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Strict Laws, Weak Results: Why Illegal Hazardous Waste Dumping Continues in India

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***Abstract*—The dumping of hazardous waste and unregulated chemical leakage and emissions continue to pollute the air, water and soil in India. This is surprising, considering that there is a developed liability system by Indian courts based on three basic principles: absolute liability, the polluter pays rule, and the precautionary principle. Commonly, the weak enforcement of regulations is regarded as the cause, but it does not explain the lack of any real impact of such rigorous norms on companies' practices. The chapter consists of four parts. The first section covers some laws and judicial decisions which have influenced the liability regime in India. The second part explains the division of boxes of air, water and land pollution, and the dichotomy of legal/illegal which underlies the current laws. The third section takes a law-and-economics perspective and shows why there is a rationale for companies to violate the law. The last section employs the Bhopal case to illustrate how liability can be transferred from one jurisdiction to another. Delay, jurisdictional loopholes, various statutes and inequities are treated as separate issues in the present research. However, this chapter considers them to be causes which mutually help enhance one another. The methodology used is doctrinal (i.e., law and judicial rulings related analysis) with some backing economic and socio-legal reasons, in accordance with the second source of information. The current work is not based on any field data and the comparison is made with only one foreign country. It concludes that the biggest unspoken problem with Indian hazardous waste legislation is not so much the standards of liability as the mechanisms of imposing liability.**

***Index Terms*—Absolute liability, Environmental federalism, Environmental justice, Forum non conveniens, Hazardous waste, Polluter pays principle**

I. INTRODUCTION

The concept of hazardous waste law is a mystery in India. The hazardous waste law is one of the most complex in Indian law and the Supreme Court's judgments based on the concept of "absolute liability" and "the polluter pays" principle and "precautionary principle" have been of great

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importance.[1] But its sophistication has its own drawbacks, as this area of Indian law is infamous for its violation, and such incidents as unlawful dumping of industrial wastes and unchecked chemical discharges have been reported in various parts of India decades after its inception.

Typically, the usual explanation for the situation is weak enforcement. Pollution Control Boards lack adequate resources, and there is a lack of political will to deal with the issue. This explanation tends to treat the non-compliance issue as a matter that lies outside of the legal system. In this paper, a contrary point of view is put forward: the structure of the legal system itself contributes to non-compliance with the law. This can be illustrated through the four connected conditions of the persistent existence of a particular industrial geography, fragmentation of laws and legal categories, rational economic non-compliance, and simplicity of moving liability between jurisdictions.

One of the factors that cause the problem is attributed to a proper definition. Most of the literature on the Indian hazardous waste law has been written in a medium-to-medium way, covering air pollution under the Air Act in one publication, the water pollution under the Water Act in another piece, and waste management under the 2016 Rules in yet another piece as if they are distinct fields. A single factory may comply with air emission requirements, violate its water discharge limits and not take preventive measures against soil contamination at all, it is basically working one at a time and not working in a collaborative manner.

This paper argues that while environmental contamination is an ongoing process that often begins and ends before anyone has noticed, the law relates only to discrete events. This difference between a continuous process and an event is what links the doctrinal, economic, and jurisdictional issues being discussed in this paper. Our approach is different from the vast majority of available commentary. Typically, such commentary prefers to call for tougher standards and harsher punitive damages or additional prohibitions. Such recommendations are useful to a certain extent but are primarily concerned with the severity of punishment. What is more serious is that the underlying problems are elsewhere. The main issues include the probability of the offense being detected in the first place, the time that passes since its detection for the case to be resolved and the responsibility fulfilled, as well as how easily it is possible to move liability from one legislation or institution to another. The organization of the paper is based on the discussion of these structural problems by applying real cases.

The paper sets out to: (1) study the theoretical basis for hazardous waste liability with a specific focus on strict liability as well as the 'polluter pays' principle and the precautionary principle; (2) assess the difference between regulations for air, water, and soil and the distinction between legal and illegal actions; (3) use law-and-economics as a tool to explain the reality of illegal dumping despite stringent legislation; (4) evaluate fairness and jurisdictional aspects of hazardous waste liability through comparative and sociological approaches.

Research Questions. (a) Is Indian legislation sensitive to the fact that hazardous harm normally manifests long after the action which caused it? (b) Is the separation of the regulation of air, water,

[1] M.C. Mehta v. Union of India, (1987) 1 SCC 395 (India); Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647 (India); Indian Council for Enviro-Legal Action v. Union of India, (1996) 3 SCC 212 (India).

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

and soil creating loopholes that can be exploited? (c) Is illegal dumping rational non-compliance with legislation in the current conditions of enforcement? (d) Does the federal structure of India along with legal principles such as forum non conveniens facilitate shifting of liability undermining the standards established by the judiciary?

