

# Environmental Law Enforcement in the Citarum River Pollution Case: Lessons from the UK and India

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## ABSTRACT

The Citarum River is a strategic resource for millions of West Java residents, supporting household, agricultural, fishery, and industrial needs. However, heavy pollution from industrial, agricultural, and domestic waste causes ecological damage and threatens the community's fundamental rights to health, clean water, and a healthy environment. This background underlies the importance of studying environmental law enforcement in the Citarum River Basin, considering the close relationship between human rights perspectives and criminal law provisions. This study aims to analyze the effectiveness of environmental law enforcement in Indonesia, specifically in the Citarum pollution case, and compare it with the experience of the United Kingdom in the Thames River case and India in the Ganges River case. The method used is a juridical-normative approach with a comparative approach, through a review of legislation, court decisions, and national and international academic literature. The results show that environmental law enforcement in Indonesia still tends to be administrative and civil, thus not providing an adequate deterrent effect for polluters. In contrast, the United Kingdom has succeeded in strengthening compliance through strict criminal sanctions, while India emphasizes pollution as a violation of citizens' constitutional rights. The conclusion of this study is the need for an integrative model that combines criminal liability with human rights protection, so that environmental law enforcement in Indonesia can be more effective, fair, and sustainable, particularly in efforts to restore the Citarum River.

**KEYWORDS:** *Citarum River; Criminal Law; Human Rights; Law Enforcement; River Pollution.*

## 1. INTRODUCTION

Pollution of the Citarum River has long been a serious environmental issue in Indonesia. The river, approximately 297 km long and a primary water source for domestic, agricultural, and industrial needs in West Java, is often referred to as one of the most

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polluted rivers in the world.<sup>1</sup> Poorly managed textile industry, household, and agricultural waste have drastically declined the water quality of the Citarum River,<sup>2</sup> resulting in severe impacts on public health, ecosystem damage, and disruption to the right to a clean and healthy environment as guaranteed by Article 28H paragraph (1) of the 1945 Constitution and Law Number 32 of 2009 concerning Environmental Protection and Management.<sup>3</sup>

Although various policies have been implemented, including the Citarum Harum program under Presidential Regulation Number 15 of 2018, environmental law enforcement still faces significant challenges. Weak oversight, low deterrent effect on polluters, and overlapping authority between agencies are obstacles to effective law enforcement.<sup>4</sup> This situation raises fundamental questions about the extent to which Indonesia's environmental criminal law instruments can function optimally in addressing pollution in the Citarum River.

Globally, the experiences of other countries can provide valuable lessons. The United Kingdom, for example, successfully restored the quality of the Thames River, which was severely polluted in the 19th century through the implementation of strict regulations, hefty fines against violating companies, and ongoing monitoring by the Environment Agency.<sup>5</sup> Meanwhile, India faces a similar problem, namely the severe pollution of the

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<sup>1</sup> Mariana Marselina, Fachriah Wibowo, and Arini Mushfiroh, 'Water Quality Index Assessment Methods for Surface Water: A Case Study of the Citarum River in Indonesia', *Heliyon*, 8.7 (2022), p. e09848, doi:<https://doi.org/10.1016/j.heliyon.2022.e09848>.

<sup>2</sup> Dian Nur Ratri and others, 'Calibration of ECMWF SEAS5 Based Streamflow Forecast in Seasonal Hydrological Forecasting for Citarum River Basin, West Java, Indonesia', *Journal of Hydrology: Regional Studies*, 45 (2023), p. 101305, doi:<https://doi.org/10.1016/j.ejrh.2022.101305>.

<sup>3</sup> Truly Santika and others, 'Community Forest Management in Indonesia: Avoided Deforestation in the Context of Anthropogenic and Climate Complexities', *Global Environmental Change*, 46 (2017), pp. 60–71, doi:<https://doi.org/10.1016/j.gloenvcha.2017.08.002>.

<sup>4</sup> Lastuti Abubakar and Tri Handayani, 'The Environmental Fund Management Model in Indonesia: Some Lessons in Legal Regulation and Practice', *Environmental Policy and Law*, 53.2–3 (2023), pp. 205 – 217, doi:[10.3233/EPL-230013](https://doi.org/10.3233/EPL-230013).

<sup>5</sup> J Savage and others, 'Just around the River Bend: The Fate of Plastic Bottle Pollution in the Thames Estuary', *Marine Pollution Bulletin*, 220 (2025), p. 118453, doi:<https://doi.org/10.1016/j.marpolbul.2025.118453>.

Ganges River.<sup>6</sup> However, the establishment of the National Green Tribunal (NGT) and the implementation of the Namami Ganges program demonstrate a serious commitment to integrating environmental law with river restoration efforts.<sup>7</sup>

Comparing the Citarum case with practices in the United Kingdom and India is important for identifying the strengths and weaknesses of Indonesia's environmental legal system. Through this comparative study, a more effective law enforcement model with a human rights perspective can be identified, thereby addressing Citarum River pollution while ensuring the protection of the community's right to a healthy environment.<sup>8</sup> Therefore, this research is not only academically relevant but also has practical urgency in formulating a more progressive legal strategy in Indonesia.<sup>9</sup>

Various studies have made important contributions to understanding the dynamics of environmental law enforcement and river pollution management. Astriani et al. (2023) emphasize that environmental law enforcement in the Citarum River faces serious obstacles, particularly lengthy legal processes, high costs, and relatively light sanctions that do not create a deterrent effect. To address these issues, the authors propose the concept of smart enforcement, a more efficient and targeted law enforcement strategy that utilizes technology and provides adequate resource support. This study is relevant because it demonstrates the need for innovation in law enforcement mechanisms in Indonesia.<sup>10</sup> Another study, conducted by Mayangsari et al. (2024), evaluated the effectiveness of fines for environmental violations in the Citarum River watershed. The

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<sup>6</sup> Nupur Soti and others, 'Towards a Sustainable Future: The Interplay of Trade Globalization and Regulatory Quality on Environmental Outcomes in India', *Sustainable Futures*, 9 (2025), p. 100578, doi:<https://doi.org/10.1016/j.sftr.2025.100578>.

<sup>7</sup> Neethi Varadaraja Rao, Varsha Bhaskaran, and Harini Nagendra, 'Can Green Tribunals Help to Resist Neo-Liberalism in Environmental Governance – The Case of India', *Land Use Policy*, 131 (2023), p. 106739, doi:<https://doi.org/10.1016/j.landusepol.2023.106739>.

<sup>8</sup> Ngozi Chinwa Ole and others, 'Chapter 12 - Environmental Laws and Enforcement: Prospects and Challenges', in *Environmental Pollution and Public Health*, ed. by Ronnie Frazer-Williams, Mary B Ogundiran, and Emmanuel I Unuabonah (Elsevier, 2024), pp. 305–26, doi:<https://doi.org/10.1016/B978-0-323-95967-4.00006-4>.

<sup>9</sup> I Juwana, N Muttill, and B J C Perera, 'Uncertainty and Sensitivity Analysis of West Java Water Sustainability Index – A Case Study on Citarum Catchment in Indonesia', *Ecological Indicators*, 61 (2016), pp. 170–78, doi:<https://doi.org/10.1016/j.ecolind.2015.08.034>.

