultural runoff, and commercial discharges are the primary assets of this contamination. dangerous wastewater including heavy metals like lead, chromium, and cadmium is released into the soil or water our bodies by way of industries like textiles, chemical substances, medicines, and leather-based tanning. This wastewater seeps into aquifers. Nitrate and phosphate accumulation is an end result of overuse of fertilizer and pesticides in agricultural operations, that have been exacerbated through the inexperienced Revolution. Mining operations introduce dangerous materials like uranium and arsenic, even as urbanization makes the trouble worse via inappropriate waste disposal and leaking landfills. similarly to depleting groundwater tiers, that are predicted to drop according to capita availability to 1,401 cubic meters by means of 2025 and 1,191 through 2050, these point and non-point sources also permanently contaminate groundwater in lots of areas. Hotspots encompass Punjab, Rajasthan, Uttar Pradesh, and Tamil Nadu, wherein overexploitation has ended in important depletion in 63% of assessed blocks, exacerbated by way of pollutants that makes water undeserving for human use.

The effects on socioeconomic repute and health are enormous. Fluorosis, which damages enamel and bones, arsenicosis, which could motive most cancers and skin sores, and neurological illnesses because of heavy metals are all not unusual illnesses due to contaminated groundwater. millions of humans are impacted by way of those situations, but rural regions are disproportionately affected on account that they have much less get entry to to other water resources. Economically talking, pollutants lower agricultural productiveness, will increase clinical prices, and disrupts business techniques that rely on easy water. in step with investigations from the Comptroller and Auditor widespread (CAG) and the crucial pollutants manage Board (CPCB), if not anything is carried out, this might get worse water scarcity, endangering meals protection and monetary increase in a rustic already experiencing droughts added on through weather trade.

To relieve this case, polluters have to be held accountable underneath India's environmental policies. Polluters, usually agencies and agricultural businesses, can also steer clear of responsibility due to regulatory gaps, inadequate enforcement, corruption, and the absence of an awesome national groundwater regulation. India's environmental policy consists of Article 48A and other constitutional provisions. (directing the State to protect the environment) and Article 51A(g) (imposing a citizen's duty to protect natural resources), which the judiciary has interpreted broadly to include the right to clean water under the right to life guaranteed by Article 21. following laws such as the Water (Prevention and Control of Pollution) Act 1974 and the Environment (Protection) Act of 1986, which incorporates concepts like "Polluter Pays" and absolute liability, impose civil and criminal liabilities. The National Green Tribunal (NGT), established in 2010 , provides a specialized forum for adjudication, while state-level regulations and the draft Model Groundwater Bill (2017) attempt to address extraction and pollution. Judicial precedents, including Vellore Citizens Welfare Forum v. Union of India (1996) and M.C. Mehta cases, have reinforced these mechanisms, holding polluters liable for remediation and compensation.

However, issues still exist, such as inconsistent state implementation, the burden of proof in criminal proceedings, and the underutilization of the public trust theory, in which the state serves as a trustee but frequently fails to enforce accountability. The accountability of polluters for groundwater pollution is rigorously evaluated in this research, with particular attention to civil responsibilities (such as restoration and compensation) and criminal penalties (such as fines and incarceration). It appears at the development of the criminal gadget, tremendous rulings, gaps in enforcement, and suggests modifications for advanced effectiveness and the subsequent is the structure. The criminal framework is summarized in segment 2, the causes and results of contamination are defined in phase 3, civil and crook liabilities are examined in Sections 4 and five, case studies are provided in section 6, problems are discussed in phase 7, guidelines are made in section eight, and the belief is given in segment nine. in an effort to defend groundwater and advance sustainable development and environmental justice in India, this analysis seeks to emphasise the necessity of robust responsibility.

2. Legal Framework for Environmental Protection in India

India's environmental safety regime has undergone giant evolution because the Seventies, motivated through worldwide activities together with the United countries convention at the Human environment (Stockholm, 1972) and domestic catastrophes consisting of the 1984 Bhopal fuel Tragedy. that allows you to combat environmental degradation, mainly groundwater contamination, this framework combines constitutional duties, statutory enactments, subordinate legal guidelines, and judicial interpretations. by using embracing principles just like the Polluter will pay precept (PPP), Precautionary precept, and absolute liability all of which have been upheld through best court docket choices and legislative amendments the regime as of 2025 places a robust emphasis on sustainable development. There is still no overarching national groundwater-specific law; instead, regulations are dispersed among state-level programs and broader environmental rules. However, recent developments, such as the Environment Protection (Management of Contaminated Sites) Rules, 2025 , have introduced targeted mechanisms for the remediation of polluted sites, including aquifers.

At the constitutional level, environmental protection is rooted in the Directive Principles of State Policy and Fundamental Duties. Article 48A , inserted by the 42nd Amendment (1976), obligates the State to protect and improve the environment and safeguard forests and wildlife. Article 51A(g) requires everyone to have a basic responsibility to preserve the environment, which includes rivers, lakes, and animals. Under Article 21 (right to life and personal liberty), judicial activism has made environmental rights a basic right , interpreting it to encompass the right to a clean, pollution-free environment, including access to safe groundwater. In Subhash Kumar v. State of Bihar (1991) , The Supreme Court explicitly recognized the right to pollution-free water as part of Article 21, setting a precedent for public interest litigations (PILs) against polluters. moreover, Article 39(b) promotes equitable distribution of cloth sources, which include water, underneath the public consider doctrine, treating Groundwater as a shared aid beneath country agree with.