II. RESEARCH GAP

The topic examined here draws on three bodies of research which have developed separately. The doctrinal commentary on absolute liability, polluter pays and precautionary principle is clear about the standard of liability but seldom discusses the timing and jurisdictional conditions of the enforcement of the standard. Law and economics research, notably Gary Becker's idea that crime is an economically rational response to the risk of apprehension and severity of punishment, is widely used in research on corporate wrongdoing.[2] Its application to the issue of hazardous waste in India has hardly been done. Environmental justice research based on Robert Bullard's argument that polluting enterprises are located in disadvantaged racial communities has created a vast literature on who is responsible for pollution.[3] In India, environmental justice research has been conducted in terms of caste and informal labor, and has not much to do with the colonial history of industrial siting and liability studies.

The gap that this paper is filling is that in the previous literature there was no single study that integrated these three areas with the less studied issue of jurisdictional mobility. In the paper, all four are looked at as interrelated approaches to the issue of illegal hazardous waste dumping in our country.

III. RESEARCH METHODOLOGY AND LIMITATIONS

The methodology will follow the doctrinal legal method while the entire doctrinal analysis will be supported by law and economics as well as socio-legal analysis of the materials used. Sources used are of two kinds. The first is the primary legal sources, which include Supreme Court judgments that constitute the framework of the law of environmental issues in India, the main legislation and regulations that resulted from it, as well as one judgment of a foreign court relevant for jurisdictional issues of environmental damages done in India.[4] The second type includes the secondary sources consisting of both peer-reviewed studies and institutional materials on work in hazardous conditions in informal sector and the colonial past of the industrialism in India.

There are three limitations to the study. Firstly, the research does not contain any new field data. The socio-legal conclusions made in the paper are based on previous research that has not been validated. Secondly the comparison is limited to one foreign country, namely the US, and one type

[2] Gary S. Becker, Crime and Punishment: An Economic Approach, 76 J. POL. ECON. 169 (1968).
[3] ROBERT D. BULLARD, DUMPING IN DIXIE: RACE, CLASS, AND ENVIRONMENTAL QUALITY (1990).
[4] In re Union Carbide Corp. Gas Plant Disaster at Bhopal, India in Dec. 1984, 634 F. Supp. 842 (S.D.N.Y. 1986), aff'd as modified, 809 F.2d 195 (2d Cir. 1987), cert. denied, 484 U.S. 871 (1987).

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

of legal dispute and finally the legal analysis is restricted to documented appellate judgments only which can leave out many relevant non-documentaries first level judgments that contribute to the study.

IV. STATUTORY AND DOCTRINAL FRAMEWORK

The Statutes

Hazardous waste management is not captured by one legal system in India. There are two sanctioned policies in the type of the Water (Prevention and Control of Pollution) Act, 1974[5] and the Air (Prevention and Control of Pollution) Act, 1981,[6] each of them operated by State Pollution Control Boards constituting different legal frameworks. The Environment (Protection) Act, 1986[7] was created as a basic law of environmental nature in the aftermath of the Bhopal disaster with extensive powers granted the Central Government to formulate rules. Following the provisions of sections 6, 8, and 25 of that Act;[8] in 2016 there appeared Rules relating to Hazardous and Other Wastes (Management and Transboundary Movement) which actualize the Basel Convention in India[9] and place obligations of authorities, storing and transporting the hazardous waste on the "occupier" of the hazardous waste, the occupier being alongside the importer, exporter, and disposal facility operator responsible for damages caused by the poor treatment of waste[10] Rule 15 allows treating unauthorized imports, lying for proceeds, and dumping in violation of the Basel Convention as criminal acts.[11] The scale of the problem is huge. According to the documentation by the Central Pollution Control Board, over 7.46 million tons of hazardous waste are generated every year by more than 43,000 sources of units.[12]

Criteria established by the court

Public interest litigation has given rise to the liability standard established by the three cases briefly explained as they are of importance not because of the judgments themselves but because of the subsequent developments in this area.

M.C. Mehta v. Union of India (1987) followed the oleum gas accident in the Delhi fertiliser plant, establishing that companies engaged in dangerous activities were subject to an absolute liability

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[5] The Water (Prevention and Control of Pollution) Act, 1974, No. 6 of 1974 (India).
[6] The Air (Prevention and Control of Pollution) Act, 1981, No. 14 of 1981 (India).
[7] The Environment (Protection) Act, 1986, No. 29 of 1986 (India).
[8] The Environment (Protection) Act, 1986, §§ 6, 8, 25 (India).
[9] The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 (Notified on Apr. 4, 2016) (India).
[10] 2016 Rules, supra note 9, Rule 4(2).
[11] 2016 Rules, supra note 9, Rule 15.
[12] L. Karthikeyan et al., The Management of Hazardous Solid Waste in India: An Overview, 5 ENVIRONMENTS, no. 9, art. 103 (2018) (reporting around 7.46 million metric tonnes of hazardous waste generated from 43,936 industries, citing ASSOCHAM & PwC, Waste Management in India: Shifting Gears (2017)); cf. Central Pollution Control Board, National Inventory Report on Hazardous Waste Generation and Its Management (2016-17), § 4.1 (Issued in Oct. 2018) (reporting about 7.17 million metric tonnes from 56,350 industries).

