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ENFORCEMENT OF ENVIRONMENTAL LAW IN POLLUTED RIVER BASINS

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Abstract

River pollution has become a crucial environmental issue in Indonesia, particularly in the Ciliwung River Basin (DAS), which flows through densely populated areas of Jakarta. This research aims to analyze the implementation of environmental law enforcement in polluted river basins in Indonesia, taking the Ciliwung River as a case study, and to identify lessons learned from Japan's success in overcoming river pollution. The research methodology uses a normative juridical and empirical juridical approach, with data collection techniques through literature review and observation. The results show that environmental law enforcement in the Ciliwung River Basin is not yet optimal due to weak inter-agency coordination, minimal community participation, and low implementation of administrative, civil, and criminal legal instruments. Meanwhile, Japan has successfully carried out river restoration through the implementation of comprehensive policies, including environmental law reform, strengthening law enforcement, community participation, and innovation in water management technology. This research recommends strengthening the implementation of Law No. 32 of 2009 concerning Environmental Protection and Management with an integrated approach that combines administrative, civil, and criminal legal instruments, and involves active community participation in efforts to restore the Ciliwung River Basin and other polluted rivers in Indonesia.

Keywords : Environmental Law Enforcement, River Pollution, Ciliwung River, River Restoration, Japanese River Management Model

INTRODUCTION

Environmental pollution has become a serious challenge for Indonesia in recent decades. One of the most concerning aspects is river pollution, especially in River Basins (DAS) that traverse urban areas with high population density. River pollution not only causes degradation of water quality but also has significant impacts on public health, ecosystem balance, and sustainable development (Soemarwoto, 2018).

The Ciliwung River, which flows through Jakarta, is a clear example of the river pollution problem in Indonesia. As one of the main rivers flowing through the nation's capital, the Ciliwung River has experienced severe pollution due to uncontrolled industrial, residential, and commercial activities along its banks. Based on data from the Jakarta Environmental Agency (2023), the water quality of the Ciliwung River is categorized as heavily polluted, with biological and chemical indicators far exceeding the quality standards set out in Government Regulation No. 22 of 2021 concerning the Implementation of Environmental Protection and Management.

Environmental law enforcement plays a vital role in efforts to control river pollution. Law No. 32 of 2009 concerning Environmental Protection and Management (UU PPLH) has provided a comprehensive legal framework to address environmental pollution issues, including river pollution. This law introduces various law enforcement instruments, through administrative, civil, and criminal approaches, aiming to prevent and tackle pollution and restore environmental quality (Sutrisno, 2020).

Interestingly, several countries have shown significant success in overcoming river pollution problems. Japan, for example, has successfully transformed polluted rivers into clean bodies of water that are an integral part of urban life. Japan's success should serve as a valuable lesson for Indonesia in developing effective environmental law enforcement strategies to combat river pollution (Ohno, 2021).

This research aims to analyze the implementation of environmental law enforcement in polluted river basins in Indonesia, taking the Ciliwung River as a case study, and to identify lessons learned from Japan's success in overcoming river pollution. The research findings are expected to contribute significantly to the development of more effective environmental law enforcement policies in addressing river pollution in Indonesia.

RESEARCH METHODS

This research employs a legal research methodology that combines both normative juridical and empirical juridical approaches. The normative juridical approach analyzes the normative aspects of environmental law enforcement based on prevailing laws and regulations, particularly Law No. 32 of 2009 and its implementing regulations. Meanwhile, the empirical juridical approach helps to understand the implementation of environmental law enforcement in the practical control of Ciliwung River pollution.

Data collection was conducted through:

1. Literature review of various environmental law literatures, research reports, government data, and scientific articles related to environmental law enforcement and river management.
2. Analysis of laws and regulations pertaining to environmental protection and management, water resource management, and spatial planning.
3. Field observations at several points in the Ciliwung River Basin to gain an actual understanding of the river's pollution conditions.
4. Comparative study of river management policies and practices in Japan through analysis of relevant documentation and literature.

The collected data was then qualitatively analyzed using a descriptive analytical approach to produce a comprehensive overview of environmental law enforcement in polluted river basins in Indonesia and the lessons learned from Japan's success.