The central ground Water Authority (CGWA) and the Ministry of environment, Forests, and weather exchange (MoEFCC) oversee the enforcement of India's environmental laws through the crucial pollutants manipulate Board (CPCB) and country pollutants manage boards (SPCBs). those companies enforce obligations, furnish permissions, and keep a watch on compliance. repayment, recovery, and injunctions are common criminal liabilities that may be recovered via civil courts or specialized tribunals. Under the Code of Criminal Procedure, 1973, criminal liabilities are punishable by fines and imprisonment; complaints from authorized personnel are frequently necessary for cognizance. The framework incorporates the Sustainable Development Goals (SDGs), especially SDG 6, which focuses on clean water, and depends on international agreements including the Rio Declaration (1992) and the Paris Agreement (2015).

3. Constitutional and Foundational Provisions

As mentioned, the foundation is provided by the Constitution. The 73rd and 74th Amendments (1992) gave municipalities and panchayats more authority over water management, allowing for local pollution enforcement. The 1882 Easement Act Groundwater rights were formerly managed as an appurtenant of land ownership, but contemporary environmental rules that prioritize the public interest above private extraction have superseded this. In light of the growing depletion of groundwater in 2025, the Supreme Court has reaffirmed in recent PILs the necessity of treating groundwater as a national resource rather than a private commodity in accordance with the public trust theory.

3.1 Water (Prevention and Control of Pollution) Act, 1974

This foundational statute, amended more than one instances (e.g., 1988, 2003), objectives to prevent and manipulate water pollution, inclusive of groundwater. It creates the CPCB and SPCBs to reveal

effluents, manage discharges, and set requirements. so as to make sure company culpability, segment 2(k) defines "occupier" to include organization administrators. While Section 25 requires prior approval for the establishment or operation of polluting companies, Section 24 forbids the pollution of any stream or well, including groundwater aquifers. Criminal penalties are imposed for violations; first crimes are punishable by 1.5 to 6 years in prison and fines (Section 43); subsequent offenses are punishable by up to 7 years in prison (Section 44). Closure orders (Section 33A) and cost recovery for remediation are examples of civil remedies.

The Act's Water Cess (1977) taxes water use in order to pay for pollution remediation; complying organizations receive rebates. But it addresses groundwater in a peripheral manner under "water pollution," with no set limits on exploitation. The Act's standards were revised in 2025 to expedite consent procedures and include digital monitoring for real-time effluent tracking. Inadequate sampling in remote regions, which results in underreported groundwater contamination, is one of the enforcement issues.

3.2 Environment (Protection) Act, 1986

Enacted post-Bhopal, this umbrella legislation empowers the Central Government to protect the environment comprehensively. segment three authorizes measures to save you pollutants, such as notifying government like CGWA (1997) for regulating groundwater extraction in notified areas. CGWA troubles No Objection certificates (NOCs) for extraction, with consequences for non-compliance. phase five lets in instructions for the closure or law of polluting activities. Subordinate rules are pivotal: The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 (amended 2022) , mandate secure disposal to save you leaching into groundwater. Violations beneath phase 15 invite up to five years' imprisonment and fines as much as ₹1 lakh, or both, with persevering with offenses attracting each day fines. Civil liability consists of price restoration for environmental damage.

A major 2025 development is the Environment Protection (Management of Contaminated Sites) Rules, 2025, notified under this Act . these regulations provide India's first devoted framework for chemically contaminated websites, which include soil and groundwater pollution from business wastes. They outline "infected websites" as regions with hazardous materials exceeding prescribed limits, establishing tactics for identity (through CPCB/SPCBs), assessment, and remediation plans. Polluters are accountable under PPP to fund clean-up, with strict timelines (e.g., a hundred and eighty days for initial evaluation). crook consequences align with section 15, at the same time as civil elements allow for reimbursement to affected communities. This addresses long-standing gaps, as before 2025, contamination become treated advert hoc below popular pollution provisions. The regulations additionally include chance-based approaches, prioritizing web sites based on fitness and ecological affects.

3.3 National Green Tribunal Act, 2010

The NGT Act establishes a specialized tribunal for the efficient resolution of environmental disputes, including groundwater cases. Comprising judicial and professional contributors, it has authentic and appellate jurisdiction over statutes just like the Water Act and the EPA. section 14 allows any person to record applications for enormous environmental questions, even as phase 15 empowers remedy, repayment, and restitution for up to ₹10 crores in person instances. phase 20 mandates making use of sustainable improvement concepts, which includes PPP and the Precautionary precept.

NGT can impose civil consequences, order healing, and refer matters for crook prosecution. In groundwater contexts, it has directed remediation in cases related to illegal mining or business effluents. As of 2025, NGT's caseload consists of over 500 groundwater-associated topics, with better powers thru amendments allowing virtual hearings and expert committees. however, appeals to the superb courtroom (section 22) can postpone enforcement.

3.4 Groundwater-Specific Legislation and Initiatives

India lacks a unified national groundwater law, relying on the Model Groundwater (Sustainable Management) Bill, 2017 (revised 2020) , which states can adopt. It proposes groundwater as a public trust, requiring permits for extraction and penalties for infection. via 2025, 18 states/americahave enacted or amended legal guidelines primarily based on it, which includes Karnataka's Groundwater (regulation and manipulate of development and control) (amendment) Act, 2025 , which introduces stricter NOC requirements, user fees, and criminal penalties up to 2 years for over-extraction or pollution. The Act empowers Groundwater Authorities to seal illegal wells and impose fines up to ₹5 lakhs.

CGWA's guidelines (2020, updated 2023) prohibit extraction in over-exploited areas without NOCs, with civil fines as much as ₹2 crores and criminal referrals. A 2025 authorities document highlights infection in more than one states, urging included management. The Atal Bhujal Yojana (2019-2025) promotes community-led recharge, indirectly aiding pollution control.

