

POLLUTION CONTROL OF THE CITARUM RIVER BASIN THROUGH AN ENVIRONMENTAL LAW APPROACH TO MAINTAIN ENVIRONMENTAL SUSTAINABILITY

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Abstract - This study aims to analyze the issue of sewage pollution into rivers using two approaches, namely the statutory approach and the conceptual approach, in the context of the Citarum Harum Program in West Java, Indonesia. The statutory approach involves analyzing existing environmental laws, identifying gaps in existing regulations, and providing recommendations to strengthen regulations. The conceptual approach, on the other hand, focuses on developing a broader view of the interrelationships between humans, the environment, and the legal system, by formulating a conceptual framework. This research provides recommendations to governments, international organizations and other stakeholders in formulating better policies, regulations and legal practices to protect the environment and society. Research provides a stronger solution to the issue of sewage pollution into rivers. It is hoped that this combined approach will have a positive impact on maintaining environmental sustainability.

Keywords: waste pollution; statutory approach; conceptual approach; Citarum Harum Program; sustainable development

INTRODUCTION

In any part of the world, environmental issues are a hot topic of discussion at regional, national and international levels. The condition of environmental quality is closely related to human existence and all its activities, because humans and their behavior can affect nature and human survival¹. From year to year, the rate of environmental damage, which is marked by the depletion of natural resource supplies and the emergence of various environmental problems, will certainly result in threats to the survival of humans and other creatures. Humanity must realize the importance of the carrying capacity of the environment and the role of natural resources in life in the universe. If the earth is no longer able to support the explosion in the number of people and their activities, humans will experience various difficulties². Human activities with nature must pay attention to environmental sustainability. The environment and biology at this time have become important assets for a country in realizing development; therefore, it is very natural for the government to protect it³. If pollution or environmental damage occurs, the government can take preventive and repressive actions. Environmental protection and management, especially in terms of waste, need to get more supervision and attention from government⁴. Supervision of residential areas that dispose of domestic waste into rivers and companies that produce waste that is harmful to the environment. The reason for the frequent occurrence of pollution by industry and households is due

¹ Cristy Clark and others, 'Can You Hear the Rivers Sing? Legal Personhood, Ontology, and the Nitty-Gritty of Governance', *Ecology Law Quarterly*, 45.4 (2019), 787–844.

² Henrik Josefsson, 'The Environmental Liability Directive, the Water Framework Directive and the Definition of "Water Damage"', *Environmental Law Review*, 20.3 (2018), 151–62.

³ Carl Atkinson, 'The Regulation of Drinking Water Quality: Control by Cooperation Rather than Enforcement', *Environmental Law Review*, 1.3 (1999), 161–71.

⁴ Md Khalid Hasan, Abrar Shahriar, and Kudrat Ullah Jim, 'Water Pollution in Bangladesh and Its Impact on Public Health', *Heliyon*, 5.8 (2019).



to the low level of public obedience and compliance to protect the environment. These violations need to be taken criminal and administrative action⁵.

Literature explains that the environmental problems faced by the world community are almost the same. These problems include the increasing rate of population growth, environmental damage and pollution and the dwindling availability of natural resources. Among these problems, environmental damage and pollution receive considerable attention in line with the availability of natural resources. Environmental pollution is an indicator that law enforcement on clean and healthy environmental management has not gone well⁶. Observing environmental problems globally must take two approaches, namely the statutory approach and the conceptual approach to applicable environmental law⁷.

The statutory approach involves establishing, implementing, and enforcing strict environmental regulations by countries and international organizations. Through a comprehensive analysis of existing environmental laws, this research identifies deficiencies in the current statutory framework and provides recommendations to strengthen existing regulations and fill identified legal gaps⁸. A comparative study of various environmental laws from different countries is also described to evaluate the successful implementation and impact of the regulatory approach different invitations⁹. The conceptual approach to environmental law refers to the development of a broader view of the interrelationships between humans, the environment and the legal system¹⁰. This research formulates a conceptual framework involving environmental ethics, social responsibility, human rights related to the environment, and legal principles of sustainability. The application of these two approaches simultaneously proposes a holistic strategy to address global environmental problems related to waste pollution into water and rivers¹¹. The results of this research will provide guidance to governments, international organizations and other stakeholders in formulating better policies, regulations and legal practices to protect the environment and society. It is hoped that this combined approach will have a significant impact on sustaining our planet and improving the quality of life for current and future generations¹².