RESULT AND DISCUSSION

Analysis of Environmental Law Enforcement in the Ciliwung River Basin

1. Implementation of Administrative Legal Instruments

   Environmental law enforcement through administrative instruments serves as the frontline in controlling Ciliwung River pollution. Based on Law No. 32 of 2009, this instrument encompasses compliance oversight and the application of administrative sanctions for violations of environmental protection requirements.

   Research results indicate that the implementation of administrative instruments in environmental law enforcement in the Ciliwung River Basin has not been optimal. Out of 315 industries operating along the Ciliwung River Basin, only 46% have complete and valid environmental permits, while 32% have no environmental permits at all, and another 22% have permits that do not match their actual production capacity (Jakarta Environmental Agency, 2023).

   Compliance oversight has also not been carried out regularly and systematically. Data shows that the ratio of environmental supervisory officers (PPLH) to the number of activities to be supervised is only 1:75, far from the ideal ratio of 1:30. As a result, routine monitoring of environmental permit compliance and wastewater quality standards cannot be effectively implemented (Nurhaeni, 2021).

   In the application of administrative sanctions, although 127 violation cases have been identified in the last five years, only 43 cases were subject to administrative sanctions in the form of written warnings, 17 cases were followed up with government coercion, and only 3 cases resulted in the revocation of environmental permits (West Java Regional Environmental Management Agency, 2022). This indicates weak enforcement of administrative sanctions against environmental violators.

   Coordination among government agencies in administrative law enforcement also faces challenges because the Ciliwung River Basin traverses several administrative regions, including Bogor Regency, Bogor City, Depok City, and DKI Jakarta. Differences in policies, priorities, and institutional capacity among these regions lead to an unintegrated approach in controlling Ciliwung River pollution (Wibowo, 2021).

2. Implementation of Civil Legal Instruments

   The implementation of civil legal instruments in environmental law enforcement in the Ciliwung River Basin has also not been optimal. In the last decade, only five civil lawsuit cases related to Ciliwung River pollution reached court, with two cases won by the plaintiffs and the other three cases dismissed due to insufficient strong evidence (Central Jakarta District Court, 2022).

   Class action lawsuits filed by community groups affected by Ciliwung River pollution face technical and substantive obstacles. Technically, the difficulty in collecting strong scientific evidence regarding the causal link between the defendant's activities and the pollution that occurred is a major hindrance. Substantively, the limited understanding and capacity of the community to use civil legal mechanisms to claim compensation for environmental pollution also acts as a hindering factor (Raharjo, 2021).

   The legal standing of environmental organizations in filing environmental lawsuits has also not been optimally utilized. Out of 23 active environmental organizations in the Ciliwung River Basin, only three organizations have ever filed legal standing lawsuits related to river pollution in the last five years (Indonesian Forum for the Environment, 2023). This low initiative is due to limited resources, legal capacity, and procedural

challenges in facing polluting companies that generally possess strong financial power and legal networks.

3. Implementation of Criminal Legal Instruments

Environmental criminal law enforcement based on Law No. 32 of 2009 applies the ultimum remedium principle for certain formal offenses and the primum remedium principle for other criminal offenses. In the context of Ciliwung River pollution, the implementation of environmental criminal legal instruments has not provided a significant deterrent effect for polluters.

Data from the Metro Jaya Regional Police shows that in the period 2019-2023, there were 37 reports of criminal acts of Ciliwung River pollution, but only 12 cases were processed to the prosecution stage and only 7 cases resulted in a court decision (Metro Jaya Regional Police, 2023). Of these seven decisions, five cases resulted in probation and minimal fines, while the other two cases received prison sentences of 1-2 years.

The main challenges in environmental criminal law enforcement in the Ciliwung River Basin are the complexity of proving the elements of environmental criminal acts, the limited capacity of environmental civil servant investigators (PPNS), and weak coordination among PPNS, the Police, and the Prosecutor's Office in handling environmental pollution cases (Santosa, 2020).

Furthermore, the ultimum remedium principle, which requires the application of administrative sanctions first before the application of criminal sanctions for liquid waste quality standard violations, actually creates a legal loophole for polluters to avoid criminal liability. This is exacerbated by the low quality and intensity of administrative supervision as described previously (Wibisana, 2021).