<sup>10</sup> Nadia Astriani and others, 'Identifying the Use of Smart Enforcement in Citarum River Environmental Law Enforcement', *Padjadjaran Jurnal Ilmu Hukum*, 10.1 (2023), pp. 36–58, doi:[10.22304/pjih.v10n1.a3](https://doi.org/10.22304/pjih.v10n1.a3).

results showed that the fines imposed on companies covered only a small portion of the actual costs required to treat industrial wastewater.<sup>11</sup> This indicates a disparity between the environmental damage caused and the amount of penalties imposed. This indicates the weakness of criminal instruments in encouraging compliance among industry players.

Internationally, Acharya Balkrishna et al. (2024) examined the Namami Gange program in India through a study in Water Policy. This program is considered an integrated river management effort, encompassing the construction of waste treatment plants, biodiversity conservation, and increased community participation. This study demonstrates that successful law enforcement and river management are determined not only by strict regulations but also by cross-sector synergy and consistent policies.<sup>12</sup> Riyadi et al. (2020) highlighted the dangers of hazardous waste pollution in the Citarum River. This study emphasized that weak oversight and low awareness among industry players contribute to continued pollution. This study corroborates previous findings that the primary problem lies in weak oversight and law enforcement mechanisms, despite existing regulations.<sup>13</sup>

Meanwhile, Sharma et al. (2021) examined efforts to restore the River Thames in the UK. This study reviewed the long journey of restoring the Thames from a severely polluted state to a healthier river. Key factors for success were strict regulations, severe penalties, water quality monitoring technology, and community involvement. This study provides valuable lessons that river restoration requires a long-term approach with a scientific basis and strong political commitment.<sup>14</sup>

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<sup>11</sup> Miranti Mayangsari and others, 'Assessing Compliance with Environmental Regulations: A Case Study of Fines Imposed on Companies in the Citarum River Basin, Indonesia', *E3S Web of Conferences*, 485 (2024), doi:10.1051/e3sconf/202448503002.

<sup>12</sup> Acharya Balkrishna and others, 'Reuse of Sewage Sludge as Organic Agricultural Products: An Efficient Technology-Based Initiative', *Applied and Environmental Soil Science*, 2024.1 (2024), p. 1433973, doi:https://doi.org/10.1155/2024/1433973.

<sup>13</sup> Bambang Slamet Riyadi and others, 'Environmental Damage Due to Hazardous and Toxic Pollution: A Case Study of Citarum River, West Java, Indonesia', in *International Journal of Criminology and Sociology* (2020), IX <<https://www.cnnindonesia.com/nasional/20190203004645-20->>.

<sup>14</sup> Vasker Sharma, Himanshu Joshi, and Michael J Bowes, 'A Tale of Two Rivers: Can the Restoration Lessons of River Thames (Southern UK) Be Transferred to River Hindon (Northern India)?', *Water, Air, and Soil Pollution*, 232.5 (2021), doi:10.1007/s11270-021-05152-w.

From these five studies, a common thread emerges that river pollution issues are closely linked to the effectiveness of environmental law enforcement. Weaknesses in sanctions and oversight are a significant obstacle in Indonesia, while the UK and India demonstrate more assertive and systematic practices. Therefore, this study seeks to fill this gap by highlighting lessons learned from these two countries to strengthen environmental law enforcement models in the Citarum River Basin. The novelty of this study lies in its comparative approach, linking the condition of the Citarum River Basin to two international cases: the River Thames in the UK, a successful example of restoration, and the Ganges River in India, a parallel case with severe pollution challenges. This comparison allows for more contextualized recommendations, both adapting best practices from the UK and learning from the challenges still facing India. In this way, this study not only strengthens academic studies but also makes a practical contribution to the development of environmental law enforcement strategies in Indonesia.

## 2. RESEARCH METHODS

This research employs a qualitative approach with normative-juridical methods and a comparative study. The normative-juridical approach is used to examine the national legal framework related to environmental law enforcement in the Citarum River pollution case by examining relevant laws and regulations, court decisions, and legal doctrine.<sup>15</sup> This analysis focuses on the application of environmental criminal law as stipulated in Law Number 32 of 2009 concerning Environmental Protection and Management, the Criminal Code, and other legal instruments related to the right to a healthy environment as a human right.<sup>16</sup> Furthermore, this research utilizes a comparative study by analyzing environmental law enforcement practices in the United Kingdom and India, specifically regarding the pollution cases of the Thames and Ganges Rivers. The United Kingdom was chosen due to its extensive experience in restoring the quality of the once heavily polluted Thames River, which has been successfully restored through the implementation of strict regulations, hefty fines, and strict oversight by the Environment Agency. India was chosen

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<sup>15</sup> Yusuf Saefudin and others, 'Empowering the Tri Hita Karana Paradigm for the Community: As an Effort to Prevent and Combat Environmental Crime', *Journal of Law, Environmental and Justice*, 3.2 (2025), pp. 383–416, doi:10.62264/jlej.v3i2.166.

<sup>16</sup> Suparto Suparto and others, 'The Concept of State Control over Forests and Forest Areas in Indonesia', *Journal of Law, Environmental and Justice*, 3.2 (2025), pp. 201–28, doi:10.62264/jlej.v3i2.136.

because it faces a similar problem to Indonesia, namely severe pollution in the Ganges River, but with a law enforcement response through the National Green Tribunal (NGT) and the Namami Gange program.<sup>17</sup> The data sources for this research come from primary legal materials in the form of laws, regulations, and court decisions; secondary legal materials in the form of international and national journal articles, books, and research reports; and tertiary legal materials such as legal encyclopedias and trusted online sources. Data collection techniques were conducted through library research by searching scientific literature, legal decisions, and policy documents both in Indonesia and in comparison countries. Data analysis was conducted qualitatively using a descriptive-analytical model. First, legal data and literature were analyzed to map the pollution conditions and law enforcement practices in the Citarum River Basin.<sup>18</sup> Second, comparisons were made with law enforcement models in the United Kingdom and India to identify similarities, differences, and factors supporting the effectiveness of law enforcement in both countries.<sup>19</sup> Third, the results of the analysis were compared to formulate lessons that can be adopted to strengthen the environmental legal system in Indonesia, particularly in the context of handling Citarum River pollution.

### 3. RESULTS AND DISCUSSION

#### *The Current Citarum River Pollution Situation: Law Enforcement and Human Rights Violations*

The Citarum River, which stretches approximately 297 kilometers and supports the lives of more than 28 million people in West Java and Jakarta, continues to face serious pollution issues despite the Citarum Harum program, which has been running since 2018. The river serves as a source of drinking water, agricultural irrigation, hydroelectric power generation, and industrial support. However, the combination of domestic, agricultural, and industrial activities has made it one of the rivers with the highest ecological pressure

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<sup>17</sup> Rao, Bhaskaran, and Nagendra, 'Can Green Tribunals Help to Resist Neo-Liberalism in Environmental Governance – The Case of India'.