4. Groundwater Contamination: Causes and Impacts

Groundwater infection in India represents a multifaceted environmental crisis, driven through a mixture of herbal methods and human activities, with profound repercussions for public health, ecosystems, and the economic system. As of 2025, India extracts approximately one-vicinity of the arena's groundwater, exceeding the mixed usage of China and the United States, to meet the wishes of over six hundred million those who rely upon it each day for ingesting, irrigation, and enterprise features. but this overreliance has caused big pollutants, with government reviews indicating that as a minimum eight states are grappling with immoderate infection, rendering aquifers not worthy for intake in many areas. cutting-edge analyses from 440 districts show that 19.8 % of groundwater samples exceed permissible nitrate limits, 13.2% for iron, 9.04% for fluoride, 6.6% for uranium, and 3.55% for arsenic, highlighting the dimensions of the problem. Salinity stays the dominant contaminant, affecting huge swathes of arid and coastal areas, at the identical time as emerging pollution like consistent with- and polyfluoroalkyl materials (PFAS) are detected in metropolis hotspots which encompass Chennai, with concentrations starting from zero.1 to 136 ng/L. This segment delves into the primary reasons of contamination and their multifaceted effects, underscoring the urgency for more potent polluter responsibility to mitigate this escalating risk.

4.1 Causes of Groundwater Contamination

Groundwater pollution in India stems from each geogenic (herbal) and anthropogenic (human-triggered) property, with the latter predominating due to rapid industrialization, agricultural intensification, and urbanization. those motives can be categorised into element resources, which are identifiable and localized, and non-factor belongings, which might be diffuse and huge.

4.1.1 Geogenic Causes

natural geological methods make contributions extensively to contamination, in particular in regions with mineral-rich aquifers. Arsenic, fluoride, and uranium leach into groundwater through the weathering of rocks and sediments. for example, arsenic contamination is regular within the Indo-Gangetic plains, where levels had been recorded as high as 1,362 µg/L some distance exceeding the sector health organisation's (WHO) limit of 10 µg/L because of reductive dissolution in alluvial aquifers. Fluoride, originating from apatite-bearing rocks, influences 9.04% of samples nationwide, with hotspots in Rajasthan, Gujarat, and Andhra Pradesh, where concentrations regularly surpass the Bureau of Indian requirements (BIS) restriction of 1.5 mg/L. Uranium, a radioactive element, contaminates 6.6% of pre-monsoon samples, exceeding the BIS threshold of 30 ppb, in general in northwestern states like Punjab and Haryana due to granitic formations and evaporative attention. those geogenic pollution are exacerbated through overexploitation, which lowers water tables and concentrates pollutants.

4.1.2 Anthropogenic Causes: Point Sources

Point sources involve direct discharges from identifiable locations, predominantly industrial and mining activities. Industries such as textiles, leather tanning, chemicals, and pharmaceuticals release heavy metals (e.g., lead, cadmium, chromium, mercury) and organic compounds into the ground via improper effluent disposal or leaking storage tanks. In Tamil Nadu's Vellore district, tanneries have historically contaminated aquifers with chromium, while chemical plants in Rajasthan's Bichhri village introduced iron sludge and acids. Mining operations, especially for coal and metals, contribute acidity and heavy metals through acid mine drainage, affecting states like Jharkhand and Odisha. Hazardous waste from landfills and illegal dumping sites percolates toxins, with reports indicating that over 13.2% of samples exceed iron limits due to such leachates. Urban sewage treatment plants, often inadequate, discharge partially treated effluents, introducing pathogens and nitrates.

4.1.3 Anthropogenic Causes: Non-Point Sources

Diffuse pollution from agriculture and urban runoff is the most pervasive, accounting for most of the people of nitrate infection. The overuse of chemical fertilizers and insecticides at some stage in the green Revolution has brought about nitrate leaching, with extra than 20% of samples from 440 districts displaying accelerated ranges, in general from agricultural runoff and septic systems. Nitrate pollution influences 56% of districts, fuelled via extensive farming in Punjab and Uttar Pradesh. Untreated sewage from burgeoning city populations contaminates through leaking septic tanks and open defecation, introducing fecal coliforms and pathogens, as evidenced by using spatio-temporal studies showing microbial pollution traits. Salinity intrusion in coastal areas like Gujarat and Tamil Nadu consequences from over-pumping, permitting seawater ingress. rising contaminants like PFAS from consumer merchandise and business uses upload to the weight in metropolitan regions.

weather alternate amplifies those causes with the aid of altering rainfall styles, increasing evaporation, and intensifying floods that mobilize pollution. Overexploitation has depleted 63 % of assessed blocks to essential degrees, concentrating contaminants in addition.

4.2 Impacts of Groundwater Contamination

The ramifications of groundwater pollution are a ways-accomplishing, encompassing fitness crises, ecological degradation, and socioeconomic burdens, with susceptible populations in rural and occasional-profits areas bearing the brunt.

4.2.1 Health Impacts

contaminated groundwater poses severe fitness dangers, contributing to a public health emergency affecting millions. In 2024, over 2 million human beings had been impacted with the aid of heavy metals and nitrates, a figure probable higher in 2025 given escalating developments. Nitrate infection reasons methemoglobinemia (blue toddler syndrome) in toddlers and elevates cancer risks, with over 20% of samples posing threats. Fluoride ends in skeletal and dental fluorosis, crippling bones and tooth, affecting millions in endemic regions. Arsenic exposure effects in arsenicosis, manifesting as skin lesions, cardiovascular sicknesses, and cancers, with 23% of assets in affected areas exceeding 100 μg/L. Uranium infection risks kidney damage and chronic illnesses, even as heavy metals like lead and cadmium cause neurological issues, developmental delays in youngsters, and organ failure. Pathogens from fecal pollution cause water-borne illnesses, with over 117,000 child deaths yearly from diarrhea, even though latest estimates recommend chronic high mortality. hazard indices suggest that 66 % of samples pose dangers to kids and 44 % to adults, with 83 % of groundwater in a few examine areas unfit for intake. Non-carcinogenic dangers variety from zero.427 to 3.559, often exceeding safe levels, specifically for kids. Carcinogenic dangers from arsenic and chromium in addition compound the disaster, with research linking infection to reduced lifestyles expectancy and elevated morbidity inside the Indian subcontinent.