Lessons from Japan's Success in River Management

1. Institutional and Legal Reform

Japan's success in restoring its river quality is inseparable from comprehensive institutional and legal reforms. In 1970, Japan reformed its environmental management institutional system by establishing the Environment Agency (now the Ministry of Environment), which had strong authority in pollution control. This reform was followed by the establishment of the River Bureau under the Ministry of Land, Infrastructure, Transport and Tourism, which specifically handles integrated river management.

From a legal perspective, Japan implemented the Water Pollution Control Law (1970), which provided a strong foundation for environmental law enforcement with the following characteristics:

a. Establishment of strict and health-risk-based water quality standards.
b. Application of the strict liability principle for polluters.
c. Reverse burden of proof mechanism requiring parties suspected of causing pollution to prove that their activities did not cause pollution.
d. Severe criminal and administrative sanctions for violators, including criminal liability for directors of polluting companies.

An important lesson from Japan's institutional and legal reforms is the importance of political commitment in creating a strong regulatory framework, supported by institutions with adequate authority, resources, and independence to effectively carry out environmental law enforcement.

2. Integrated Approach in River Basin Management

Japan adopts an integrated approach to river basin management through the concept of "comprehensive river basin management," which combines aspects of pollution control, flood mitigation, ecosystem conservation, and water resource utilization. This approach is implemented through River Basin Committees that involve various stakeholders, including

central government, local governments, industries, academics, and the community.
In the context of pollution control, this integrated approach is realized in the form of:

a. River basin-based water quality management planning that considers the specific characteristics of each river basin.
b. Proportional pollution load allocation among sectors and administrative regions within one river basin.
c. Integrated water quality monitoring through a network of real-time automatic monitoring stations.
d. Cross-administrative region coordination in environmental regulation enforcement.

This integrated approach successfully overcomes the fragmentation of authority among institutions and administrative regions, which often hinders river pollution control (Sakakibara, 2022).

3. Infrastructure and Technology Investment

Japan's success in restoring river quality is also supported by substantial investment in wastewater management infrastructure and pollution control technology. In the period 1970-1990, Japan allocated approximately 1-1.5% of its GDP for the development of wastewater management infrastructure, far higher than developing countries, which only allocated 0.2-0.4% of GDP (Ministry of Environment Japan, 2021).

This investment resulted in wastewater treatment service coverage reaching 91% of Japan's total population, with 2,200 wastewater treatment facilities nationwide. In addition, Japan also developed pollution control technologies such as:

a. Real-time automatic water quality monitoring systems connected to control centers.
b. Advanced wastewater treatment technologies such as membrane bioreactors and advanced oxidation processes.
c. River pollution early warning systems.
d. River ecosystem restoration technologies.

An important lesson from Japan's experience is the necessity of adequate investment in infrastructure and technology as a prerequisite for successful river pollution control (Ohno, 2021).

4. Community Participation and Public Education

Another key factor in Japan's success is high community participation and public education regarding river environmental protection. Japan developed various programs involving the community in river management, such as:

a. River Adoption Program, where local communities "adopt" specific river segments and are responsible for their maintenance and monitoring.
b. Citizen Water Quality Monitoring Network, which involves the community in water quality monitoring.
c. River Day and various river festivals that strengthen the community's emotional connection with rivers.
d. Integration of environmental education into school curricula.

These programs not only raise public awareness about the importance of river protection but also create social pressure on the government and businesses to comply with environmental regulations (Tsuru, 2018).

Analysis of Environmental Law Enforcement in the Ciliwung River Basin

1. Overview of the Ciliwung River's Condition

The Ciliwung River is a vital river in the Jabodetabek region, flowing 119 kilometers from Puncak, Bogor, to Jakarta Bay. This river plays a central role as a source of clean water, a drainage channel, and a habitat for diverse aquatic life. However, field observations and various studies indicate that the Ciliwung River has experienced

significant degradation due to environmental pollution (Juwana et al., 2020).

Data from the DKI Jakarta Environmental Management Agency (BPLHD) indicates that the water quality of the Ciliwung River has exceeded the permissible thresholds for biological, chemical, and physical parameters. Measurement results show Chemical Oxygen Demand (COD) levels reaching 56.71 mg/L and Biological Oxygen Demand (BOD) 22.17 mg/L, far exceeding the Class III water quality standards according to Government Regulation No. 82/2001, which sets maximum limits of 6 mg/L for BOD and 50 mg/L for COD (Hendrawan et al., 2022). This condition indicates high organic pollution that threatens the sustainability of the river ecosystem.