<sup>18</sup> Mayangsari and others, 'Assessing Compliance with Environmental Regulations: A Case Study of Fines Imposed on Companies in the Citarum River Basin, Indonesia'; Astriani and others, 'Identifying the Use of Smart Enforcement in Citarum River Environmental Law Enforcement'.

<sup>19</sup> Savage and others, 'Just around the River Bend: The Fate of Plastic Bottle Pollution in the Thames Estuary', 2025; Rao, Bhaskaran, and Nagendra, 'Can Green Tribunals Help to Resist Neo-Liberalism in Environmental Governance – The Case of India'.

in Indonesia.<sup>20</sup>

Recent data shows some improvement, but not yet significant. In 2024, the Citarum River Water Quality Index (IKA) reached 51.05, categorized as “moderate,” an improvement from 2018, when the value was still in the “poor” range (<40). However, measurements of key pollutant parameters, such as Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD), remain concerning. The average BOD at several points was recorded at 8–12 mg/L, far exceeding the Class II water quality standard, which should be a maximum of 3 mg/L. Similarly, COD levels reached 30–50 mg/L, exceeding the 25 mg/L threshold. Total Suspended Solids (TSS) also remained high, indicating a heavy load of organic and inorganic pollutants. These figures indicate that the river is not yet safe for basic uses such as raw water and fisheries.<sup>21</sup>

Institutionally, the government reports that more than 1,600 factories operate along the Citarum River Basin, primarily in the textile, food and beverage, and chemical sectors. Although many are required to have wastewater treatment plants (WWTPs), not all are functioning optimally. A 2022 inspection by the Ministry of Environment and Forestry (KLHK) found at least 68 companies proven to have violated quality standards, mostly textile factories in Greater Bandung.<sup>22</sup> Some of these were only subject to administrative sanctions in the form of warnings or fines, with the average fine amounting to IDR 1–2 billion. This amount pales in comparison to the costs of ecosystem restoration, which can reach tens to hundreds of billions of rupiah. Criminal cases against polluters remain very limited; data shows that only a handful have resulted in court verdicts, while the majority have ceased at the administrative or civil sanctions stage. This situation has profound

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<sup>20</sup> Mayangsari and others, ‘Assessing Compliance with Environmental Regulations: A Case Study of Fines Imposed on Companies in the Citarum River Basin, Indonesia’; Astriani and others, ‘Identifying the Use of Smart Enforcement in Citarum River Environmental Law Enforcement’.

<sup>21</sup> Mariana Marselina, Nurul Aulia Rahmi, and Siti Ai Nurhayati, ‘The Water Quality of the Upper Citarum: Applying the Overall Index of Pollution, Said-WQI, and Pollution Index Methods’, *Heliyon*, 11.2 (2025), p. e41690, doi:<https://doi.org/10.1016/j.heliyon.2025.e41690>.

<sup>22</sup> Nurul Fahimah and others, ‘Pyrethroids in Groundwater near the Citarum River: Insights into Ecological and Health Risks’, *Groundwater for Sustainable Development*, 29 (2025), p. 101422, doi:<https://doi.org/10.1016/j.gsd.2025.101422>.

implications for human rights.<sup>23</sup>

The pollution of the Citarum River results in communities along the riverbanks facing significant health risks. Data from the West Java Health Service indicate that incidences of skin diseases, diarrhea, and gastrointestinal infections are higher in areas surrounding the river basin. Furthermore, academic reports indicate the potential accumulation of heavy metals such as mercury (Hg), lead (Pb), and cadmium (Cd) in the water and sediments of the Citarum River, which can cause long-term impacts such as kidney damage, nervous system disorders, and even the risk of cancer.<sup>24</sup> This situation clearly violates the right to health, the right to clean water, and the right to a good environment as guaranteed in Article 28H paragraph (1) of the 1945 Constitution and various international human rights instruments that Indonesia has ratified.<sup>25</sup>

In terms of law enforcement, on February 25, 2020, the Bale Bandung District Court granted a civil lawsuit filed by the Ministry of Environment and Forestry (KLHK) against the company KKTI, which was found guilty of polluting the Citarum Watershed. The company was sentenced to IDR 4.25 billion in material damages, lower than the KLHK's initial demand of IDR 18.2 billion. This ruling marked a historic step in the "in dubio pro natura" (in dubio pro natura) framework, a recognition that the law must favor environmental conservation.<sup>26</sup> Shortly thereafter, on February 26, 2020, the North Jakarta District Court also ordered HAYI, located in South Cimahi, to pay IDR 12.013 billion in material damages. This amount was slightly lower than the KLHK's initial demand of Rp 12.198 billion, but demonstrated that legal mechanisms can hold companies accountable

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<sup>23</sup> Joko Setiyono and Aga Natalis, 'Ecocides as a Serious Human Rights Violation: A Study on the Case of River Pollution by the Palm Oil Industry in Indonesia', *International Journal of Sustainable Development and Planning*, 16.8 (2021), pp. 1465–71, doi:10.18280/ijstdp.160807.

<sup>24</sup> Rosetyati R Utami and others, 'Environmental Prioritization of Pesticide in the Upper Citarum River Basin, Indonesia, Using Predicted and Measured Concentrations', *Science of The Total Environment*, 738 (2020), p. 140130, doi:https://doi.org/10.1016/j.scitotenv.2020.140130.

<sup>25</sup> Willy Naresta Hanum and Muhamad Nafi Uz Zaman, 'Existence of Human Rights Protection in Land and Mining Conflicts: Evidence from Indonesia', *Journal of Law, Environmental and Justice*, 2.3 (2024), pp. 285–306, doi:10.62264/jlej.v2i3.107.

<sup>26</sup> Diana Rahayuning Wulan and others, 'Novel Insights into the Presence and Risks of Phthalate Esters in the Citarum River, Indonesia: Seasonal Variations', *Environmental Nanotechnology, Monitoring & Management*, 23 (2025), p. 101082, doi:https://doi.org/10.1016/j.enmm.2025.101082.



for ecosystem damage.

While these two decisions represent important steps, it is important to note that civil cases and compensation still predominate over environmental criminal proceedings, which involve ecosystem restoration and the fulfillment of community rights. The rate of criminal prosecutions in court for pollution in the Citarum River remains very low, considering the scale of the damage. Many perpetrators are only subject to administrative penalties or small fines without systematic reparation obligations, while affected communities are still waiting for ecological restoration and the fulfillment of their right to a healthy environment.<sup>27</sup> These two cases highlight a significant gap in environmental law enforcement in Indonesia. Even when companies are proven to have polluted, settlements often focus on financial compensation rather than restorative measures (environmental restoration and the fulfillment of rights). From a human rights perspective, this is inadequate because it does not guarantee that affected communities receive redress, such as access to clean water or ecosystem rehabilitation.<sup>28</sup>

Thus, Citarum River pollution can no longer be viewed simply as a technical environmental management issue. It is a multidimensional crisis that tests the state's commitment to its constitutional and international obligations to respect, protect, and fulfill human rights. The improvements in water quality reflected in the IKA (Indonesian Water Resources Standards) must be accompanied by reforms in criminal law enforcement that focus more on restitution, rather than simply administrative punishment.<sup>29</sup> Without this, the Citarum River will continue to symbolize the state's failure to ensure a healthy environment for its citizens.