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

without the possibility to delegate it to anyone, and liability would arise once damage has occurred regardless of negligence and third parties.[13]

Vellore Citizens Welfare Forum v. Union of India (1996) established the principle of "polluter pays" and "precautionary principle" in Indian law and put the burden of proving that the activity of the industry is safe on the industry instead of the community.[14]

Indian Council for Enviro-Legal Action v. Union of India (1996) established the liability of chemical manufacturers for untreated hazardous waste and the closure of plants ordered with their assets attached together with estimating the costs for the government.[15] All these three cases together suggest that Indian courts are already establishing some of the most complicated liability principles in favour of polluters.

Permitted Pollution is still Pollution

When the discussion picks up as regards the "illegal pouring," it tends to regard this issue as something totally different from the allowed discharge. The data from the court gives a different story. The case studied in Vellore evolves around tanneries that discharge effluents that cannot be whitewashed from an environmental perspective, but they all have permission to work.[16] The issue, thus, lies in that the tanneries do contribute to the pollution through allowed activities that are done under improper conditions. The court settled the matter by putting the burden of proof on the industry and deciding not to view government consent as proof that any activity is environmentally friendly.

Air, water, and soil are isolated issues: This situation is aggravated by the fact that prior to 2016, there was no dedicated preventive regime for soil contamination which would be similar to the consent systems for air and water. The Rules 2016 concern the hazardous waste management, but they definitely do not represent a full-fledged separate system for regulating the contamination of the land.

In essence, this means that one factory may be fulfilling its obligations under the Air Act but has committed a breach of the Water Act, yet there are no restrictions preventing it from causing soil pollution. But, in practice, pollution cannot be treated in such an isolated way as it constitutes a process going from one medium to another in a chain of cause and effects. As a result of such separation, pollution cases fall under different regulators that exist in most instances independently of each other within their legislation framework.

This separation can also be observed in courts : The same distinction can be traced at the level of adjudication as the National Green Tribunal's jurisdiction is based on seven laws having been named exhaustively:[17]

[13] M.C. Mehta, supra note 1.
[14] Vellore Citizens' Welfare Forum, supra note 1.
[15] Indian Council for Enviro-Legal Action, supra note 1.
[16] Vellore Citizens' Welfare Forum, supra note 1.
[17] The National Green Tribunal Act, 2010, No. 19 of 2010, § 14(1) & sched. I (India).

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

1. The Water Act, 1974;
2. The Water Cess Act, 1977;
3. The Forest (Conservation) Act, 1980;
4. The Air Act, 1981;
5. The Environment Protection Act, 1986;
6. The Public Liability Insurance Act, 1991; and
7. The Biological Diversity Act, 2002.

Therefore, for the case to fall under the jurisdiction of the tribunal, the claim in question must arise from one of the legislations mentioned above. However, the wide-ranging legislative mechanism designed to close the medium by medium split in law has eventually inherited the split which has become its own limit of the powers as it does not entertain the cross-media contamination as a single cause of action while filing the suit.

V. THE LEGAL/ILLEGAL DIVIDE AND REGULATORY FRAGMENTATION

Indian pollution legislation classifies actions into two categories. A facility operating under its permits is regarded as legal. However, a facility emitting, releasing, or discharging beyond its limits is classified as illegal. The same criteria apply to both situations. For instance, Schedule II of the 2016 Regulations views waste as hazardous once its leaching mercury reaches a level of 0.2 mg/l.[18] This way of drawing distinctions leads to two important implications for this paper.

The first implication is that compliance is reduced to the issue of limits rather than to the question of harm. Thus, a permit controls what goes out of a pipe on that specific date but does not consider the accumulation of pollutants in the soil and groundwater for a ten-year period. Thus, a facility may be below its limits while continuously contributing to an unsolved environmental problem. The limitations, however, are not consistent across the board. For example, in Vellore, it was submitted before the Supreme Court by the expert body NEERI that definitive standards for total dissolved solids, sulphates and chlorides for water discharge into inland surface waters have not been set by the Union Ministry and that it is for the respective State Boards to decide.[19] In a nutshell, the box is defined by different entities in different States.

The second impact is that one illegal action is per se considered one incident that needs to be proved. The authority is obliged to prove that a specific person dumped a specific type of waste at a specific time and place. For instance, in Bichhri, the units spread sludge over a large area, covered it with soil and counter charged another public sector unit for the wrong doing. Only after the Supreme Court received numerous reports from NEERI, a central team of experts and the State Board could it finally point its finger only to the respondents.[20] Regular inspections cannot provide this type of evidence. The appearance of the waste from any facility is linked to its characteristics. The 2016 Regulations do not cover waste water or flue gases as these categories fall under the

[18] 2016 Rules, supra note 9, sched. II.
[19] Vellore Citizens' Welfare Forum, supra note 1.
[20] Indian Council for Enviro-Legal Action, supra note 1.