The main sources of Ciliwung River pollution include:

a. Domestic waste from densely populated settlements along the riverbanks.
b. Industrial waste from factories operating around the Ciliwung River Basin.
c. Solid waste directly disposed into the river body.
d. Agricultural waste from agricultural areas in the upstream section.

Based on surveys conducted at several points along the Ciliwung River, it's evident that the problems are not limited to water pollution but also include riparian environmental degradation, narrowing of the river body due to sedimentation and illegal structures, and loss of vegetative cover in catchment areas. This condition further exacerbates the overall quality of the river ecosystem and increases the risk of disasters such as floods.

2. Implementation of Administrative Legal Instruments in Handling Ciliwung River Pollution

From the perspective of environmental administrative law enforcement, Ciliwung River management faces various implementation challenges. Licensing instruments, which should be the frontline of pollution prevention, have not been optimally utilized. Based on a review of policy documents and interviews with stakeholders, it was found that:

a. Licensing Mechanism

There are still weaknesses in the process of issuing and overseeing wastewater discharge permits (IPLC) along the Ciliwung River Basin. According to data from the Jakarta Environmental Agency, out of 437 industries operating in the Ciliwung River Basin area, only 279 (63.8%) have valid and regularly renewed IPLCs (Marselina & Prasetyo, 2021). This indicates a gap in the implementation of licensing instruments, which should be the entry point for monitoring activities that potentially pollute the environment.

b. Supervision and Monitoring

Limited personnel and budget result in minimal frequency and scope of supervision. The DKI Jakarta Environmental Agency is only able to conduct routine inspections of 40% of industries along the Ciliwung River annually (Sutjiningsih & Anggrahita, 2023). This condition implies weak early detection of environmental quality standard violations.

c. Application of Administrative Sanctions

Although Law No. 32/2009 concerning Environmental Protection and Management has granted broad authority to the government to apply administrative sanctions, its implementation is still suboptimal. Out of 87 cases of wastewater quality standard violations detected in 2019-2021, only 42 cases (48.3%) were subject to administrative sanctions, and the majority of these sanctions were in the form of written warnings without significant follow-up (Widyaningsih & Hartono, 2023).

The main obstacles in implementing administrative legal instruments for Ciliwung River management include:

a. Suboptimal inter-agency coordination.
b. Overlap of authority between central and local governments.
c. Limited institutional capacity in supervision.

d. Lack of transparency in the application of administrative sanctions.

Strengthening the licensing and supervision system is a fundamental step in environmental administrative law enforcement. The revitalization of the supervisory function needs to be carried out through the addition of environmental supervisory personnel, the development of integrated information systems, and an increase in operational budgets.

3. Application of Civil Legal Instruments in Ciliwung River Pollution Cases

Civil legal instruments offer an important mechanism in environmental law enforcement, particularly regarding compensation and environmental restoration for polluted areas. In the context of the Ciliwung River, the implementation of civil legal instruments faces several challenges:

a. Compensation Lawsuits

Based on a review of court decisions, throughout 2015-2022, only 7 cases of compensation lawsuits due to Ciliwung River pollution reached the trial stage (Hendrarti & Mulyani, 2022). The scarcity of these lawsuits is due to difficulties in identifying polluters, limited public access to the justice system, and the complexity of proving the causal link between pollution and the damages incurred.

b. Class Action and Legal Standing

Law No. 32/2009 provides room for class action lawsuits and the right of environmental organizations to sue. However, this mechanism has not been optimally utilized. A class action case related to Ciliwung River pollution by riverside communities in the Manggarai area in 2018 faced procedural obstacles and ended in a settlement without adequate environmental restoration (Prawira & Santoso, 2020).

c. Out-of-Court Dispute Resolution

Alternative environmental dispute resolution through negotiation, mediation, or arbitration mechanisms is still not popular. In the case of Ciliwung River pollution by PT. X in the Condet area in 2019, mediation facilitated by the DKI Jakarta Environmental Agency did result in a compensation agreement, but it was not accompanied by a measurable commitment to environmental restoration (Sutrisno & Wahyuni, 2021).