The Citarum River pollution case demonstrates fundamental weaknesses in the

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<sup>27</sup> Indah Rachmatiah Siti Salami and others, 'Health Risk Assessment of Physicochemical and Heavy Metals Exposures of the Usage of Shallow Groundwater Located at the Proximity to Citarum River, Indonesia', *Case Studies in Chemical and Environmental Engineering*, 11 (2025), p. 101153, doi:<https://doi.org/10.1016/j.cscee.2025.101153>.

<sup>28</sup> Roumiana Metcheva, Peter Ostoich, and Michaela Beltcheva, 'Ecocide – Global Consequences (Pesticides, Radionuclides, Petroleum Products)', *BioRisk*, 17 (2022), pp. 7–18, doi:<https://doi.org/10.3897/biorisk.17.77438>.

<sup>29</sup> Fahimah and others, 'Pyrethroids in Groundwater near the Citarum River: Insights into Ecological and Health Risks'; Wulan and others, 'Novel Insights into the Presence and Risks of Phthalate Esters in the Citarum River, Indonesia: Seasonal Variations'.

effectiveness of law enforcement. Court decisions awarding billions of rupiah in compensation to polluting companies (e.g., the 2020 cases of KKTI and HAYI) represent a step forward, but they remain limited to material compensation. Criminal instruments are rarely used, and administrative sanctions often lack a deterrent effect. Furthermore, environmental restoration, the core of environmental law enforcement and the fulfillment of the community's right to a healthy environment, remains suboptimal. From a human rights perspective, affected communities continue to experience violations of their rights to health, clean water, and a decent standard of living.

Conversely, in the UK, the River Thames case demonstrates that successful river restoration relies not only on financial compensation but also on strict regulations, high criminal fines, and public participation. Companies or individuals who violate environmental regulations are not only subject to fines but can also face direct criminal sanctions.<sup>30</sup> The Environmental Agency's mechanisms allow for robust and consistent oversight, resulting in a drastic reduction in pollution over several decades. Interestingly, ecosystem restoration is prioritized, and public participation is encouraged as a way to guarantee the environmental rights of future generations.<sup>31</sup>

In India, the Ganges River case demonstrates another approach: the proactive role of the judiciary through Public Interest Litigation (PIL).<sup>32</sup> The Supreme Court of India has repeatedly issued judgments affirming that Ganges pollution violates citizens' constitutional right to a dignified life, as enshrined in Article 21 of the Indian Constitution. While policy implementation remains challenging, this jurisprudence confirms the direct link between environmental pollution and human rights violations.<sup>33</sup> Thus, Indian law is

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<sup>30</sup> Karolina Skalska and others, 'Spatio-Temporal Trends in Microplastic Presence in the Sediments of the River Thames Catchment (UK)', *Marine Pollution Bulletin*, 207 (2024), p. 116881, doi:<https://doi.org/10.1016/j.marpolbul.2024.116881>.

<sup>31</sup> J Savage and others, 'Just around the River Bend: The Fate of Plastic Bottle Pollution in the Thames Estuary', *Marine Pollution Bulletin*, 220 (2025), p. 118453, doi:<https://doi.org/10.1016/j.marpolbul.2025.118453>.

<sup>32</sup> Oindrila Bose and others, 'Land Use and Land Cover Patterns as a Reflection of Subsurface Architecture Groundwater Quality in a Large Urban Center (Varanasi) in the Ganges River Basin, India', *Groundwater for Sustainable Development*, 26 (2024), p. 101271, doi:<https://doi.org/10.1016/j.gsd.2024.101271>.

<sup>33</sup> Clint Carroll, 'Native Enclosures: Tribal National Parks and the Progressive Politics of Environmental Stewardship in Indian Country', *Geoforum*, 53 (2014), pp. 31–40, doi:<https://doi.org/10.1016/j.geoforum.2014.02.003>.

not merely repressive but also progressive in affirming fundamental citizen rights.

**Table 1 Comparison of Environmental Law Enforcement: Citarum, Thames, and Ganges Rivers**

Aspects	Citarum River (Indonesia)	Thames River (UK)	Ganga River (India)
Type of Law Enforcement	Civil and administrative cases dominate; material compensation is used more often than criminal penalties	Criminal and civil law run parallel; high fines and criminal penalties are applied	Proactive justice through Public Interest Litigation (PIL); pollution is considered a violation of the Constitution
Focus of Sanctions	Financial (material) compensation and ecosystem restoration are still limited	Deterrent effect (large fines, prison sentences), ecological restoration is a priority	Human rights protection (right to life with dignity), court orders for river restoration
Role of Institutions	Ministry of Environment and Forestry, District Court; weak oversight, limited coordination	Environmental Agency with broad powers; strict and consistent regulations	Supreme Court as the primary actor; local governments are often asked to implement decisions
Public Participation	Still limited; weak community role in oversight	High; local communities and NGOs are active in maintaining water quality	High Court; communities and NGOs frequently file PILs with the courts
Relationship to Human Rights	Not yet clear; community rights to a healthy environment are often ignored	Implicitly recognized through environmental policies that safeguard future generations	Very firm; river pollution is seen as a violation of Article 21 of the Constitution (right to life)
Results or Impacts	River remains heavily polluted despite compensation cases	The Thames has been successfully restored and is now considered one of the cleanest rivers in Europe	Ganga remains polluted, but there have been significant developments in human rights jurisprudence

Table 1 shows a significant gap in environmental law enforcement between Indonesia, the UK, and India. In the Citarum River, legal mechanisms are still dominated by civil and administrative channels, focusing on financial compensation. At the same time, aspects of ecosystem restoration and the fulfillment of community rights have not been maximized.<sup>34</sup>

<sup>34</sup> Utami and others, 'Environmental Prioritization of Pesticide in the Upper Citarum River Basin, Indonesia, Using Predicted and Measured Concentrations'; Mayangsari and others, 'Assessing Compliance with Environmental Regulations: A Case Study of Fines Imposed on Companies in the Citarum River Basin, Indonesia'; Astriani and others, 'Identifying the Use of Smart Enforcement in Citarum River Environmental Law Enforcement'.

This contrasts with the UK, where the Thames River was successfully restored through the implementation of strict criminal sanctions, high fines, strict regulations, and strong public participation.<sup>35</sup> In India, the Ganges River exhibits a unique pattern of proactive justice through Public Interest Litigation, so that river pollution is directly viewed as a violation of citizens' constitutional rights to a decent life.<sup>36</sup> This comparison confirms that the novelty of this research lies in the emphasis that environmental law enforcement in Indonesia needs to go beyond financial compensation, integrating criminal deterrence, ecological restoration, and explicit recognition of human rights as part of environmental law policy.