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

jurisdiction of the Water and Air Acts, respectively. In other words, a body could not secure a regulatory permit in accordance with the regulations unless it has received the necessary approvals as provided by the two acts. Thus, the facility has several permits, making several submissions in lines with all the authorities without one document providing anything comprehensive. The Environment (Protection) Act was intended to solve this issue. The very title of the Act states that existing regulations were applicable only to certain pollution types and specific pollutants, the connections between them were weak, and many authorities were involved in the regulation process, while the Supreme Court added that there was no authority established in compliance with point 3.3 of the Act, and its functions were fulfilled by the court.[21]

Fragmentation exists not only in terms of federalism in this particular timeframe but also in the context of time. For example, pollution regulation is categorized under the State subject, prompting the Parliament to enact the Water Act pursuant to resolutions made in the State legislatures under the provisions of Article 252[22] where the amendments will apply only once they are adopted by a State. In the Bichhri ruling, it states that the amendment of 1988 was enacted by Rajasthan on May 9, 1990, while the State Board confirmed that there was no power to close any industry until recently.[23] The said industry contended that they were established prior to the amendments, therefore, there was no consent that needed to be acquired.

Absolute liability does not make distinctions about which category an industry falls under. The Supreme Court used the same principle regarding Oleum, where the plant owner has not violated any rules, and in Bichhri, where it obviously did violate the law.[24] Nevertheless, mechanisms used to identify and catch the polluter such as consent, inspection, closing and prosecution still apply considering legal/illegal investments.

VI. THE MISMATCH BETWEEN LEGAL TIME AND ENVIRONMENTAL TIME

Illegal disposal of hazardous waste creates a significant problem for the environmental legislations since it has immediate adverse impact. On the other hand the official identification of the offence, the parties responsible for the same, and its legal retification can take much longer. Hazardous wastes may include corrosive, toxic, reactive or other such substances that pose a health risk when they get contaminated with water, air, surface water, or soil.[25] Waste disposed at an unlicensed dumping yard can remain in the environment for years and slowly impart away from the dumping area. Thus, it allows a prolonged period of time lag between environmental harm and its legal cognizance.

The law ascertain illegal dumping through the statutory requirements, permits, the prescribed mechanism for disposal, environmental standards and other regulatory conditions. However, the

[21] The Environment (Protection) Act, 1986, § 3(3) (India).
[22] India Const. art. 252.
[23] Indian Council for Enviro-Legal Action, supra note 1.
[24] M.C. Mehta, supra note 1; Indian Council for Enviro-Legal Action, supra note 1.
[25] 2016 Rules, supra note 9, Rule 3(1)(17).

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

environmental damage does not begin at the moment when the authorities identify it. In majority of the cases, the hazardous waste is already contaminated in the local surrounding and environment before the illegal disposal is identified and before the legal cognizance is taken upon.

According to the regulatory framework in India, the primary responsibility for hazardous waste is upon the waste generators and handlers. The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 are made under the Environment (Protection) Act, 1986 which stipulates a systematic approach to waste management for the waste generators and handlers. It provides the hierarchy for the prevention of waste production, minimizes reusing, recycling waste, utilization from the waste materials and safe disposal of the same. Rule 4(2) and (3) of the said 2016 rules makes the occupier liable for safe disposal of waste at authorized disposal facility.[26] Thereby reducing the negative impact of hazardous waste on the environment.

Research Foundation for Science, Technology and Natural Resource Policy v. Union of India, has highlighted the issue of dumping of hazardous waste.[27] The Supreme Court expressed the concern regarding the situation occurred after dumping of hazardous waste as alarming since it triggers to cause serious and irreversible environmental damage especially to the flora and fauna. Therefore, it directed the measures regarding illegal dumping sites for hazardous waste and asked to prepare a inventory and rehabilitation mechanism.

Another major and complex problem is that the regarding the distinction among the detection and identifying the source of the contamination. A surrounding, which is contaminated, may have multiple possible sources especially in the industrial areas wherein various industries may generate huge amount of hazardous waste. In such circumstances, the authorities are required to track the movement of the waste and substantiate the relationship between the waste dumped at a particular site and specific generator, transporter, occupier of the waste or disposal facility. It involves distinct elements to look for such as, identity, origin of the waste, the transporter, composition of such waste, sequence of the events and causation of contamination. Thus, the longer the time lapses between the disposal and detection, the more challenging it becomes for the reconstruction.

Once contamination has been identified, the challenge is far from over. Another difficulty is proving the violation and uniting the perpetrators. Scientific investigations are needed to resolve the nature, concentration and extent of the contamination and to elucidate the possible source of the contamination. Laboratory tests can help identify a specific dangerous material, but may not determine when or by whom it was disposed. If multiple industrial establishments are dealing with the same materials, the authorities may have to review industrial production records, waste-generation records, transportation records, waste manifests, authorizations, waste-disposal records, and environmental-monitoring reports to determine where the contamination is coming from.[28]

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[26] 2016 Rules, supra note 9, Rule 4(2)–(3).

[27] Research Foundation for Science, Technology & Natural Resource Policy v. Union of India, W.P. (C) No. 657 of 1995, ¶¶ 2, 42–43, 70.1, 70.4 (Oct. 14, 2003) (India).