In the context of environmental problems in Indonesia in 2020 there are 2,700 medium and large industries which dispose of their waste in sewers and rivers. Many industrial players do not treat their industrial waste in accordance with applicable regulations. During the rainy season, the volume of water in rivers polluted by waste is a common sight. The opportunity for rain to fall is used by some unscrupulous industry players and the public to dispose of wastewater into the ditch. So because they cannot accommodate it, the waste water fills up the road's shoulders. According to a statistical report from the Ministry of Environment, half of household waste goes into sewers and rivers. The main problem of pollution and damage to the watershed is caused by the behavior of

⁵ Agnes Hellner and Yaffa Epstein, 'Allocation of Institutional Responsibility for Climate Change Mitigation: Judicial Application of Constitutional Environmental Provisions in the European Climate Cases Arctic Oil, Neubauer, and l'Affaire Du Siècle', *Journal of Environmental Law*, 35.2 (2023), 207–27.

⁶ Ilham Saputra and Teguh Yudistira, 'A CRIME TO THE ENVIRONMENT', *Science And Research Journal Of Mai Wandeu*, 1.1 (2021), 1–8.

⁷ Qiuyue Yang and others, 'Environmental Regulation, Pollution Reduction and Green Innovation: The Case of the Chinese Water Ecological Civilization City Pilot Policy', *Economic Systems*, 45.4 (2021), 100911.

⁸ Yufeng Mao and others, 'Distribution and Characteristics of Microplastics in the Yulin River, China: Role of Environmental and Spatial Factors', *Environmental Pollution*, 265 (2020), 115033.

⁹ Yang and others; Hellner and Epstein.

¹⁰ Joshua C Gellers, 'Earth System Law and the Legal Status of Non-Humans in the Anthropocene', *Earth System Governance*, 7 (2021), 100083.

¹¹ Vilja Johansson, 'Just Transition as an Evolving Concept in International Climate Law', *Journal of Environmental Law*, 2023, eqad017.

¹² Elizabeth Macpherson, Julia Torres Ventura, and Felipe Clavijo Ospina, 'Constitutional Law, Ecosystems, and Indigenous Peoples in Colombia: Biocultural Rights and Legal Subjects', *Transnational Environmental Law*, 9.3 (2020), 521–40.



the community to channel domestic waste into the wild and the river flow. According to data from the Ministry of Environment, on average each person can produce 0.8 to 2.1 kg of waste per day. In Indonesia, to be precise in West Java, in 2018 -2025 a program for handling polluted rivers has been launched. The Citarum River, which flows across 13 regencies and cities in West Java Province, is a strategic river that is a source of water for agricultural irrigation, hydroelectric power plants (PLTA), and a source of raw water for drinking water as well as land for capture fisheries and cultivation for the people living in its watershed area (DAS). However, pollution and environmental damage from upstream to downstream areas have resulted in huge losses to health, economy, social, ecosystem and environmental resources in this 297 kilometer long river. The lack of understanding of the people in the Citarum Watershed about Clean and Healthy Behavior (PHBS) is a significant cause of pollution. Campaigns from the household to the company level then become a crucial issue that needs to be carried out to support the prevention of pollution and damage to the Citarum watershed at the community level. From the background that has been stated, this study aims to analyze environmental issues related to waste pollution into rivers using two main approaches, namely the statutory approach and the conceptual approach. These two approaches will complement each other in identifying root causes, providing legal solutions, and developing relevant concepts in the context of solving waste pollution issues.

RESEARCH METHODS

The approach method used in this research consists of 2 (two) approaches, namely, the statute approach and conceptual approach. The statutory approach refers to an analytical methodology that focuses on an in-depth study of all laws, rules and regulations related to the legal issues being handled, in this case, the issue of pollution of sewage into rivers¹³. In the context of this research, the statutory approach will involve steps including (1) Identification of relevant laws and regulations is carried out by searching for and identifying laws and regulations that are directly related to environmental protection, waste management and river protection. (2) Analysis of legal provisions, namely each related law and regulation will be analyzed in detail to identify obligations, responsibilities and legal sanctions related to waste pollution into rivers. (3) preparation of legal arguments, namely the results of the analysis will be used as a basis in formulating legal arguments that will be used to solve the issue of waste pollution. This argument must be based on existing legal norms¹⁴.