### *The Experience of the UK and India in Enforcing Laws on River Pollution*

The UK's experience in addressing pollution of the Thames River is one of the most prominent success stories in the history of modern environmental law. In the 19th century, the Thames River was in dire condition due to uncontrolled domestic and industrial waste disposal. This culminated in 1858, known as the Great Stink, when the stench from the waste-filled river paralyzed government operations and seriously threatened public health. This crisis forced the British government to respond with significant reforms, including the construction of a modern sewer system by Sir Joseph Bazalgette and the establishment of a stricter environmental regulatory framework.<sup>37</sup>

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<sup>35</sup> Subramaniam Kugathas, Richard J Williams, and John P Sumpter, 'Prediction of Environmental Concentrations of Glucocorticoids: The River Thames, UK, as an Example', *Environment International*, 40 (2012), pp. 15–23, doi:<https://doi.org/10.1016/j.envint.2011.11.007>; Han Lu, Ren Yinshuan, and Zhang Zhufeng, 'Britain's Harnessing of Thames River from the Perspective of Peace Studies and Its Enlightenment—Research Based on the Background of Great Stink in London', *Heliyon*, 9.6 (2023), p. e17491, doi:<https://doi.org/10.1016/j.heliyon.2023.e17491>.

<sup>36</sup> Shahab Uddin and others, 'Climate Change and ENSO Significantly Enhances Seasonal Flood Occurrence in the Ganges-Brahmaputra-Meghna Basin', *Journal of Hydrology*, 658 (2025), p. 133207, doi:<https://doi.org/10.1016/j.jhydrol.2025.133207>; Abhijit Debnath, Prabhat Kumar Singh, and Yogesh Chandra Sharma, 'Spatial Distribution of Heavy Metals in the Sediments of River Ganges, India: Occurrence, Contamination, Source Identification, Seasonal Variations, Mapping, and Ecological Risk Evaluation', *Marine Pollution Bulletin*, 198 (2024), p. 115910, doi:<https://doi.org/10.1016/j.marpolbul.2023.115910>; Sharma, Joshi, and Bowes, 'A Tale of Two Rivers: Can the Restoration Lessons of River Thames (Southern UK) Be Transferred to River Hindon (Northern India)?'

<sup>37</sup> Omotola Folorunsho, Anna Bogush, and Ivan Kourtchev, 'Occurrence of Emerging and Persistent Organic Pollutants in the Rivers Cam, Ouse and Thames, UK', *Science of The Total Environment*, 962 (2025), p. 178436, doi:<https://doi.org/10.1016/j.scitotenv.2025.178436>.

In the modern era, the successful restoration of the Thames is mainly due to the role of the Environment Agency, an independent agency with broad powers to oversee environmental quality. This agency has a comprehensive legal toolkit, ranging from administrative sanctions and imposing heavy fines to criminal prosecution of violators. One notable example is the case of Thames Water Utilities Limited. In 2017, the company was fined £20.3 million (approximately Rp360 billion) by Southwark Crown Court for dumping toxic waste into the River Thames, causing the death of thousands of fish and damaging the ecosystem. The judge called this violation one of the worst pollution cases in modern British history. The case demonstrates how significant criminal sanctions, coupled with public pressure, can act as a deterrent and encourage companies to comply with environmental standards.<sup>38</sup>

On the other hand, India's experience with the Ganges River demonstrates a different but equally relevant path. Since the early 1980s, Ganges pollution has become a significant issue, sparking widespread public protests. Unlike the UK, which relies on executive regulation, India has taken a judicial approach through Public Interest Litigation (PIL).<sup>39</sup> The Indian Supreme Court has heard numerous lawsuits from NGOs and community groups demanding the protection of the river as a source of spiritual, economic, and health life. In a landmark ruling, the Supreme Court affirmed that Ganges pollution violates Article 21 of the Indian Constitution, which guarantees the right to a decent standard of living. On this basis, environmental pollution is treated as a violation of human rights, not simply an administrative matter.<sup>40</sup>

This jurisprudence has had far-reaching implications. Both the central and state governments of India have been encouraged to shut down thousands of industries discharging waste directly into the Ganges, build wastewater treatment plants, and

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<sup>38</sup> Ali J Ali, Ashraf A Ahmed, and Maysam F Abbod, 'Groundwater Level Predictions in the Thames Basin, London over Extended Horizons Using Transformers and Advanced Machine Learning Models', *Journal of Cleaner Production*, 484 (2024), p. 144300, doi:<https://doi.org/10.1016/j.jclepro.2024.144300>.

<sup>39</sup> Normawati Binti Hashim, 'Moves towards Progressive Legal Framework and Energetic Jurisprudential Behavioral on the Enforcement of Public Interest Litigation in the New Millennium', *Procedia - Social and Behavioral Sciences*, 105 (2013), pp. 484–90, doi:<https://doi.org/10.1016/j.sbspro.2013.11.051>.

<sup>40</sup> Bo Cheng, Zhimeng An, and Wei Li, 'Regulatory Enforcement and Firm Sustainability: Evidence from China's Environmental Public Interest Litigation Reform', *Economic Analysis and Policy*, 85 (2025), pp. 530–45, doi:<https://doi.org/10.1016/j.eap.2024.12.017>.

revitalize the river basin.<sup>41</sup> Although implementation still faces obstacles, ranging from budget constraints, weak oversight, and political interests, the Supreme Court's ruling has shifted the paradigm: the environment is not just a matter of regulation, but also of constitutionality and the protection of citizens' fundamental rights. Thus, the Civil Procedure Code (PIL) in India serves as a means of public resistance to pollution and an instrument for democratizing environmental law.<sup>42</sup>

Comparing these two experiences reveals a difference in orientation. The UK emphasizes the effectiveness of strict criminal sanctions, consistent oversight mechanisms, and public involvement as key factors in restoring the Thames River. India, on the other hand, prioritizes a proactive judicial role and a human rights approach in addressing Ganges River pollution.<sup>43</sup> Both models have advantages: the UK demonstrates how consistent regulation and penalties can create a deterrent effect and successful restoration. In contrast, India demonstrates how a constitutional basis can broaden the meaning of environmental law enforcement as an integral part of protecting citizens' rights to life.<sup>44</sup>

In the Indonesian context, particularly in the case of the Citarum River, the experiences of the UK and India offer important lessons. From the UK, Indonesia can learn the importance of firm regulations, significant criminal fines, and coordinated oversight mechanisms. From India, Indonesia can draw inspiration that environmental law enforcement should also be linked to the fulfillment of human rights, so that river pollution is no longer viewed merely as a technical issue, but as a violation of people's fundamental rights. By combining these two approaches, Indonesia can build a stronger,

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<sup>41</sup> Sarvajeet Kumar Sinha, R Srikanth, and Sudha Mahalingam, 'Regulatory Framework for India's Energy Security and Sustainability', *Energy Policy*, 162 (2022), p. 112815, doi:<https://doi.org/10.1016/j.enpol.2022.112815>.

<sup>42</sup> Olivia Anggie Johar, Edi Setiadi, and Dini Dewi Heniarti, 'Reforming Environmental Criminal Law: A Comparative Study of the United States, the Netherlands, India, and Indonesia', *Kosmik Hukum*, 25.2 (2025), doi:[10.30595/kosmikhukum.v25i2.26167](https://doi.org/10.30595/kosmikhukum.v25i2.26167).