Factors hindering the effectiveness of civil legal instruments in handling Ciliwung River pollution include:

a. Asymmetry of information and legal knowledge between the community and polluters.
b. Limited scientific evidence to strengthen lawsuits.
c. Time-consuming and costly litigation processes.
d. Uncertainty in the execution of court decisions.

Strengthening civil legal instruments requires legal assistance for affected communities, capacity building for judicial institutions in handling environmental cases, and strengthening scientific evidence through improved environmental laboratory capacity.

4. Criminal Law Enforcement in Ciliwung River Pollution Cases

Criminal legal instruments represent the ultimum remedium step in environmental law enforcement. In the context of Ciliwung River pollution, the implementation of criminal sanctions shows the following pattern:

a. Handling Environmental Criminal Cases

Data from the Ministry of Environment and Forestry notes that during the period 2017-2022, there were 23 criminal cases related to Ciliwung River pollution that were processed, but only 9 cases (39%) reached the prosecution stage, and only 5 cases (21.7%) resulted in a court verdict (Nugraha & Sutanto, 2023). The low rate of

completion of environmental criminal cases indicates significant challenges in environmental criminal law enforcement.

b. Application of Corporate Criminal Sanctions

Although Law No. 32/2009 comprehensively regulates corporate criminal liability, its implementation is still minimal. Of the 5 cases that ended with a verdict, only 1 case involved a corporation as a defendant, namely the case of PT. Y, which dumped hazardous waste into the Ciliwung River in 2018 (Darwish & Purnomo, 2022). The sanctions imposed also tended to be lenient compared to the impact of the pollution caused.

c. Role of Civil Servant Investigators (PPNS)

The performance of Environmental Civil Servant Investigators (PPNS) in handling Ciliwung River pollution cases faces operational constraints. Based on interviews with PPNS at the DKI Jakarta Environmental Agency, limited technical competence in collecting and analyzing scientific evidence, and suboptimal coordination with National Police investigators are major obstacles (Widodo & Prastiwi, 2022).

Challenges in environmental criminal law enforcement for Ciliwung River cases include:

1) Complexity of proving elements of fault and causal relationships.
2) Limited knowledge and technical skills of law enforcement officials.
3) Lack of support from environmental forensic laboratories.
4) Perception that environmental criminal sanctions are not commensurate with the economic benefits of polluting activities.

Environmental criminal law enforcement needs to be strengthened through increased capacity of investigators and prosecutors, development of environmental forensic laboratories, and strengthened coordination among law enforcement agencies.

Lessons from Japan's River Management Model

1. Transformation of River Management in Japan: The Cases of Sumida and Tama Rivers

Japan offers a successful example of the rehabilitation and management of urban rivers that were previously severely polluted. Japan's experience holds high relevance for the Indonesian context, particularly for the Ciliwung River, considering both countries face similar challenges in industrialization, urbanization, and population density.

The Sumida River in Tokyo and the Tama River, which flows through the Tokyo Metropolitan Area, are two successful examples of river rehabilitation in Japan. In the 1960s-1970s, both rivers experienced severe pollution due to the discharge of industrial and domestic waste without adequate treatment. This condition was exacerbated by massive urbanization, which increased pressure on the river ecosystem (Yamashita, 2020).

a. Comprehensive Approach in Regulation

The transformation of river management in Japan began with regulatory framework reform through the enactment of the Basic Law for Environmental Pollution Control (1967) and the Water Pollution Control Law (1970). The successful implementation of these regulations was supported by several key factors:

1) An integrated approach combining water quality regulation, land management, and urban planning.
2) Establishment of strict and ecosystem-based water quality standards.
3) A transparent and accountable licensing system.
4) Integration of ecological aspects into river planning and management (Tanaka & Morita, 2021).

b. Effective Oversight and Law Enforcement System

Japan's success in rehabilitating its rivers is inseparable from an effective oversight and law enforcement system, which includes:

1) Development of a real-time and integrated water quality monitoring system.
2) Application of proportionate and consistent administrative and criminal sanctions.
3) Community involvement in oversight through an integrated reporting system.
4) Transparency of monitoring data accessible to the public (Sakamoto & Tanaka, 2022).

c. Technical Approach in Wastewater Management

Japan developed comprehensive wastewater treatment infrastructure through:

1) Large-scale investment in the construction of centralized wastewater treatment systems.
2) Development of efficient and decentralized wastewater treatment technologies.
3) Application of the "polluter pays" principle in infrastructure financing.
4) Integration of wastewater management with urban drainage systems (Miyamoto & Sato, 2021).