[28] Wenxi Liang et al., How to Track the Dumped Waste? From Data Collection to Advanced Source Identification, 499 J. HAZARDOUS MATERIALS 140052 (2025).

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

The complexity of environmental science further complicates establishing liability in a hazardous-waste case. Sometimes contamination can be caused by a combination of events. In many instances it's a gradual progression over the course of multiple activities. The amount of concentration of any pollutant may also vary when the pollutant is transported by soil, water or air. Chemicals may also experience physical or chemical changes after entering the environment and there may be chemicals in the waste at the time of disposal. These may make it challenging to make a direct connection between the waste at a contaminated site and the waste that was originally produced by a specific occupier.[29]

VII. MOVING LIABILITY ACROSS BORDERS: A COMPARATIVE LOOK

The issue of hazardous waste disposal due to illegal dumping is a significant problem for environmental governance, since the generation, transports and disposal of these wastes can be carried out by a variety of persons, companies and jurisdictions. It becomes challenging when hazardous waste surpassed national boundaries. In such cases, the landfill nation may suffer the environmental damages and health effects, even though the waste has originated somewhere else or been transported from some different country. Meanwhile, the commercial benefits will remain with the establishment or industry involved in such transaction.

The international law relating to environment recognizes the difficulties regarding transboundary movement of hazardous waste, however establishing a legislative framework is not the same as ensuring the responsibility that can be effectively enforced. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal provides an international framework for regulation of such movements and response to illegal traffic of hazardous waste.[30] The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, are the rules that govern the transboundary movement and import and export of hazardous waste in India, with the objective of preventing unauthorized transboundary movement and disposal of hazardous waste. Whereas the presence of these rules does not remove the practical challenges of controlling cross-border waste transactions. For example, if an Indian facility receives a consignment which is declared as a recyclable material, the authorities will need to evaluate whether the material is really for recycling purposes, if required permissions are being received and if the receiving facility is authorized to process the material. The investigation may be complicated if important records are located with foreign suppliers or intermediaries and cooperation with other countries' authorities is required to trace the transaction and determine the responsibility of the parties who facilitated its illegal transport.

[29] Liang et al., supra note 28.
[30] Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 57.

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

By contrast, the United States has two complementary federal laws addressing hazardous waste management, the Resource Conservation and Recovery Act (RCRA)[31] and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[32] – otherwise known as Superfund – that specifies the procedures for cleanup of contaminated sites and the recovery of costs. This distinction is important as an illegal dump could include the violation of waste-management conditions and the contamination of the environment that will persist even after the individual or company responsible for the dumping has stopped. The Superfund provisions allow the government to take action to clean up contaminated sites and then try to recover the costs from those who caused the contamination (such as sites contaminated in the past). But it also has its drawbacks. As long as the responsible parties cannot be determined or made liable for the costs, it is possible that public funds will still be needed for the cleanup.[33]

The major issue is not only to stop the unauthorized dumping of hazardous waste but to ensure that those who are responsible are accountable for causing the environmental harm. Both the Indian and the US frameworks provide the provisions for enforcement, remediation, and decontamination but only if they can be effectively implemented. There is an improved relationship between regulatory action and timely cleanup of environment and the cost of recovery, which is crucial. Whilst the legislation is established, nevertheless there is no effective implementation, polluters may not suffer the consequences of illegal dumping. It is the affected community and public authorities who bears the burden of environmental damages.

Given the circumstances, the precautionary principle becomes very significant, taking into consideration the Vellore Citizens' Welfare Forum v. Union of India,[34] When there is a high risk of serious or irreversible environmental damage, then it shall not be necessary to wait for the complete scientific justification to prevent the environmental damages. The Court also emphasized the importance of the burden of proof in environmental cases. However, it is also recognized that to wait until all the aspects and causes of contamination are verified before taking preventive actions, it has allowed the contamination to become worse and possibly irreversible.

VIII. A LAW-AND-ECONOMICS READING OF NON-COMPLIANCE

According to economists, violating the law can be viewed as a decision. In his article from 1968, Gary Becker asserted that a person commits a crime when he/she thinks that the expected benefit from the act exceeds the expected costs.[35] Further, Polinsky and Shavell developed a complete theory concerning public enforcement that included three components: the probability of

[31] Resource Conservation and Recovery Act of 1976, Pub. L. No. 94-580, 90 Stat. 2795 (codified as amended at 42 U.S.C. §§ 6901–6992k).
[32] Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Pub. L. No. 96-510, 94 Stat. 2767 (codified as amended at 42 U.S.C. §§ 9601–9675).
[33] Comprehensive Environmental Response, Compensation, and Liability Act of 1980 §§ 106–107, 42 U.S.C. §§ 9606–9607.
[34] Vellore Citizens' Welfare Forum, supra note 1.
[35] Becker, supra note 2.