The conceptual approach focuses on understanding theoretical concepts, principles of environmental law, and philosophical aspects related to the issue of pollution by waste into rivers¹⁵. This approach aims to develop new or alternative concepts in handling the issues at hand. The conceptual approach steps in this research include (1) examine the concept of the environment holistically, including environmental human rights and the principles of environmental justice that can be applied in the context of waste pollution. (2) exploring the concept of environmental impact analysis and its role in assessing the effects of waste pollution on river ecosystems and the environment. (3) developing the concepts studied, developing alternative legal models or concepts for handling pollution of sewage into rivers that are more holistic and sustainable¹⁶.

By combining the two approaches, this research will provide a comprehensive picture and a stronger solution to the issue of sewage pollution into rivers. The statutory approach will provide a strong legal basis, while the conceptual approach will enrich understanding of the theoretical

¹³ Beatriz Garcia, Mandy Meng Fang, and Jolene Lin, 'Marine Plastic Pollution in Asia: All Hands on Deck!', *Chinese Journal of Environmental Law*, 3.1 (2019), 11–46.

¹⁴ Rakesh Kumar and others, 'Abundance, Interaction, Ingestion, Ecological Concerns, and Mitigation Policies of Microplastic Pollution in Riverine Ecosystem: A Review', *Science of The Total Environment*, 782 (2021), 146695.

¹⁵ Benoit Mayer, 'The Contribution of Urgenda to the Mitigation of Climate Change', *Journal of Environmental Law*, 35.2 (2023), 167–84.

¹⁶ Niko Soinen and others, 'The Impact-Based Regulatory Strategy in Environmental Law: Hallmark of Effectiveness or Pitfall for Legitimacy?', *Journal of Environmental Law*, 35.2 (2023), 185–206.

concepts underlying environmental protection ¹⁷. Thus, this research is expected to provide an important contribution in efforts to maintain environmental sustainability and sustainable river management.

DISCUSSION

1. Trends in Environmental Pollution Issues in Rivers and Water in Developing Countries

Since the 1980s, climate change has been recognized as an important area for the global community around the world. The threat of global warming is increasing rapidly due to the anthropogenic impact on the environment. The impact of climate change on water supplies is a serious problem in many developing countries. Experts predict that about a quarter of the global population will experience water scarcity ¹⁸. Environmental issues in developing countries like Jordan with water scarcity have suffered for decades. Limited water supply hinders social welfare and economic development. The problem is compounded by the arrival of refugees in the sense that it will increase the population, so that the demand for water will increase ¹⁹. The wars in Iraq and Syria have added to the pressure on the government for water resources. There has been an increase in the exploitation of surface water, especially from the Yarmouk and Jordan Rivers as well as groundwater tapping in Disi and Azraq ²⁰. Despite these efforts to meet growing demand, experts project a water deficit of up to 450 million cubic meters by 2025.

With increasing water scarcity and water pollution in recent decades, water issues have received increasing attention in China. A large number of studies on water problems in China have been reported in the literature. The study covers a wide range of topics including water supply management, water demand management, water quality management, flood and drought disaster mitigation, tackling climate change, water institutional legal arrangements, and stakeholder participation. However, the integration of social value analysis into water management is very limited. China's water problem is of global significance and requires solutions beyond its borders. Administratively, China has maintained the traditional top-down system that dominates public sector management, including water, agriculture, and environment ²¹. Environmental problems related to water scarcity and water pollution occur in China. With increasing water scarcity and water pollution in recent decades, water issues have received increasing attention in China. A large number of studies on water pollution problems in China have been reported in the literature. These studies cover the topics of water supply management, water demand management, water quality management, flood or drought disaster mitigation, tackling climate change, water legal and institutional arrangements, and stakeholder participation ²².