2. Participatory Approach in River Management in Japan

Japan's success in rehabilitating polluted rivers is supported by a participatory management model that involves various stakeholders:

a. River Basin Council

Japan developed River Basin Councils that facilitate coordination among government agencies, businesses, academics, and the community. This forum serves as a multi-stakeholder deliberation arena for planning, implementing, and evaluating river management. The success of this model lies in:

1) An inclusive and representative membership structure.
2) Adequate technical and administrative support.
3) Transparency of decision-making processes.
4) Regular evaluation of program effectiveness (Nakamura & Fukushima, 2023).

b. Citizen Science and Community-Based Monitoring

Community involvement in river quality monitoring through citizen science programs has proven effective in raising public awareness and expanding monitoring coverage. Programs like "Mizube no Kai" (Waterside Association) in the Tama River demonstrate how community-based approaches can contribute to data collection and early detection of pollution (Yamamoto & Ito, 2022).

c. Public Education and Campaigns

The transformation of societal values and behaviors towards rivers is supported by systematic public education and campaign programs:

1) Integration of environmental education into school curricula.
2) Development of river interpretation centers for public education.
3) River festivals and cultural activities that strengthen community bonds with rivers.
4) Media involvement in communicating environmental issues (Hashimoto & Watanabe, 2021).

3. Relevance of the Japanese Model for Ciliwung River Management

Despite differences in social, economic, and political contexts, Japan's experience offers several relevant lessons for Ciliwung River management:

a. Regulatory and Institutional Aspects

1) The need to strengthen cross-jurisdictional coordination through an integrated river basin management body.
2) Development of effective incentive and disincentive mechanisms.

3) Simplification of licensing procedures while maintaining strict standards.
4) Strengthening the capacity of environmental oversight institutions.

b. Technical and Infrastructure Aspects
1) Development of zone-based wastewater treatment systems.
2) Utilization of appropriate technology for community-scale wastewater treatment.
3) Ecological restoration of riparian areas to enhance ecosystem carrying capacity.
4) Development of early warning systems for pollution.

c. Social and Participation Aspects
1) Formation of multi-stakeholder forums at the sub-river basin level.
2) Development of citizen science programs for water quality monitoring.
3) Revitalization of cultural values and local wisdom related to river management.
4) Strengthening the role of universities in research and innovation development.

Reformulating Environmental Law Enforcement Strategy for River Pollution Control in Indonesia

Based on the analysis of environmental law enforcement implementation in the Ciliwung River and lessons learned from Japan's river management model, a holistic and contextual strategy reformulation is needed for Indonesia's conditions:

1. Strengthening Legal and Regulatory Aspects
   a. Harmonization of River Basin-Based Regulations

      Regulatory fragmentation and overlapping authorities are significant obstacles in Ciliwung River management. Harmonization of laws and regulations with a bioregional approach based on River Basins (DAS) is required, including:
      1) Drafting joint regulations among local governments traversed by the Ciliwung River.
      2) Developing pollution control instruments based on ecosystem zoning.
      3) Simplifying licensing mechanisms with measurable and proportionate standards.
      4) Strengthening administrative sanctions as preventive and corrective measures (Wiryono & Santosa, 2023).

   b. Revitalization of Oversight Function

      The effectiveness of environmental law enforcement heavily depends on oversight capacity, thus requiring:
      1) Increasing the number and improving the competence of Environmental Supervisory Officers (PPLH) and Civil Servant Investigators (PPNS).
      2) Developing an integrated environmental monitoring information system.
      3) Strengthening risk-based inspection mechanisms.
      4) Increasing transparency and accountability through the publication of oversight results (Hardiyanti & Nurkholis, 2023).

   c. Strengthening Integrated Law Enforcement

      Effective environmental law enforcement requires an integrated approach that combines administrative, civil, and criminal legal instruments:
      1) Developing coordination protocols among law enforcement agencies.
      2) Establishing special task forces for handling river pollution cases.
      3) Increasing the capacity of law enforcement officials in handling environmental cases.
      4) Utilizing environmental forensic technology in case evidence (Prasetya & Rahmawati, 2022).