<sup>43</sup> Sheila Jasanoff, 'India at the Crossroads in Global Environmental Policy', *Global Environmental Change*, 3.1 (1993), pp. 32–52, doi:[https://doi.org/10.1016/0959-3780\(93\)90013-B](https://doi.org/10.1016/0959-3780(93)90013-B).

<sup>44</sup> Johar, Setiadi, and Heniarti, 'Reforming Environmental Criminal Law: A Comparative Study of the United States, the Netherlands, India, and Indonesia'; Ken Peak, 'Criminal Justice, Law, and Policy in Indian Country: A Historical Perspective', *Journal of Criminal Justice*, 17.5 (1989), pp. 393–407, doi:[https://doi.org/10.1016/0047-2352\(89\)90049-4](https://doi.org/10.1016/0047-2352(89)90049-4); Sharma, Joshi, and Bowes, 'A Tale of Two Rivers: Can the Restoration Lessons of River Thames (Southern UK) Be Transferred to River Hindon (Northern India)?'

more equitable model of environmental law enforcement that is oriented toward ecosystem restoration and the protection of people's rights, drawing on the effectiveness of British-style criminal law and India's human rights approach.<sup>45</sup>

**Table 2 Comparison of Real Cases of River Pollution Law Enforcement**

Aspects	Thames River Case - UK (Thames Water, 2017)	The Ganga River Case - India (M.C. Mehta v. Union of India, 1985 - 1998)
Parties Involved	Thames Water Utilities Limited (water utility company)	The Indian government, industries along the Ganga River, and civil society
Type of Violation	Discharge of toxic waste into the River Thames, causing the deaths of thousands of fish and ecosystem damage	Massive pollution of the Ganga River due to untreated industrial and domestic waste
Legal Instrument	Criminal enforcement by the Environment Agency through Southwark Crown Court	Public Interest Litigation (PIL) in the Supreme Court of India under Article 21 of the Constitution
Decision	Fine of £20.3 million (approximately Rp360 billion), one of the most significant environmental fines in the UK	In order to close polluting factories, mandate the construction of sewage treatment plants, and recognize pollution as a violation of the right to life
Decision Orientation	Providing a deterrent effect on companies and ensuring regulatory compliance	Protecting human rights (the right to a decent standard of living), broadening the paradigm of pollution as a constitutional issue
Impact	Improving corporate compliance, strengthening environmental oversight systems, and promoting the restoration of the River Thames	Increasing public legal awareness and strengthening the proactive role of the judiciary, although implementation still faces obstacles
Lessons for Indonesia	The importance of strong and consistent criminal sanctions for a deterrent effect	The need to emphasize river pollution as a violation of human rights and a constitutional obligation of the state

Based on Table 2, the comparison of the real-life cases above demonstrates two distinct approaches to enforcing river pollution laws. In the UK, the 2017 Thames Water case marked a significant milestone, as the largest water utility company was fined £20.3 million for discharging toxic waste into the Thames River, causing ecosystem damage. This ruling emphasized the strong orientation of criminal law, aimed at creating a

<sup>45</sup> Johar, Setiadi, and Heniarti, 'Reforming Environmental Criminal Law: A Comparative Study of the United States, the Netherlands, India, and Indonesia'; Peak, 'Criminal Justice, Law, and Policy in Indian Country: A Historical Perspective'.

deterrent effect and ensuring compliance with environmental regulations. Its impact was significant, not only increasing corporate compliance but also strengthening oversight systems and accelerating the restoration of the Thames River's quality.

Meanwhile, in India, the case of *M.C. Mehta v. Union of India* (1985–1998) demonstrated the proactive role of the judiciary in addressing pollution of the Ganges River. Through Public Interest Litigation (PIL), the Supreme Court affirmed that river pollution violated Article 21 of the Indian Constitution, which stipulates the right to a decent standard of living.<sup>46</sup> This ruling not only ordered the closure of polluting plants and the construction of wastewater treatment plants, but also broadened the meaning of environmental law enforcement as a human rights protection. Although its implementation faced various obstacles, this case succeeded in raising public legal awareness and strengthening the legitimacy of the judiciary as a key actor in environmental issues.<sup>47</sup>

Comparing the two cases, it is clear that the UK relies on harsh criminal sanctions, while India emphasizes a human rights approach through the constitution. Both offer important lessons for Indonesia: the need to combine the strictness of criminal law with an explicit recognition that river pollution is a violation of fundamental human rights. Such an integrated approach would be more effective in addressing chronic pollution, such as in the Citarum River Basin.

### ***Environmental Law Enforcement in the Pollution of the Citarum River: Integrating Human Rights and Ideal Criminal Liability Provisions***

Environmental law enforcement in the Citarum River pollution case is crucial, given that the river not only serves as a strategic natural resource for the socio-economic life of the community but also as an ecological space that supports the sustainable livelihoods of millions of West Java residents. Severe pollution, primarily from the textile industry,

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<sup>46</sup> Normawati Hashim, 'Towards New Frontier of Constitutional Recognition of Environmental Protection in Urban Regeneration', *Procedia - Social and Behavioral Sciences*, 170 (2015), pp. 415–21, doi:<https://doi.org/10.1016/j.sbspro.2015.01.002>.

<sup>47</sup> Normawati Binti Hashim, 'Constitutional Recognition of Right to Healthy Environment: The Way Forward', *Procedia - Social and Behavioral Sciences*, 105 (2013), pp. 204–10, doi:<https://doi.org/10.1016/j.sbspro.2013.11.021>.



agriculture, and household waste, has resulted in severe damage to water quality, loss of biodiversity, and harm to public health. This situation has given rise to multidimensional problems that relate not only to environmental law but also to human rights.<sup>48</sup>

Indonesia's environmental legal framework is quite adequate. Law No. 32 of 2009 concerning Environmental Protection and Management and the criminal law instruments in the Criminal Code (KUHP) provide the legal basis for prosecuting polluters. However, in practice, law enforcement in Citarum pollution cases often emphasizes administrative resolution or civil compensation, with relatively infrequent application of criminal law. This creates a loophole that reduces the deterrent effect on polluters and creates the impression that environmental crimes are not serious crimes.<sup>49</sup>

On the other hand, environmental pollution must also be viewed as a human rights violation. The right to a healthy environment is recognized in Article 28H of the 1945 Constitution and Law Number 39 of 1999 concerning Human Rights.<sup>50</sup> Pollution of the Citarum River Basin directly impacts the right to health, the right to clean water, and the right to a decent standard of living. Therefore, the failure to enforce environmental criminal law is not merely a reflection of the weak performance of law enforcement officials, but also reflects the state's failure to fulfill its obligation to protect citizens' human rights.<sup>51</sup>

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<sup>48</sup> Astriani and others, 'Identifying the Use of Smart Enforcement in Citarum River Environmental Law Enforcement'; Utami and others, 'Environmental Prioritization of Pesticide in the Upper Citarum River Basin, Indonesia, Using Predicted and Measured Concentrations'.