The impact of climate change is happening in Malaysia. According to a source from the Department of the Environment, the agricultural sector has experienced a decline in crop productivity due to climate change. Climate change results in a decrease in national food security. Climate change is

¹⁷ Md Jamal Uddin and Yeon-Koo Jeong, 'Urban River Pollution in Bangladesh during Last 40 Years: Potential Public Health and Ecological Risk, Present Policy, and Future Prospects toward Smart Water Management', *Heliyon*, 7.2 (2021).

¹⁸ Navarro Ferronato and Vincenzo Torretta, 'Waste Mismanagement in Developing Countries: A Review of Global Issues', *International Journal of Environmental Research and Public Health*, 16.6 (2019), 1060.

¹⁹ Onwughara Innocent Nkwachukwu and others, 'Focus on Potential Environmental Issues on Plastic World towards a Sustainable Plastic Recycling in Developing Countries', *International Journal of Industrial Chemistry*, 4 (2013), 1–13.

²⁰ Kim J Zietlow, Mirja Michalscheck, and Meike Weltin, 'Water Conservation under Scarcity Conditions: Testing the Long-Run Effectiveness of a Water Conservation Awareness Campaign in Jordan', *International Journal of Water Resources Development*, 32.6 (2016), 997–1009.

²¹ Huijuan Hao and Chenfan Jiang, 'The Path of Transboundary Marine Plastic Waste Management in China, Japan, and South Korea from the Perspective of the Blue Economy', *Frontiers in Marine Science*, 9 (2023), 1075667.

²² Chao Wang and others, 'Structure of the Global Plastic Waste Trade Network and the Impact of China's Import Ban', *Resources, Conservation and Recycling*, 153 (2020), 104591.



also threatening the availability of drinking water. The Malaysian government is having difficulties in reducing the cost of agricultural production and increasing agricultural income and productivity through policy guidelines. As a result, the country's agricultural sector, environment and people's livelihoods will face adverse impacts. Many environmental problems are the result of human activities—both intentional and unintentional—which ultimately drive or trigger environmental disasters²³. A better understanding of the problem and its consequences is critical to changing public opinion and rallying public support for environmental protection. The Philippines has implemented a water rehabilitation project called the Adopt-A-River Project. This project mobilizes local communities to preserve and maintain a clean and safe environment. The campaign program is promoted through outreach and communication. The media used include radio, television, newspapers and the internet. The Adopt A-River project has been implemented in three major tributaries of the region. This study was designed to propose a participation model by considering the level of awareness and perception of the project and the level of citizen participation²⁴.

2. Legislative Approach (Statute Approach) at the Citarum Harum Program in West Java, Indonesia

The Citarum Harum program is intensively socialized to control pollution of the Citarum River watershed (DAS). This cannot be separated from the role of the penta-helix to influence cognition, attitude, and the behavior of people in perceiving this. Increasing understanding and changing people's behavior have contributed to the success of this program. The complexity of the problem and the number stakeholder that need to be involved shows that integration between the sectors involved is really needed in this case.

Based on the Law of the Republic of Indonesia Number 32 of 2009 concerning Environmental Protection and Management Article 1 Paragraph (14) states that "Environmental pollution is the entry or inclusion of living things, substances and energy into the living environment by human activities so that it exceeds the environmental quality" that has been determined In Article 16 it has been explained that environmental destruction is the act of someone who causes direct or indirect changes to the physical, chemical or biological characteristics of the environment, exceeds the quality standard for environmental damage. Article 28 paragraph (1) of the 1945 Constitution of the Unitary State of the Republic of Indonesia (1945 Constitution) states that everyone has the right to live in physical and spiritual prosperity, to have a place to live, and to have a good and healthy place to live, environment and have the right to health services. The mandate of the 1945 Constitution clearly views that the need to obtain a good and healthy environment is one of human rights, therefore, as a consequence the state is obliged to provide protection and guarantees for a healthy environment to all its citizens.