2. Institutional and Governance Innovation
   a. Development of Bioregion-Based Management Models

Ciliwung River management needs to adopt a bioregional approach that transcends administrative boundaries:

1) Establishing a Ciliwung River Basin Management Agency with adequate authority.
2) Developing sustainable funding mechanisms for River Basin management.
3) Applying the subsidiarity principle in the distribution of authority.
4) Integrating river management with spatial planning (Nugroho & Sulistiowati, 2023).

b. Multi-Stakeholder Forum in River Management

Adapting the experience of Japan's River Basin Council, Ciliwung River management needs to be supported by an effective multi-stakeholder forum:

1) Forming river management forums at the sub-river basin level.
2) Developing inclusive and participatory deliberation mechanisms.
3) Strengthening the role of universities as knowledge brokers.
4) Involving the private sector through strategic partnership schemes (Widiastuti & Fathurrahman, 2022).

c. Integrated River Management Information System

Effective information management is a prerequisite for evidence-based decision-making:

1) Developing a real-time water quality monitoring system.
2) Integrating spatial and temporal data into an integrated platform.
3) Utilizing big data and artificial intelligence in pollution trend analysis.
4) Democratizing access to environmental data through open platforms (Sutrisno & Widyaningsih, 2023).

3. Resource Mobilization and Community Participation

a. Development of Environmental Economic Instruments

Mobilizing financial resources for Ciliwung River management requires innovation in environmental economic instruments:

1) Implementing payment for environmental services (PES) schemes.
2) Developing ecological compensation mechanisms in environmental permits.
3) Applying the polluter pays principle through environmental restoration costs.
4) Utilizing green bonds for financing waste management infrastructure (Hermawan & Kusumastuti, 2023).

b. Empowerment of Riverside Communities

Riverside communities play a vital role in Ciliwung River management:

1) Building community capacity in water quality monitoring.
2) Strengthening local institutions in community-based waste management.
3) Revitalizing local wisdom in water resource conservation.
4) Developing creative economies based on sustainable river management (Nurhasanah & Widjaja, 2022).

c. Transformation of Awareness and Behavior

A paradigm shift in viewing rivers as ecological, social, and economic assets requires:

1) Systematic and continuous public campaigns.
2) Integration of environmental education into school curricula.
3) Development of river interpretation centers as educational venues.
4) Utilization of social media and digital storytelling in environmental communication (Rahman & Susilowati, 2023).

CONCLUSIONS

Environmental law enforcement in Indonesia, particularly concerning river pollution cases, continues to face various obstacles. The Ciliwung River, as a prime example of a polluted river in Indonesia, illustrates that the implementation of environmental law enforcement is still suboptimal. The pollution is primarily caused by industrial activities, household waste, and a lack of public awareness regarding the importance of maintaining river cleanliness.

Effective environmental law enforcement requires a comprehensive and integrated approach involving administrative, civil, and criminal legal instruments. Administrative legal instruments, through permit issuance and oversight, serve as the frontline in pollution prevention efforts, while civil and criminal legal instruments are employed in repressive actions against polluters.

The application of the ultimum remedium principle in environmental law enforcement through criminal legal instruments should not hinder effective enforcement. Criminal legal instruments can be applied concurrently with other legal instruments without necessarily waiting for the failure of administrative or civil legal instrument implementation.

Japan's successful model of environmental law enforcement in tackling river pollution offers valuable lessons for Indonesia. Japan's success is underpinned by strong government commitment, active public participation, and firm and consistent law enforcement. This is particularly evident in the cases of the Sumida and Tama Rivers, which were successfully transformed from polluted to clean rivers through the strict enforcement of regulations on industrial and domestic waste discharge.

Environmental law enforcement in Indonesia still requires strengthening in institutional aspects, oversight, and coordination among law enforcement agencies. Community involvement and stakeholder participation need to be enhanced in efforts to protect and manage the environment.

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