<sup>49</sup> Gregorius Widiartana, Vincentius Patria Setyawan, and Ariesta Wibisono Anditya, 'Ecocide as an Environmental Crime: Urgency for Legal Reform in Indonesia', *Journal of Law, Environmental and Justice*, 3.2 (2025), pp. 268–308, doi:10.62264/jlej.v3i2.129; Rika Fajrini, 'Environmental Harm and Decriminalization of Traditional Slash-and-Burn Practices in Indonesia', *International Journal for Crime, Justice and Social Democracy*, 11.1 (2022), pp. 28–43, doi:10.5204/ijcsd.2034.

<sup>50</sup> Firdaus, Oksimana Darmawan, and Yuliana Primawardani, 'Constructing Human Rights Justiciability in Human Rights Courts in Indonesia', *Proceedings of the 1st International Conference on Law and Human Rights 2020 (ICLHR 2020)*, 549.26 (2021), pp. 112–23, doi:10.2991/assehr.k.210506.017.

<sup>51</sup> Pedi Obani and Joyeeta Gupta, 'Legal Pluralism in the Area of Human Rights: Water and Sanitation', *Current Opinion in Environmental Sustainability*, 11 (2014), pp. 63–70, doi:https://doi.org/10.1016/j.cosust.2014.09.014; Ariana E Athy and others, 'Clarifying Longitudinal Relations between Individuals' Support for Human Rights and Climate Change Beliefs', *Journal of Environmental Psychology*, 84 (2022), p. 101875, doi:https://doi.org/10.1016/j.jenvp.2022.101875; Hanum and Zaman, 'Existence of Human Rights Protection in Land and Mining Conflicts : Evidence from Indonesia'.

Therefore, an integration of human rights perspectives with environmental criminal law instruments is necessary.<sup>52</sup> This integration necessitates acknowledging that environmental pollution constitutes a crime against humanity on a significant scale, as it directly threatens societal survival. The ideal model of criminal accountability here would not only implicate corporations as legal subjects but also criminalize the negligence of company directors or management who allow pollution to occur. Furthermore, the criminal sanctions imposed should not be limited to financial fines. However, they should include obligations for ecological restoration, temporary suspension of operations, and even permanent closure for serious and repeat violators.<sup>53</sup>

International experiences, such as the cases of the Thames River in the UK and the Ganges River in India, demonstrate that successful environmental law enforcement requires a combination of strong criminal sanctions and human rights protections as a moral and constitutional basis.<sup>54</sup> The UK emphasizes high fines and strict enforcement of regulations by independent regulatory bodies. At the same time, India views river pollution as a violation of citizens' constitutional rights, thus providing greater space for civil society to demand justice.<sup>55</sup> Both approaches offer important lessons for Indonesia in

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<sup>52</sup> Obani and Gupta, 'Legal Pluralism in the Area of Human Rights: Water and Sanitation'; Mao Jun Xiang and Belengar Francis Maïnkade, 'The Human Rights-Based Approach to Sustainable Development: Lessons from Recent African Investment Treaty Practice', *Heliyon*, 9.8 (2023), p. e18578, doi:<https://doi.org/10.1016/j.heliyon.2023.e18578>; Miloon Kothari, 'The Human Right to Adequate Housing and The New Human Right to Land: Congruent Entitlements', in *The Cambridge Handbook of New Human Rights: Recognition, Novelty, Rhetoric* (Cambridge University Press, 2020), pp. 81–96, doi:[10.1017/9781108676106.007](https://doi.org/10.1017/9781108676106.007).

<sup>53</sup> Jonathan Klaaren, 'Human Rights: Legal Aspects', in *International Encyclopedia of the Social & Behavioral Sciences (Second Edition)*, ed. by James D Wright, Second Edi (Elsevier, 2015), pp. 375–79, doi:<https://doi.org/10.1016/B978-0-08-097086-8.86158-9>; Alison D Renteln, 'Human Rights', in *Encyclopedia of Violence, Peace, & Conflict (Third Edition)*, ed. by Lester R Kurtz, Third Edit (Academic Press, 2022), pp. 276–98, doi:<https://doi.org/10.1016/B978-0-12-820195-4.00227-2>; Isabella Kaminski, 'Does Climate Change Threaten Human Right to Health?', *The Lancet Planetary Health*, 7.4 (2023), pp. e268–69, doi:[https://doi.org/10.1016/S2542-5196\(23\)00058-X](https://doi.org/10.1016/S2542-5196(23)00058-X).

<sup>54</sup> Ori Sharon and others, 'Ecosystem Services and Judge-Made Law: A Review of Legal Cases in Common Law Countries', *Ecosystem Services*, 32 (2018), pp. 9–21, doi:<https://doi.org/10.1016/j.ecoser.2018.05.010>; Jasanoff, 'India at the Crossroads in Global Environmental Policy'.

<sup>55</sup> Quy-Toan Do, Shareen Joshi, and Samuel Stolper, 'Can Environmental Policy Reduce Infant Mortality? Evidence from the Ganga Pollution Cases', *Journal of Development Economics*, 133 (2018), pp. 306–25, doi:<https://doi.org/10.1016/j.jdeveco.2018.03.001>; Sharma, Joshi, and Bowes, 'A Tale of Two Rivers: Can the Restoration Lessons of River Thames (Southern UK) Be Transferred to River Hindon (Northern India)?'

formulating a more effective model for environmental criminal law enforcement.

Therefore, environmental law enforcement in the Citarum River Basin requires a new paradigm that places human rights as the foundation and criminal law as the primary repressive instrument. Integrating the two will result in a law enforcement mechanism that not only prosecutes perpetrators but also guarantees the fundamental rights of communities to live in a clean and healthy environment, while strengthening efforts to restore river ecosystems.<sup>56</sup>

**Table 3 Integration of Human Rights and Environmental Criminal Law in the Citarum River Pollution Case**

Aspects	Human Rights Approach	Environmental Criminal Law Approach	Ideal Integration
Normative Basis	The right to a healthy environment (Article 28H of the 1945 Constitution; Human Rights Law No. 39/1999)	Law No. 32/2009 concerning Environmental Management and Management; Criminal Code; Related Implementing Regulations	Emphasizes pollution as a human rights violation and a serious crime
Object of Protection	The right to health, the right to clean water, and the right to a decent standard of living	Environmental Quality, Ecosystems, and Natural Resources	Comprehensive protection for humans and river ecosystems
Subjects Involved	The state as guarantor of human rights, the community as rights holders	Individuals, Corporations, and Officials as Criminal Subjects	Corporations, their managers, and public officials are subject to criminal penalties for human rights violations through pollution
Types of Accountability	The state is obliged to protect, respect, and fulfill the human rights of its citizens	Criminal Liability of Individuals and Corporations for Pollution	Corporate criminal liability + state responsibility to protect human rights
Enforcement Instruments	The National Commission on Human Rights, human rights courts, and public participation mechanisms	Environmental Criminal Investigation, Prosecution, and Trial	Integrated mechanism: criminal investigation + human rights mechanisms (judicial review, civil litigation, etc.)
Types of Sanctions	Reparations, restoration of rights, compensation	Fines, Imprisonment, Restitution Orders, Company Closure	Criminal sanctions + ecological restoration obligations + human rights reparations for the

<sup>56</sup> Jasanoff, 'India at the Crossroads in Global Environmental Policy'; Do, Joshi, and Stolper, 'Can Environmental Policy Reduce Infant Mortality? Evidence from the Ganga Pollution Cases'; Hashim, 'Constitutional Recognition of Right to Healthy Environment: The Way Forward'.