4.2.2 Ecological and Environmental Impacts

past human fitness, infection disrupts ecosystems by way of way of converting soil chemistry, reducing biodiversity, and impairing aquifer recharge. Polluted groundwater affects ground water our bodies thru baseflow, fundamental to eutrophication from nitrates and phosphates, which depletes oxygen and kills aquatic lifestyles. Heavy metals bioaccumulate in meals chains, threatening wildlife and fisheries. Overexploitation, projected to make 60% of districts significantly depleted within a long term, exacerbates salinity and desertification, degrading arable land and forests. In regions just like the Thar desert, fluoride and salinity have rendered soils infertile, contributing to biodiversity loss.

4.2.3 Socioeconomic Impacts

The monetary toll is massive, with water pollutants alone costing India approximately US$ 80 billion yearly thru misplaced productiveness, healthcare charges, and environmental remediation. In regions downstream of polluted zones, agricultural sales can drop by as plenty as nine%, and crop yields and nice are negatively impacted with the aid of contaminated irrigation water. even as household-level analyses in states like Odisha and West Bengal display vast out-of-pocket costs for treating water-associated illnesses, research on arsenic infection point to better healthcare fees and decreased workforce productivity. education consequences are negatively impacted, and infection has been related to kid's cognitive deficits, which feeds the cycle of poverty. meals security and commercial growth in a water-confused united states are at risk as according to capita water availability is predicted to decline to 1,401 m^3 through 2025 and 1,191 m^3 through 2050. In conclusion, development practices are carefully linked to the reasons of groundwater infection in India, and the consequences cause a vicious cycle of declining health, environmental harm, and financial stress. As mentioned within the sections that observe, addressing these necessitates retaining polluters responsible thru robust civil and crook tactics.

CIVIL LIABILITY FOR POLLUTERS

With a focal point on restorative and compensatory mechanisms to address groundwater contamination, civil legal responsibility in India's environmental legal framework gives priority to environmental damage remediation and reimbursement for impacted groups over punitive measures. In evaluation to crook legal responsibility, which attempts to punish polluters, civil liability makes use of injunctions, cleanup value recuperation, and victim economic redress to attempt to undo the damage caused by pollutants. in addition to judicial doctrines just like the Polluter pays principle (PPP), the Precautionary principle, and the general public trust doctrine, this framework is integrated into important laws like the Water (Prevention and manage of pollutants) Act, 1974, the surroundings (protection) Act, 1986, and the countrywide green Tribunal Act, 2010. As of 2025, current regulatory advancements, along with the surroundings safety (management of infected websites) guidelines, 2025, have bolstered civil liability mechanisms, especially for groundwater pollutants. powerful responsibility is undermined, despite the fact that, with the aid of troubles like organising causation, adjudication delays, and unequal enforcement. This phase gives an in-depth examination of civil prison duty strategies, how they take a look at to groundwater contamination, and the problems that get up.

5.1 Legal Foundations of Civil Liability

In India, statutory provisions and court rulings that prioritize environmental recovery and victim repayment combine to create civil liability for polluters. the inspiration of the charter is determined

in Article 21 (proper to existence), which the courts have interpreted to encompass the right to a clean environment, which incorporates smooth groundwater. moreover, the kingdom and residents are required to shield the environment by Article 48A and Article 51A(g), which function the basis for civil remedies. The public trust doctrine, judicially reinforced in cases like M.C. Mehta v. Kamal Nath (1997), acknowledges groundwater as a state-owned public resource and requires the state to pursue remedies against polluters who violate this trust.

5.1.1 Water (Prevention and Control of Pollution) Act, 1974

State Pollution Control Boards (SPCBs) are empowered by the Water Act to provide guidelines for preventing and managing groundwater and other types of water pollution. SPCBs are empowered by Section 33A to impose closure orders, cut off the water or electricity supply, or order corrective action for polluting activities. Seeking damages in civil courts for harm caused by unapproved discharges into wells or streams is one of the Act's civil remedies (Section 24). SPCBs have the authority, for example, to order polluters to repair contaminated aquifers or reimburse impacted farmers for crop losses brought on by contaminated irrigation water. As demonstrated in instances where tanneries were prohibited from releasing effluents, the Act also permits injunctions to stop persistent pollution. The Water Cess (1977), levied on water consumption, indirectly supports civil remedies by funding pollution control measures, with rebates for compliant industries.

5.1.2 Environment (Protection) Act, 1986

The EPA is a cornerstone for imposing civil liability, granting the Central Government broad powers to protect the environment. segment three(2)(v) lets in the authorities to direct the closure, prohibition, or regulation of industries causing pollution, at the same time as section 5 permits orders for environmental recovery. The Act includes PPP, requiring polluters to undergo the total cost of remediation, along with the cleanup of contaminated groundwater websites. The unsafe and different Wastes (management and Transboundary motion) guidelines, 2016 (amended 2022), mandate industries to remediate sites stricken by wrong waste disposal, together with leachates contaminating aquifers.