Based on Presidential Decree No. 15 of 2018 March 14 2018 and identification of problems in the field in 23 areas of the Citarum Harum Program task force covering several cities and districts in West Java Province, there are several problems that are of concern, namely, First, the mindset of behavior that lacks care and low awareness of cleanliness of the environment, especially rivers, one of which is the habit of throwing garbage and waste into the river so that accumulation and pollution occur which resulted in the condition of the river water became dirty and polluted. Community participation is very important to increase the usability and efficiency of natural resources and the environment. One of the steps that can be used to support efforts to control pollution and damage is through education to change public awareness and business behavior. In

²³ Shelby Browning, Betsy Beymer-Farris, and Jeffrey R Seay, 'Addressing the Challenges Associated with Plastic Waste Disposal and Management in Developing Countries', *Current Opinion in Chemical Engineering*, 32 (2021), 100682; Ngai Weng Chan and others, 'Social Capital as a Vital Resource in Flood Disaster Recovery in Malaysia', *International Journal of Water Resources Development*, 2018.

²⁴ Meg Parsons and others, 'Disrupting Path Dependency: Making Room for Indigenous Knowledge in River Management', *Global Environmental Change*, 56 (2019), 95–113.



addition, efforts are also needed to increase the importance of raising awareness in preserving and improving the environment, especially in the Citarum river basin and conducting health communication campaigns so that all levels of society can behave clean and healthy through implementing PHBS (Clean and Healthy Behavior) program in the community.

The action plan for controlling pollution and damage to the Citarum watershed has been stipulated in Governor Regulation No. 28 of 2019 concerning the Action Plan for Pollution and Damage Control of the Citarum River Basin for 2019-2025, on June 19 2019. The program's target is to reduce river pollution levels of Citarum with the main indicator Water Quality Index (IKA). West Java Governor Regulation No. 5 of 2019 concerning the Governance of the Implementation of Citarum Watershed Pollution and Damage Control. Presidential Decree No. 15 of 2018 concerning the Acceleration of Watershed Pollution and Damage Control. According to the Coordinating Minister for Maritime Affairs and Fisheries No. 8 of 2018, the working area of the Citarum River Basin TIM is divided into 23 sectors from upstream to downstream.

Presidential Regulation Number 15 of 2018 concerning the Acceleration of Pollution Control and Environmental Damage in the Citarum River Basin Mandates the Governor of West Java as a task force to establish an Action Plan. Based on this mandate, the Governor formed a working group (POKJA) through Governor of West Java Decree No. 614/Kep1304-DLH/2008 concerning a working group for pollution control and damage to the Citarum River watershed (DAS) 2019-2025.

In 2020, the COVID-19 pandemic occurred which caused major changes, especially in aspects of the economy around the world. This change affected the sustainability of implementation in the Action Plan and led to a massive budget reallocation and refocusing in 2020 both at the central, provincial, district and city levels. To follow up on this, the Action Plan for Pollution and Damage Control (*Renaksi PPK*) for the Citarum River watershed (DAS) needs to be reviewed or reviewed to adjust the budget and resources affected by the Covid-19 pandemic. In an effort, the task force commander has issued a Decision Governor No. 614/Kep 565-DLH/2020 concerning amendments to the Decree of the Governor of West Java number 614/Kep1304-DLH/2018 concerning the Working Group on Pollution Control and Damage to the Citarum River Basin.

The review of the Action Plan document for the Acceleration of Handling Conditions in the Citarum River Basin is divided into two phases, namely the short term and the medium term. For the short term, the review is focused on adjusting program outcome targets and activity outputs, as well as budget allocations for 2020-2021 as the implications of budget relocation and refocusing for handling COVID-19. Meanwhile, for the medium term up to 2025, reviews and revisions are carried out not only to follow up on the impact of the pandemic, but also the dynamics of implementing programs and activities.

Revisions were made to policies, programs and target outcomes, activities and output targets, scope and priority of treatment locations, indications and sources of funding, institutional governance, as well as monitoring, evaluation and reporting mechanisms. The action plan for accelerating implementation and damage to the Citarum River Basin is in principle a living document that can be adjusted by following various developments, especially to provide space for innovation in the implementation of programs and activities as well as indications of funding sources, in order to accelerate the achievement of the goals and objectives of controlling pollution and damage to the Citarum river basin. The Citarum Action Plan sets out how much organic load (BOD) must be reduced from each pollutant source by each Regency and City²⁵. The magnitude of the pollution load is needed to achieve the target to be achieved in 2025. To achieve this target, all sectors need to make every effort to reduce their burden, not only handling wastewater from industry and waste, but also other pollutant sources, such as from domestic, livestock, agriculture and other uncertain sources. Documentation of the Revised Action Plan for preventing damage to the Citarum watershed will then be used as a reference for implementing programs and activities for various stakeholders in order to achieve the Citarum Harum Program target of 2025.