Aspects	Human Rights Approach	Environmental Criminal Law Approach	Ideal Integration
			community
Ultimate Goals	Guaranteed fundamental community rights to a healthy environment	Deterrent Effect, Legal Compliance, and Environmental Protection	Environment restored, human rights protected, perpetrators receive strict sanctions

Table 3 illustrates that law enforcement regarding Citarum River pollution cannot be viewed solely from an environmental law perspective but must be integrated with a human rights perspective. From a normative perspective, the right to a healthy environment is guaranteed in Article 28H of the 1945 Constitution and Law No. 39 of 1999 concerning Human Rights, while environmental criminal law refers to Law No. 32 of 2009 concerning Environmental Management and the criminal provisions of the Criminal Code. The integration of the two creates a legal framework that positions pollution as both a serious crime and a human rights violation.

In terms of the objects of protection, the human rights approach emphasizes the right to health, the right to clean water, and the right to a decent standard of living. In contrast, the environmental criminal approach focuses more on protecting ecosystem quality.<sup>57</sup> The integrative model demands comprehensive protection, namely ensuring the sustainability of the river ecosystem while guaranteeing the fulfillment of fundamental community rights. Regarding legal subjects, human rights require the state to be responsible as a protector and guarantor of rights, while criminal law prosecutes individuals and corporations responsible for pollution. Ideal integration broadens the scope to include negligent public officials or corporate managers, so that criminal liability is not only corporate but also personal.<sup>58</sup>

In terms of accountability, human rights require the state to respect, protect, and fulfill

<sup>57</sup> Do, Joshi, and Stolper, 'Can Environmental Policy Reduce Infant Mortality? Evidence from the Ganga Pollution Cases'; Muhammed Siddik Abdul Samad, George K Varghese, and Babu J Alappat, 'Environmental Forensics in India – Four Years after the National Green Tribunal Act, 2010', *Procedia Environmental Sciences*, 30 (2015), pp. 91–96, doi:<https://doi.org/10.1016/j.proenv.2015.10.016>.

<sup>58</sup> Xinxin Wang and Kevin Lo, 'Civil Society, Environmental Litigation, and Confucian Energy Justice: A Case Study of an Environmental NGO in China', *Energy Research & Social Science*, 93 (2022), p. 102831, doi:<https://doi.org/10.1016/j.erss.2022.102831>; Duan Liu and others, 'Environmental Litigation Risk Premium in Corporate Equity Financing Costs', *Energy Economics*, 143 (2025), p. 108229, doi:<https://doi.org/10.1016/j.eneco.2025.108229>.

the rights of the public, while criminal law emphasizes imposing sanctions on perpetrators.<sup>59</sup> The integrative model combines the two, so that corporations are criminally responsible, while the state retains its constitutional obligation to protect its citizens. Enforcement instruments must also be dual. While human rights law relies on institutions like the National Commission on Human Rights (Komnas HAM) or public participation mechanisms, criminal law utilizes investigation, prosecution, and adjudication. Ideal integration can be achieved through an integrated mechanism that allows for the combination of criminal investigations with human rights instruments, including judicial review or public interest litigation. In terms of sanctions, human rights emphasize restitution and compensation, while environmental crimes emphasize fines, imprisonment, and restitution obligations.<sup>60</sup> The integrative model requires that criminal sanctions be linked to ecological restoration and human rights reparations for affected communities.

Ultimately, the ultimate goal of this integration is to create a law enforcement system that not only deters polluters but also restores the Citarum River ecosystem while ensuring the protection of the fundamental rights of the communities that depend on the river. Thus, river pollution is positioned not only as an environmental crime but also as a violation of fundamental human rights.

#### 4. CONCLUSION

This study confirms that environmental law enforcement in the Citarum River pollution case still faces various structural, normative, and implementation obstacles. Despite the

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<sup>59</sup> Xian Liu, Wen Wang, and Shoujun Huang, 'Criminal Enforcement and Environmental Performance: Evidence from China', *Ecological Economics*, 224 (2024), p. 108267, doi:<https://doi.org/10.1016/j.ecolecon.2024.108267>; Fajrini, 'Environmental Harm and Decriminalization of Traditional Slash-and-Burn Practices in Indonesia'.

<sup>60</sup> Uta Wehn and Abeer Almomani, 'Incentives and Barriers for Participation in Community-Based Environmental Monitoring and Information Systems: A Critical Analysis and Integration of the Literature', *Environmental Science & Policy*, 101 (2019), pp. 341–57, doi:<https://doi.org/10.1016/j.envsci.2019.09.002>; Agung Dwi Sutrisno, Chun-Hung Lee, and I Wayan Koko Suryawan, 'Examining Community Desire to Change for Adaptive Transition in Post-Mining Ecological Sustainability: Community Transition in Post-Mining Sustainability', *The Extractive Industries and Society*, 20 (2024), p. 101537, doi:<https://doi.org/10.1016/j.exis.2024.101537>; Kevin Lo and Liyuan Zhu, 'Voices from below: Local Community Perceptions of Forest Conservation Policies in China', *Forest Policy and Economics*, 144 (2022), p. 102825, doi:[10.1016/J.FORPOL.2022.102825](https://doi.org/10.1016/J.FORPOL.2022.102825).

legal basis provided by Law No. 32 of 2009 concerning Environmental Protection and Management and the criminal law instruments in the Indonesian Criminal Code, law enforcement practices in Indonesia place more emphasis on administrative sanctions and civil compensation. This situation results in a weak deterrent effect. It demonstrates the state's failure to guarantee citizens' human rights to a healthy environment, as guaranteed by Article 28H of the 1945 Constitution and Law No. 39 of 1999 concerning Human Rights. Comparison with international experience reveals practices that can provide important lessons for Indonesia. In the UK, the successful restoration of the Thames River quality was supported by the application of strict criminal sanctions, strict monitoring, and public involvement. Meanwhile, in India, the Ganges River case demonstrates how pollution is viewed as a violation of citizens' constitutional rights, enabling the courts to compel the government and industry to undertake remedial measures. From these two practices, the lesson can be drawn that effective environmental law enforcement in Indonesia must integrate a human rights perspective with ideal criminal liability provisions. Environmental pollution must be viewed not only as an environmental crime but also as a violation of fundamental human rights. This integrative model demands a combination of strict criminal sanctions, ecological restoration obligations, and human rights reparations for affected communities. Thus, the novelty of this research lies in its proposed paradigm of environmental law enforcement that is simultaneously based on human rights and criminal law. This approach is expected to strengthen efforts to restore the Citarum River ecosystem, guarantee the community's fundamental rights, and encourage reform of Indonesia's environmental legal system to make it more effective, equitable, and sustainable.

## 5. CONFLICTING INTEREST STATEMENT

The authors state that there is no conflict of interest in the publication of this article.

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