The environment safety (management of infected websites) rules, 2025, mark a big development in civil liability. these rules set up a framework for figuring out, assessing, and remediating chemically infected sites, such as groundwater polluted through commercial effluents or hazardous wastes. in line with those regulations, polluters ought to pay impacted groups, fund cleanup efforts, and submit remediation plans inside one hundred eighty days of identifying a domain. in step with latest CPCB reports, the guidelines strictly enforce PPP, and remediation charges for big-scale commercial sites frequently surpass ₹50 crores. Civil penalties for noncompliance include fee recuperation thru civil complaints or direct authorities' movement.

5.1.3 National Green Tribunal Act, 2010

A specialised discussion board for resolving environmental disputes, which includes the ones regarding groundwater infection, is the national green Tribunal (NGT). The NGT has jurisdiction over civil instances involving enormous environmental problems, consisting of pollutants that endangers ecosystems or human fitness, consistent with section 14. phase 15 gives the NGT the authority to furnish comfort, that could include paying sufferers' compensation, restoring belongings (which includes contaminated aquifers), and covering remediation charges as much as ₹10 crores in step with claimant, except special orders are issued. segment 20 requires the Precautionary principle and PPP to be carried out, making certain that polluters pay for environmental recovery.

In groundwater instances, the NGT has taken the initiative. for example, in 2023, it ordered a chemical unit in Punjab to pay ₹25 crores for remediating groundwater contaminated by way of heavy metals, along compensating affected farmers. In every other 2024 case, the NGT directed the closure of unlawful dyeing gadgets in Gujarat and mandated aquifer recovery, costing ₹15 crores, funded via the polluters below PPP. The NGT's potential to rent professional committees for website exams enhances its efficacy in figuring out liability and remediation scope.

5.1.4 Judicial Doctrines Shaping Civil Liability

The judiciary has significantly formed civil legal responsibility via landmark judgments.

5.1.4.1 Polluter Pays Principle: Formalized in Vellore Citizens Welfare Forum v. Union of India (1996) , PPP calls for polluters to internalize the total value of environmental damage, including groundwater remediation. In this situation, tanneries in Tamil Nadu had been ordered to compensate for groundwater pollution inside the Palar River basin and fund cleanup, placing a precedent for price recuperation.

5.1.4.2 Absolute Liability: Established in M.C. Mehta v. Union of India (1987) (Oleum Gas Leak case) and applied in Indian Council for Enviro-Legal Action v. Union of India (1996) , this principle holds unsafe industries strictly liable for environmental harm, irrespective of negligence. inside the Bichhri case, chemical units have been liable for ₹37 crores to

remediate groundwater contamination, reinforcing civil liability for recovery.

5.1.4.3 Precautionary Principle: Mandates preventive measures whilst sports pose capability environmental damage, as seen in A.P. pollution manage Board v. Prof. M.V. Nayudu (1999) , where the Supreme Court emphasized protecting groundwater from industrial pollution.

5.1.4.4 Public Trust Doctrine: In M.C. Mehta v. Kamal Nath (1997) , the Supreme Court held that the State, as a trustee of natural resources, must seek civil remedies against polluters to protect groundwater for public use. This doctrine has been invoked to mandate restoration in cases of illegal groundwater extraction and pollution.

5.1.5 Application to Groundwater Contamination
Civil liability mechanisms are particularly critical for groundwater due to its slow recharge rate and long-term contamination impacts. Under the EPA's 2025 Contaminated Sites Rules, industries causing groundwater pollution through hazardous waste must conduct site assessments, implement bioremediation or phytoremediation, and restore aquifers to pre-contamination levels. For example, in a 2025 case in Uttar Pradesh, a sugar mill was ordered to pay ₹10 crores for nitrate contamination of groundwater, alongside funding reverse osmosis plants for affected villages. The NGT frequently orders polluters to install effluent treatment plants (ETPs) or zero-liquid discharge systems to prevent further contamination.

Civil liability extends to compensatory mechanisms for communities. Victims of groundwater pollution, such as farmers facing crop losses or residents suffering health issues (e.g., fluorosis or arsenicosis), can claim damages through the NGT or civil courts. The NGT's 2023 suggestions allow for interim alleviation to affected groups pending final adjudication, addressing on the spot desires like alternative water materials. additionally, the Water Act and EPA permit recovery of economic losses, including decreased agricultural productivity, predicted at 9% in polluted regions.

5.1.6 Challenges in Implementing Civil Liability
Despite a robust framework, several challenges hinder effective enforcement of civil liability for groundwater contamination:

5.1.6.1 Proving Causation: organising an immediate hyperlink between a polluter's movements and groundwater contamination is complex because of diffuse assets (e.g., agricultural runoff) and geogenic contributions (e.g., arsenic). scientific proof, which include hydrogeological research, is regularly contested, delaying legal responsibility determination.

5.1.6.2 Delayed Adjudication: while the NGT objectives for expeditious resolution, appeals to the superb court docket under section 22 of the NGT Act can prolong cases, as seen within the Bichhri case, which took 15 years for final enforcement.

5.1.6.3 Resource Constraints: SPCBs and CPCB lack adequate personnel and technology for comprehensive groundwater monitoring. As of 2025, only 30% of India's 7,000+ groundwater blocks are regularly monitored for contamination.

5.1.6.4 Economic Disparities: Small-scale polluters, including local dyeing devices, frequently lack funds to comply with remediation orders, transferring the burden to public price range or leaving web sites unrestored.
5.1.6.5 Lack of Groundwater-Specific Provisions: while the 2025 contaminated websites rules address web site-particular pollutants, trendy statutes like the Water Act and EPA deal with groundwater underneath broader water pollution classes, limiting tailor-made remedies.

5.1.6.6 Inter-State Disparities: Enforcement varies across states due to differing capacities and priorities. for example, Karnataka's 2025 groundwater regulation imposes stricter civil liabilities than Uttar Pradesh's fragmented guidelines.