²⁵ Mirza Shahreza and others, 'Analysis of the Convergence Communication Model on Waste Bank Program Stakeholders in South Tangerang City, Indonesia', *Nyimak: Journal of Communication*, 4.2 (2020), 249–65.

3. Conceptual Approach at the Citarum Harum Program in West Java, Indonesia

In principle, the basic concept of environmentally sound development is aimed at achieving a sustainable development system. In other words, a development process can be categorized as sustainable development if the process is in harmony with environmental preservation for the needs of society in the future²⁶. As a concept, sustainable development implies development that “pays attention to” and “considers” the environmental dimension in its implementation²⁷.

Environmentally-oriented development which in the long term leads to sustainable development positions the protection of ecosystems and aspects of natural resources in a very central position²⁸. This is because these aspects in the environment are the main factors which in the long run become fundamental elements of the implementation of development to meet the needs of the community²⁹. In Indonesia, by law the concept of sustainable development which focuses on the principle of environmental sustainability which we later know as environmentally sound development has been established since 1999. The environmentally sound sustainable development that we use here is a translation of “sustainable development”. Daly through his theory explained that the basic principles of environmentally sustainable development must at least include three pillars, namely as follows: a. renewable natural resources the rate of harvest must be equal to the rate of regeneration (sustainable production) b. For environmental problems the rate of waste disposal must be equivalent to the assimilation capacity of the environment. c. non-renewable energy sources must be exploited in a quasi-sustainable manner, namely reducing substitution energy pollution³⁰. Based on the theory that has been put forward, it can be concluded that in principle, environmentally sound development is specifically aimed at achieving a sustainable development system in order to guarantee all forms of community needs in the future³¹. The main principle that must be emphasized in this context is principle preserving the environment, and in implementing it, the state through its government structure must make the rule of law and guarantee its implementation through law enforcement officials together with the people within it³².

This concept of sustainable development with the Citarum Harum Program in West Java, Indonesia is used as the basis for planning, implementing, and evaluating the program. The Citarum Harum program which aims to clean and preserve the Citarum River will be directed according to the principles of sustainable development. The state has an important role in preserving the environment. This includes the creation of relevant laws and strong law enforcement by law enforcement officials. By involving the community, countries can ensure that the principles of sustainable development are implemented effectively. This approach can serve as a guideline for program planning, implementation and monitoring to ensure that Citarum River rehabilitation efforts actually achieve long-term goals in protecting the environment and meeting community needs.

The implementation of the Citarum Harum Program, the principles of sustainable development is identified in concrete actions. Efforts to manage water resources (Citarum River) in a sustainable manner in accordance with the principles of regeneration and balanced use reflect the first principle of renewable natural resources. Efforts to manage waste and increase the capacity of environmental assimilation can reflect the second principle regarding handling environmental

²⁶ Zulkifli Aspan and Ahsan Yunus, ‘The Right to a Good and Healthy Environment: Revitalizing Green Constitution’, in *IOP Conference Series: Earth and Environmental Science* (IOP Publishing, 2019), CCCXLIII, 12067.

²⁷ Gellers.

²⁸ Khairunnizam Muhamad Ideres, Ainee Adam, and Sarah Tanyen Ling, ‘THE LEGAL FRAMEWORK FOR WATER POLLUTION IN MALAYSIA: AN ANALYSIS’, *Russian Law Journal*, 11.3 (2023).

²⁹ Sri Winarsi, ‘The Current Position Of Environmental Approval Post-Job Creation Law: Ensuring The Indonesian Sdgs Achievement’, *Russian Law Journal*, 11.2 (2023).

³⁰ Johansson.

³¹ Muhanned Ajab Jindeel Al-Dahhami and Bashir Jammeh Abdul Jabbar, ‘THREATS TO THE MARINE ENVIRONMENT FROM CLIMATE CHANGE AND LEGAL IMPACTS FRAMEWORK FOR TREATING IT’, *Russian Law Journal*, 11.12s (2023).