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

punishment, its magnitude, and the liability rule.[36] Taking the case of a corporation, it is important to note that it can be easily analyzed without assuming that its leadership is composed of bad people. The only thing we need to do is compare two options for transporting one drum of sludge. The legal option involves many steps. In accordance with the Rules of 2016, the facilities must deliver the waste to an authorized person, keep it for less than 90 days unless the Board allows for the longer term of storage, package and label it properly, deliver it together with a manifest, obtain the No Objection Certificate from two Boards if the waste is sent to another state for disposal, and maintain records and file annual reports.[37] Every action incurs expense, whether it is time or money expenditure. Illegal methods circumvent the cumbersome process. Disposing of the entire tank's contents into a ditch or the countryside is not more expensive than travelling the legal route.

The next question is the likelihood that the illegal method can come to an end. The system depends to a large degree on how much the operator is ready to reveal about its activities. To renew the licenses, the operator is required to provide a self-assessment report and annually submit its return. The Central Pollution Control Authority's inspection of the operation has to be conducted "from time to time."

However, the data shows that in 2015, nearly 44,000 producing enterprises generated 7.46 million tons of hazardous waste per year. An unlawful dumper does not have to submit anything, so this absence does not indicate anything. It is not the chances of existence but the possibility of punishment that matters.

However, the State Government did not heed the Board's order to stop its supply of electricity and water, and the unit finally halted operation in January 1989 when protests erupted among the villagers which resulted in an order being issued under section 144 of the Criminal Procedure Code.[38] Then there is the amount of the penalty. After the Jan Vishwas Act came into force in 2023, punishment for a contravention of the Environment (Protection) Act entails paying fines ranging between ₹10,000 and ₹15 lakh, according to the discretion of an adjudicating officer who does not sentence offenders to prison terms.[39] In the case of Bichhri, NEERI calculated the cost of cleaning the area at ₹37.385 crore which is about 250 times the maximum fine.[40] In other words, there does exist a crucial difference between the two mentioned amounts. The first punish the offender while the second has to enable the cleaning process but only if it is going to be applied in practice. On the contrary, breaking the decision of the Green Tribunal may result in being imprisoned for up to 3 years as well as being fined up to ₹10 crore and up to ₹25 crore for companies.[41]

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[36] A. Mitchell Polinsky & Steven Shavell, The Economic Theory of Public Enforcement of Law, 38 J. ECON. LIT. 45 (2000).
[37] 2016 Rules, supra note 9, Rules 4(3), 6(5), 8(1), 18–20.
[38] Indian Council for Enviro-Legal Action, supra note 1.
[39] The Environment (Protection) Act, 1986, § 15(1), as amended by The Jan Vishwas (Amendment of Provisions) Act, 2023, No. 18 of 2023, § 2 & sched. (India).
[40] Indian Council for Enviro-Legal Action, supra note 1.
[41] The National Green Tribunal Act, 2010, supra note 17, § 26(1).

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

The time element comes last. The Bichchari case began in August 1989 and was settled in February 1996.[42] The Supreme Court has said that for 15 years the respondents have been prolonging the matter with one intermediary application after another and thus evading the execution of the judgment.[43] The Court had stated in the beginning of its judgment in 1996 that cases like this make one feel "that law does not have any value.[44]" It had also observed that ordinary criminal court cases do not get resolved and that interim orders paralyze the authorities. One simple example explains why time matters. If a company discounts money at the rate of 10% per annum, the value of the money paid in 15 years' time of ₹37.385 crores becomes approximately ₹8.95 crores today. The discounting rate is given for exemplary purposes only. Courts credit interest also; the 2011 order is said to have been doing it since 1997[45] which minimize the benefit of the delay, yet it remains existent as long as the interest rate remains smaller than what this firm obtains with its money in the meantime.

Economists describe a problem called "judgment-proof" situations. A business that is unable to meet its obligations has little reason to take precautions in the first place.[46] A business can reach a situation like this because it has gone bankrupt or has lost its possessions. The Bichhri plants were run by the same people, and in January 1996 when the State Board came to inspect, two of them no longer existed and there was no equipment.[47] Becker's theory simplifies the issue. Several companies comply with the law or break the law due to ignorance or incompetence instead of doing it intentionally. This paper does not mention the conditions that influence the frequency of illegal dumping in the country, so this information does not tell anything about how many cases of illegal dumping were reported. Even if the penalties are increased for those who break the law, it does not have much effect on them because the chances of getting caught, the speed of implementing the punishment, and the reliability of collecting fines are much more influential factors.

IX. WHO BEARS THE BURDEN: ENVIRONMENTAL JUSTICE AND INHERITED INDUSTRIAL SITING

Industries that are situated near villages, agricultural land, rivers or groundwater sources are tend to continuously affect the surrounding population even after their operations have changed or come to an end. Hazardous waste when dumped illegally in such ares, the communities which are affected have no contractual relationship with polluter. Thus, locally surrounded communities are often the ones who bear the huge consequences of the resulting environmental damages. Thereby,

[42] Indian Council for Enviro-Legal Action, supra note 1.
[43] Indian Council for Enviro-Legal Action v. Union of India, [2011] 9 S.C.R. 146, ¶ 25 (July 18, 2011) (India).
[44] Indian Council for Enviro-Legal Action, supra note 1; see also Indian Council for Enviro-Legal Action, supra note 43, ¶ 3 (quoting the 1996 judgment: "And the law seems to have been helpless.").
[45] Indian Council for Enviro-Legal Action, supra note 43.
[46] Steven Shavell, The Judgment Proof Problem, 6 INT'L REV. L. & ECON. 45 (1986).
[47] Indian Council for Enviro-Legal Action, supra note 1.