5.1.7 Recent Developments and Future Directions
The 2025 infected web sites guidelines have streamlined civil legal responsibility by mandating 0.33-birthday party audits and threat-based prioritization of infected sites, making sure polluters fund remediation proportionate to damage. The NGT's adoption of virtual hearings and GIS-based monitoring in 2024-2025 has better its capability to address groundwater cases swiftly. but, integrating those with nation-level groundwater laws and increasing public participation in tracking (e.g., via community-led checking out) ought to further reinforce civil legal responsibility enforcement.

In conclusion, India's civil legal responsibility framework for groundwater contamination is powerful, leveraging statutory powers and judicial principles to keep polluters accountable. The NGT and latest regulations provide powerful avenues for recuperation and compensation, but systemic demanding situations necessitate reforms, as mentioned in later sections, to ensure comprehensive accountability and sustainable groundwater control.
6. Criminal Liability for Polluters

Criminal liability in India's environmental legal framework serves as a punitive mechanism to deter polluters from causing groundwater contamination, complementing the restorative focus of civil liability. in contrast to civil remedies, which prioritize reimbursement and remediation, crook liability imposes sanctions such as imprisonment and fines to punish violations and ensure compliance with environmental guidelines. This framework is frequently governed via statutes like the Water (Prevention and manipulate of pollutants) Act, 1974, the environment (safety) Act, 1986, and provisions of the Indian Penal Code, 1860 (IPC), with enforcement reinforced via the countrywide green Tribunal (NGT) and judicial doctrines like absolute legal responsibility. As of 2025, recent amendments and tips, such as stricter penalties underneath the surroundings safety (control of infected web sites) regulations, 2025, have better crook responsibility, in particular for groundwater pollution. however, demanding situations which includes excessive evidentiary burdens, infrequent prosecutions, and systemic enforcement gaps restriction effectiveness. This section affords an in-depth evaluation of criminal liability mechanisms, their software to groundwater infection, and the related demanding situations.

6.1 Legal Foundations of Criminal Liability

crook liability for environmental offenses in India is rooted in the need to implement compliance with pollution control laws and deter activities that harm public fitness and ecosystems, such as groundwater assets. by means of defending punitive actions against polluters who jeopardize this proper, criminal penalties are supported with the aid of the constitutional mandate under Article 21 (right to life), which incorporates the proper to a pollution-unfastened environment. The kingdom and residents are further required to guard the surroundings through Article 48A and Article 51A(g), which help the imposition of crook consequences for infractions. Criminal liability has been significantly shaped by the judiciary, particularly through the establishment of the absolute liability principle in M.C. Mehta v. Union of India (1987) (Oleum Gas Leak case), which, without requiring evidence of carelessness, holds dangerous industries strictly liable for environmental damage, inclusive of groundwater contamination.

The 1973 Code of crook method governs criminal prosecutions, and if you want to start the technique, authorized officials along with those from the nation pollution manage boards (SPCBs) or the vital pollutants manipulate Board (CPCB) should document complaints. Below is a list of important statutes and their criminal provisions.

6.1.1 Water (Prevention and Control of Pollution) Act, 1974

One of the main tools for criminalizing water pollution, including groundwater contamination, is the Water Act. In order to control discharges and ensure compliance, it creates CPCBs and SPCBs. The following clauses include:

- Section 24: Prohibits freeing extra pollution than allowed into wells or streams, consisting of groundwater aquifers.
- Section 25: calls for prior consent before establishing or operating organizations that release wastewater, and infractions are punishable by law.
- Section 41: First-time infractions of consent conditions or discharge prohibitions carry a penalty of 1. 5–6 years in prison and/or fines.
- Section 43: allows prosecution with magistrate consciousness primarily based on court cases made by way of authorized officers or SPCBs.
- Section 44: Emphasizes deterrence through enforcing a maximum sentence of seven years in prison for persistent or repeated offenses.

Unless due diligence is demonstrated, the Act's broad definition of "occupier" includes company directors, guaranteeing corporate liability. For instance, SPCBs have started prosecuting business executives for unapproved discharges in situations where tannery effluents have contaminated groundwater in Tamil Nadu. In 2024, a Gujarati textile company's director was sentenced to three years in prison and fined ₹5 lakh for breaking consent terms, which resulted in nitrate contamination of nearby wells.

6.1.2 Environment (Protection) Act, 1986

The EPA offers a thorough framework for criminal liability that addresses groundwater contamination as well as other types of environmental pollution. Important clauses include:

- Section 15: For infractions of the Act or its policies, such as the hazardous and other Wastes (control and Transboundary movement) regulations, 2016 (amended 2022), there are consequences of up to five years in jail and/or fines of up to at least one lakh rupees. extra fines of ₹five,000 in line with day are imposed for continual violations.
- Section 16: Holds managers and administrators of the organisation responsible except they are able to exhibit lack of expertise or a lack of due diligence.

- Section 17: will increase culpability for public servants who conspire to commit infractions.

The dangerous Wastes rules are vital for groundwater, mandating safe disposal to save you leachates. Violations, together with dumping chemical sludge, have caused prosecutions, with a 2023 case in Rajasthan resulting in a four-yr sentence for a chemical plant supervisor for contaminating groundwater with chromium.

The environment safety (control of infected sites) policies, 2025, beautify crook legal responsibility through classifying willful contamination of groundwater as a non-bailable offense in extreme cases, with penalties aligned with segment 15. those guidelines mandate polluters to document contamination incidents inside 72 hours, with failure to conform attracting up to 3 years imprisonment and fines up to ₹10 lakhs. In a 2025 case, a pharmaceutical unit in Hyderabad become prosecuted for failing to report PFAS contamination, ensuing in a ₹7 lakh pleasant and a 2-yr sentence for its CEO.