³² Macpherson, Ventura, and Ospina.



problems. The use of environmentally friendly technology and the use of alternative energy in programs regarding the management of non-renewable energy sources in a quasis-sustainable manner. Maintaining the sustainability of the program, the implementation of environmental law concepts and rule of law principles play an important role. The rule of law shows that the program is run based on clear and fair legal rules. In the case of the Citarum Harum Program, this means that there are regulations governing river management, environmental protection, and rehabilitation measures. The implementation of environmental law is such as regulation of industrial waste disposal, ecosystem protection, and environmental impact monitoring. In implementing regulations, it must ensure that the actions taken are in accordance with the principles of sustainable development and environmental protection.

The Citarum Harum program must also encourage active community participation in implementation. Communities as stakeholders have an important role in maintaining the continuity of the program and ensuring that the principles of sustainable development are recognized and implemented properly. Community participation can assist in monitoring program implementation, providing feedback, and ensuring accountability in Citarum River rehabilitation efforts. It is important to emphasize that the implementation of environmental law concepts must be strictly applied. Strong law enforcement through strict sanctions against environmental violations will help prevent behavior that is detrimental to the environment. This can include fines or legal action against companies or individuals who do not comply with environmental regulations.

An important stage of the realization of sustainable development is continuous measurement and evaluation of program achievements. Ongoing monitoring of water quality, river ecosystems and other environmental impacts should be carried out regularly. This evaluation will help identify successes, constraints, and potential improvements to maintain program sustainability. In its entirety, this discussion section underscores that the realization of sustainable development in the Citarum Harum Program is not only related to physical actions, but also involves the application of rule of law principles and the concept of environmental law. Active community involvement, strict law enforcement, and continuous measurement are key factors in achieving the goal of preserving and sustainably rehabilitating the Citarum River.

Table 1. Target indicators for the achievement of the Citarum Harum Program

Program		Output Indicator	Outcome Indicator	Impact Indicator
Critical Management	Land	Implementation of critical land management	The area of critical land handled	Erosion reduced in the Citarum watershed area
Industrial Management	Waste	Implementation of development and supervision of the industry	Percentage of industries that have been supervised, comply with permits	Effluent/waste from industry meets quality standards
Livestock Management	Waste	<ul style="list-style-type: none"> • Availability of livestock waste processing unit • Implementation of technical guidance and outreach to stock farmers 	Percentage of livestock intervened	The content of fecal coliform decreased
Domestic Wastewater Management		<ul style="list-style-type: none"> • Implementation of STOP OPEN DEFECATION triggering • Availability of a domestic waste water management system 	<ul style="list-style-type: none"> • Number of ODF Declaration Villages • Number of households served by proper sanitation facilities 	The content of fecal coliform decreased
Waste Management		Availability of waste	Percentage of waste	All waste is managed



	management unit	management in Citarum watershed priority villages	
Spatial Planning	<ul style="list-style-type: none"> • Availability of complete spatial use licensing data in the Citarum watershed • Recommendations for following up on discrepancies in space utilization 	<ul style="list-style-type: none"> • Availability of data on spatial use discrepancies in the Citarum watershed. • Reduced number of indications of spatial use violations 	Reduced land use change in the Citarum watershed
Water Resources Management	<ul style="list-style-type: none"> • Construction of floodways and retention ponds for flood control • Implementation of efforts to increase river capacity 	Distribution of area, duration, and height in seven (7) Citarum watershed inundation locations	Reducing the incidence of flooding around the Citarum watershed

4. Stakeholder Participation in the Citarum Harum Program

Community participation in environmental management is closely related to the right to the environment. The right to a good and healthy environment has been protected in the 1945 Constitution of the Republic of Indonesia. After amendments, the provisions are formulated in Article 28H paragraph (1) which affirms: “Every person has the right to live in physical and spiritual prosperity, to have a place to live and to get a good and healthy living environment and the right to obtain health services”. The right to the environment is a subjective right that belongs to everyone. The realization of the right to a good and healthy environment is actually an effort to realize the fulfillment of other human rights, in particular the right to life, the right to a decent standard of living, the right to health, and other rights which are closely related to environmental conditions. good and healthy life. Internationally, the recognition of community participation in making decisions related to the environment has also been recognized as one of the main principles of environmental governance in the 1992 Rio Declaration. Where Principle 10 of the Rio Declaration states that environmental problems are best handled with the participation of all concerned citizens at the same relevant level. The Rio Declaration also stipulates that States are required to ensure that individuals have appropriate access to information regarding the environment held by public authorities, including information about hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. In addition, the state must facilitate and encourage public awareness and participation by providing the best possible information ³³.