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

the monitory benefits of industrial activity go to the one group, while the cost of environmental damages is imposed on another.[48]

Bhopal gas leak tragedy shows how people may continue to bear the consequences of industrial decisions long after production has stopped.[49] The local residents cannot without assistance control the management of an abandoned industrial site, determine the appropriate disposal technology or ensure that decontamination is completed. Though they may remain dependent on local land and water resources while the authorities and legally responsible persons address the contamination. Thus, it demonstrates the unequal relationship between those who are authorized for industrial activity and those who bear consequences of environmental damage.

Another issue is the labeling of hazardous waste as recyclable materials or substances that are recoverable. Recycling, resource recovery are reasonable activities provided done within the framework of applicable laws and environmental protections. But the mere fact that waste is to be recycled does not imply that the management or disposal process is safe and legal. Where the actual nature of a consignment or its intended destination, or the planned treatment, is different to what is declared, the authorities should determine whether the activity is an actual recovery of resources or attempted (or actual) illegal disposal.

If inspections are mainly about whether the forms are filled in, but not whether the quantities recorded are correct, then documentation will only be a formality. In these types of situations, records might generate the impression of regulatory adherence yet not provide for accountability. The Central Pollution Control Board (CPCB) acknowledges non-observance of any record keeping or reporting as violation of regulation and more stringent course of action may be taken in case of any environmental damage caused due to improper waste management.[50]

X. SUGGESTIONS AND RECOMMENDATIONS

The following are four recommendations. Each one offers a solution to the structural issue described in the prior discussion. They do not call for an increase of liability standards, because in the opinion expressed in this paper the courts already established the standards high enough.

The introduction of escrow remediation bonds. Before a waste facility starts to handle hazardous waste, it has to provide a bond corresponding to the quantity and hazard class. The Board will hold the bond and release it only if the site is declared clean at the end of its operation, which deprives a firm of the advantage of delay, as it could no longer enjoy years of litigation (Part VIII). This concept is not new and it is already present in the Rules. The application Form 1, which every applicant is to fill out when applying for the permit, already asks for a commitment assuming the

[48] Pratyusha Basu & Jayajit Chakraborty, Environmental Justice Implications of Industrial Hazardous Waste Generation in India: A National Scale Analysis, 11 ENV'T RSCH. LETT. 125001 (2016).

[49] Yashaswini Mittal, Role of Indian Regulatory Authorities in Integrating Environmental Justice into Industrial Siting Decisions, 10(2) NUJS L. REV. (2017); Union Carbide Corporation v. Union of India, AIR 1990 SC 273 (1989) (India).

[50] 2016 Rules, supra note 9, Rules 20–21.

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

obligation of providing a bank guarantee in case there are any spillages, leakages or fires.[51] Thus, the innovation suggested here is bringing the guarantee into the realm of the authorization under rule 6(2).[52] The Public Liability Insurance Act of 1991 provides for compulsory insurance for accidents, accompanied by an Environmental Relief Fund.[53] It occurs that the given Act is based on the definition of "accident," which refers to an unforeseen, sudden, or unintended incident, which does not fit the definition of intentional dumping.[54] The gap is warranted by having a bond. Shavell explains that the answer to the judgment-proof issue should consist of minimum asset requirements and the obligation to have insurance.[55]

One of the issues related to cross-media damage and proper ticking clock. The Tribunal Act defines the environment as water, air, land, and their interconnectedness allowing the Tribunal to allocate liability among various sources in case of combined damage.[56] However, the limits of the Tribunal jurisdictions are outlined by seven Acts, as demonstrated in Part IV. The Central Government is empowered to extend the list of Acts through notification, whereas the Act says that the claims should be examined based on the Acts included in the list.

The time limits should be given equal importance. A complaint must be filed anytime during 6 months and the claim for compensation or restoration must be filed within 5 years of the date of occurrence of the cause of action, with a grace period of 60 days in both cases.[57] The Supreme Court has classified the two provisions into separate categories having independent time frames.[58]. Pollution is usually detected later in time. The Act should provide for the computation of time only from the time of realization of the harm done.