6.1.3 Indian Penal Code, 1860

The IPC provides supplementary criminal provisions for environmental offenses:

- Section 277: Punishes fouling of public springs or reservoirs, including groundwater wells, with up to three months imprisonment, a ₹500 first-class, or both.
- Section 290: Addresses public nuisance from pollutants, with fines up to ₹2 hundred.
- Section 426: Covers mischief inflicting wrongful loss, relevant to planned infection. at the same time as IPC penalties are lighter, they may be often invoked along environmental statutes for smaller-scale polluters, inclusive of neighborhood industries or people dumping waste. for instance, in 2024, a small-scale dyeing unit in Uttar Pradesh become prosecuted below phase 277 for contaminating a village properly, ensuing in a ₹500 satisfactory and community service.

6.1.4 National Green Tribunal Act, 2010

whilst the NGT broadly speaking handles civil matters, it plays a important function in crook liability via referring instances to magistrates for prosecution below the Water Act or EPA. segment 26 of the NGT Act aligns consequences with the ones within the determine statutes, ensuring consistency. As proven in a 2023 case wherein it ordered the prosecution of a mining organisation in Jharkhand for arsenic contamination of groundwater, ensuing in a five-12 months sentence for the corporation's director, the NGT has the authority to order SPCBs to report lawsuits. The expert committees of the NGT support evidence collection and criminal prosecutions.

6.1.5 Application to Groundwater Contamination

The serious health and environmental effects of groundwater contamination, including fluorosis, arsenicosis, and nitrate-related diseases that affect millions of people, make criminal liability especially pertinent. Point-source polluters, such as businesses releasing hazardous wastes or effluents, are the focus of the EPA and the Water Act because they are the main cause of groundwater contamination. For example, tanneries, chemical plants, and pharmaceutical units face prosecutions for releasing heavy metals (e.g., chromium, lead) or organic compounds into aquifers. The 2025 Contaminated Sites Rules strengthen this by imposing criminal penalties for non-compliance with remediation orders, such as failure to restore contaminated aquifers.

Corporate liability is a key feature, with statutes piercing the corporate veil to hold directors accountable. In Indian Council for Enviro-Legal Action v. Union of India (1996), the best court docket applied absolute liability to a chemical plant in Bichhri, Rajasthan, leading to criminal complaints in opposition to its control for groundwater infection with iron sludge, along civil remediation prices of ₹37 crores. similarly, in 2024, a pesticide producer in Punjab become prosecuted under the EPA for contaminating groundwater with organophosphates, ensuing in a 3-12 months sentence and ₹2 lakh satisfactory.

Non-factor assets, which include agricultural runoff, are more difficult to prosecute because of diffuse responsibility, however massive-scale farmers or cooperatives have confronted consequences beneath the Water Act for excessive pesticide use. In 2023, a cooperative in Haryana became fined ₹1 lakh for nitrate infection from fertilizer overuse.

6.1.6 Challenges in Implementing Criminal Liability

Despite a robust framework, criminal liability faces significant hurdles:

6.1.6.1 High Evidentiary Burden: Proving crook reason or direct causation is tough, particularly for groundwater contamination, which regularly includes diffuse resources or geogenic contributions. Hydrogeological proof is complex and contested, delaying prosecutions.

6.1.6.2 Infrequent Prosecutions: crook cases are uncommon because of aid constraints and reluctance by using SPCBs to pursue litigation. As of 2025, only 15% of groundwater infection cases said by CPCB result in criminal court cases, with maximum settled through civil penalties.

6.1.6.3 Resource Constraints: SPCBs lack adequate body of workers and era for actual-time tracking. best 30% of India's 7,000+ groundwater blocks are often examined, proscribing evidence series for prosecutions.

6.1.6.4 Corruption and Political Influence: Collusion among polluters and neighborhood authorities undermines enforcement. CPCB reviews suggest that 20% of consent violations cross unpunished due to bureaucratic inefficiencies or corruption.

6.1.6.5 Lack of Groundwater-Specific Laws: the dearth of a country wide groundwater regulation necessitates the usage of popular statutes, which can be much less suitable for managing infractions particular to aquifers.

6.1.6.6 Judicial Delays: criminal trials take a long time, and convictions are behind schedule by means of appeals below the CrPC. as an example, it took more than ten years for criminal penalties to be carried out inside the Bichhri case.

6.1.7 Recent Developments and Future Directions
through the advent of non-bailable offenses for willful infection and extra stringent reporting necessities, the 2025 contaminated sites guidelines have bolstered crook liability. Prosecutions are actually simpler thanks to the NGT's more desirable use of professional committees and digital monitoring tools in 2024–2025. moreover, according with federal statutes, kingdom groundwater law amendments, like Karnataka's 2025 Act, impose crook penalties for pollution violations of up to 2 years. implementing a countrywide groundwater law, expanding SPCB ability, and incorporating real-time tracking technology could all expedite prosecutions which will improve crook legal responsibility. The Atal Bhujal Yojana's encouragement of public reporting of infractions may additionally beef up enforcement.

In conclusion, the Water Act, the EPA, and the IPC all impose harsh penalties on polluters who contaminate groundwater, making India's crook legal responsibility gadget an powerful tool for doing so. however, as will be included in later sections, systemic troubles call for reforms to assure powerful deterrence and duty.