Common tracking mechanism for all states. The 2016 Rules provide, at the time of issuance, for the issuance of a manifest of 7 copies of various colors to be in the possession of various regulators, including the sender and the receiver Boards and the NOCs from both the States against disposal in any State.[59]. This results in the information dispersed among various regulatory authorities. The Central Pollution Control Board has since then come up with guidelines for online hazardous waste manifest. The premise is to develop a single electronic manifest that would function as an official account under the relevant legislation. This record should be accessible to all Boards along the way and it would send out alerts if there is a discrepancy between the amount transported and that received (in the USA a national e-Manifest system was established under the law enacted in

[51] 2016 Rules, supra note 9, Rule 6(1) & Form 1.
[52] 2016 Rules, supra note 9, Rule 6(2).
[53] The Public Liability Insurance Act, 1991, No. 6 of 1991, §§ 4, 7A (India).
[54] The Public Liability Insurance Act, 1991, supra note 53, § 2(a).
[55] Steven Shavell, Minimum Asset Requirements and Compulsory Liability Insurance as Solutions to the Judgment-Proof Problem, 36 RAND J. ECON. 63 (2005).
[56] The National Green Tribunal Act, 2010, supra note 17, § 2(1)(c).
[57] The National Green Tribunal Act, 2010, supra note 17, §§ 14(3), 15(3).
[58] Mantri Techzone Pvt. Ltd. v. Forward Foundation, (2019) 18 SCC 494 (India) (holding that the application raised an independent cause of action under § 15 and was not an application simpliciter under § 14 of the National Green Tribunal Act, 2010).
[59] 2016 Rules, supra note 9, Rules 18(3), 19.

e-ISSN: 2839-5786, p-ISSN: 3139-8464 | JATIR

2012)[60]. Such a common system would help solve the problem described in Part VIII since what is missing would be indicated by the gap in the records instead of silence.

Bring informal workers into the scope of hazardous waste legislation. A considerable amount of hazardous waste goes into informal workshops. A study of 220 informal workers in electronics in Seelampur and elsewhere in Delhi showed that only 12 percent of them had any kind of protective gear.[61]

In 2026, the media reported that there were 322 licensed e-recycling companies in the country and researchers were estimating that the informal sector handled nearly 95 percent of electronic waste.[62] The rules assign part of the responsibility to State governments. The Industry department is responsible for ensuring recycling facilities exist, and the Labour department is to register workers in the field, help them to form groups, train them, and monitor their safety and health every year. The plan of the State and its annual report that have to be presented at the Centre are optional as per rules of 2016, r. 5.[63] It is necessary to make that report compulsory, have it published, and make it connected to the risks from the generator. Premises already bear responsibility for harm caused by poor waste treatment, therefore, there is no need for stopping waste at the entrance of the facility. E-waste follows this path with the purchase of producer responsibility certificates from the recyclers that are registered and needs for registration of workers.[64] This approach should be followed in case of other industrial waste.

XI. CONCLUSION

This paper opened with a riddle. Courts in India have established some of the most stringent liability criteria concerning hazardous industries, yet illegal dumping and unregulated disposal still takes place. The common response is weak enforcement, but the paper has asserted that it is just a piece of the puzzle, and that the nature of law is crucial in understanding the rest. The legal system operates in two realms, legal and illegal, comparing compliance against forms and limits. The waste from a single factory is divided into different kinds, such as air, liquid, soil, and hazardous waste and each kind has its own permit, regulatory officer, and legal structure. The legal system works based on isolated events, such as dumping, complaining, or convicting, while pollution is a process that starts unnoticed and continues after the case is closed. The incentives are stacked against the polluter. When something is done the legal way, it is costly, the chances of punishment are slim, and the payments may be made 15 years later or never, and in case the legal option is too expensive, going illegal would seem reasonable. Returning to the study questions, answers come

[60] Hazardous Waste Electronic Manifest Establishment Act, Pub. L. No. 112-195, 126 Stat. 1452 (2012) (codified at 42 U.S.C. § 6939g).
[61] Diksha Singhal, Tanica Lyngdoh & Poormima Prabhakaran, Knowledge, Attitude and Practice Study of Health Risks Among E-waste Recyclers in Delhi, 11 J. HEALTH & POLLUTION, no. 29, art. 210306 (2021).
[62] Raihana Maqbool, 'Daily Cuts… Infections': India's E-waste Workers Face Toxic Health Risks, AL JAZEERA (June 22, 2026), https://www.aljazeera.com/news/2026/6/22/daily-cuts-infections-indias-e-waste-workers-face-toxic-health-risks.
[63] 2016 Rules, supra note 9, Rule 5(1)–(3).
[64] The E-Waste (Management) Rules, 2022 (Notified on Nov. 2, 2022) (India).

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here. Indian law does not say much about the long delay between action and harm, and the time limits in the Tribunal Act are calculated from the moment when the cause of action appears. The division of air, water and soil creates loopholes that can be utilized. It is possible to view illegal disposal as reasonable violation given current circumstances, although there is no data available in this paper to evaluate its prevalence. The federal structure and the movement of waste across the States and borders allows to evade the consequences of injury.

This paper has limitations. No field data is employed, comparison with the USA is made, and the argument is based on the reported appellate decisions from various countries without citing the extent of dissemination of the discussed phenomena.

Despite the above-mentioned limitations, the findings are evident since the courts have already explained what strict liability means. This unfinished work matters in its implementation. There are bonds that eliminate the benefit of deferral, a suit for damage that is transferable between various media, one repository for waste disposal information, and finally we need to think about the laborers who deal with waste. The effectiveness of a firm liability standard depends on the system that allows recuperation.