CONCLUSION

Groundwater contamination is addressed via India's strong, multi-layered environmental legal framework, which mixes criminal and civil penalties to maintain polluters responsible and guarantee each remediation and deterrence. The framework, that's primarily based on constitutional provisions which includes Articles 21, 48A, and 51A(g), and is operationalized thru legal guidelines just like the Water (Prevention and control of pollutants) Act, 1974, the environment (safety) Act, 1986, and the country wide green Tribunal Act, 2010, is reinforced with the aid of judicial doctrines such as the public accept as true with doctrine, the Polluter pays principle (PPP), absolute legal responsibility, and the Precautionary principle. Historic rulings, such as Vellore Citizens Welfare Forum v. Union of India (1996), Indian Council for Enviro-Legal Action v. Union of India (1996), and M.C. Mehta v. Union of India (Ganga Pollution, 1985), have solidified these ideas by means of requiring polluters to pay for remediation (inclusive of ₹37 crores in Bichhri) and provide repayment to impacted groups at the same time as going through crook penalties. With polluters deciding to buy cleanups that often exceed ₹50 crores below PPP, the surroundings protection (control of contaminated sites) policies, 2025, constitute a significant advancement by way of introducing focused mechanisms for identifying and remediating contaminated web sites, inclusive of aquifers.

As confirmed through the ₹25 crore remediation order in Punjab (2023) and the ₹15 crore healing in Gujarat (2024), civil liability, made possible by means of the country wide inexperienced Tribunal (NGT) and laws just like the EPA, guarantees the recovery of infected groundwater as well as compensation for financial and fitness losses. criminal legal responsibility discourages violations, specially for point-source polluters like tanneries and chemical flora, with consequences along with 1.5–7 years in jail underneath the Water Act and as much as five years below the EPA. The 2025 contaminated websites guidelines in addition give a boost to deterrence by way of classifying willful contamination as non-bailable in severe instances, with fines up to ₹10 lakhs.

despite these strengths, the framework's efficacy is hampered with the aid of systemic demanding situations. uneven enforcement across states, with handiest 30% of over 7,000 groundwater blocks monitored, limits responsibility. excessive evidentiary burdens and rare criminal prosecutions most effective 15% of CPCB-said cases main to court cases, undermine deterrence. Corruption, with 20% of consent violations unpunished, and judicial delays, as seen within the 15-year Bichhri case, similarly weaken implementation. The absence of a countrywide groundwater law forces reliance on

fragmented nation policies and trendy statutes, lacking an aquifer-specific awareness.

Groundwater's vital function in assembly 85% of rural drinking water and sixty 5% of irrigation wishes is threatened by way of full-size infection, with 19.eight% of samples exceeding nitrate limits, 9.04% fluoride, and 3.55% arsenic, impacting over 2 million humans with fitness issues like fluorosis and arsenicosis. monetary losses, anticipated at US$ 80 billion yearly, and projected in keeping with capita water availability of one,401 m^3 with the aid of 2025 underscore the urgency for reform.

To deal with those gaps, enacting a unified country wide groundwater law based totally at the version Groundwater invoice (2020) is vital to standardize protections. Strengthening NGT's powers for quicker criminal referrals, adopting actual-time tracking technology like GIS and AI, and improving SPCB capability can enhance enforcement. community-led initiatives, as promoted by using the Atal Bhujal Yojana, and obligatory company environmental audits can in addition ensure compliance. nation-stage advancements, such as Karnataka's 2025 groundwater law, provide a model for stricter duty.

Ultimately, India's legal framework offers powerful tools for polluter accountability, but its success hinges on overcoming enforcement challenges. By balancing civil remedies for restoration with criminal sanctions for deterrence, and implementing targeted reforms, India can protect its groundwater resources, ensuring environmental justice and sustainable development for a water-stressed nation.

REFERENCES

1. Abraham, C M, Environmental Jurisprudence in India, The London Leiden Series On Law, Administration And Development, vol 2 (Kluwer Law International, 1999).
2. Abraham, C M and Armin Rosencranz, 'An Evaluation of Pollution Control Legislation in India' (1986) 11 Columbia Journal of Environmental Law 101.
3. Abraham, Kenneth, 'The Relation Between Civil Liability and Environmental Regulation: An Analytical Overview,' (2002) 41 Washburn Law Journal 379–398.
4. Ackerman, Bruce A and Richard B Stewart, 'Reforming Environmental Law: The Democratic Case for Market Incentives' (1988) 13 Columbia Journal of Environmental Law 171.
5. Anderson, Michael, 'Public Nuisance and Private Purpose: Policed Environments in British India 1860–1947' (1992) 1 SOAS Law Department Working Series Papers 1–39.
6. Anderson, Michael and Paolo Galizzi, (eds) 'International Environmental Law in National Courts' (British Institute of International and Comparative Law, 2002).
7. Atiyah Curmally, 'Environmental Governance and Regulation in India' Indian Infrastructure Report 2002 96.
8. Bates, R, 'Water Pollution Prevention: A Nuisance Approach' (1994) 14(3) Economic Affairs 13.
9. Betlem, Gerrit and Edward Brans, 'The Future Role of Civil Liability for Environmental Damage in the EU' in Han Somsen et al, (eds) (2002) 2 Yearbook of European Environmental Law 183–221.
10. Dias, R W M, 'Trouble on Oiled Waters: Problems of the Wagon Mound (No 2)' (1967) 25(1) The Cambridge Law Journal 62.
11. Divan, Shyam and Armin Rosencranz, Environmental Law and Policy in India: Cases, Materials And Statutes, 2nd edn (Oxford University Press, 2002).
12. Garg, M R and N S Tiwana, 'The Water (Prevention and Control of Pollution) Act: A Case for Amendments to Make it More Effective' in Paras Diwan and Peeyushi Diwan, (eds) Environment Administration, Law and Judicial Attitude (Deep and Deep Publications, 1992) Chapter 27.