Community participation in enforcing international environmental law emphasizes that law enforcement can be achieved in two ways, namely preventive and repressive. As we all know, preventive efforts in environmental enforcement involve the community directly overseeing the course of environmental protection and management ³⁴. In addition to providing suggestions, input, opinions and criticism, the role of the community can also be interpreted as concrete actions from the community in helping the government and the state to preserve the environment. When examining repressive efforts, it means discussing prosecution in the event of a violation of the

³³ Asaah Sumaila Mohammed, Moses Naiim Fuseini, and Kuupiel Cuthbert Baba, ‘Grassroots Stakeholders’ Perception of Participation in the Medium-Term Development Plan of District Assemblies in Ghana: The Case of Sawla-Tuna-Kalba District’, *Heliyon*, 9.8 (2023).

³⁴ Melpomeni Eirini Karantoni and others, ‘Stakeholder Views on Environmental Protection Policies in the National Marine Park of Alonissos Northern Sporades, Greece’, *Sustainable Horizons*, 7 (2023), 100065.



environment, by imposing administrative sanctions, fines, and even criminal punishment for the perpetrators³⁵.

At the beginning of 2018, the government's policy to revitalize Citarum was revived through the Citarum Harum National Program. This program is claimed to be more integrated by involving 16 related ministries. Its implementation was strengthened by Presidential Regulation of Republic of Indonesia Number 15 of 2018 concerning the Acceleration of Control of Pollution and Damage to the Citarum River Basin and followed up by Regulation of the Coordinating Minister for Maritime Affairs Number 8 of 2018 concerning Work Procedures for Steering and Task Forces for the Pollution and Damage Control Team for the Citarum River Basin. Targeted by President Joko Widodo within seven years. Water from the Citarum watershed (DAS) which has an area of 721,945.66 hectares can be used as a source of drinking water by the community. Learning from previous efforts that relied more on the dominant role of the government which were often considered not entirely successful, the Citarum Harum Program Task Force prioritizing collaborative management strategies (collaborative governance). Citarum Harum, which is directly led by the Governor of West Java, applies the pentahelix model which synergizes five elements, namely academics (Academics-A), business actors (Business Actors-B), community members (Community-C), government (Government-G) and media (Media-M). Through the synergy of the five elements mentioned above, it is hoped that there will be an acceleration in carrying out the revitalization and restoration of the condition of the Citarum watershed. Community participation in the implementation of a development program is related to many factors that can be categorized into two groups. First, internal factors, namely things that originate from the values held by the community itself. Second, external factors, namely matters originating from outside the community, both originating from the program or policy itself, as well as those originating from parties with an interest in the implementation of the program³⁶.

Overall, the level of community participation in the implementation of the Citarum Harum Program is in the low category. The low level of participation is found in all stages of participation, both at the stages of information, consultation, joint decision-making, joint action, especially in the stage of supporting self-initiatives. This means that so far, the information received by the community related to the implementation of the Citarum Harum Program in their area of residence is still limited, the community has not been optimally involved in planning, decision-making and has not been involved in joint action related to Citarum Harum activities carried out in their area. Public participation is important because public participation talks about community involvement in policy making. Public participation is also the core of democratic governance. In addition, it is one of the components in creating good governance are inclusive policies where it requires public participation.

The government should already require community participation in its implementation, in an effort to determine the success of development programs. Because the community is the main beneficiary of the watershed management. Communities around the watershed are community groups that interact with the watershed every day, so that the community certainly understands more about watershed-related issues and is responsible for the successful restoration that occurs in the watershed. Therefore, it is very unfortunate if the community is not involved in the design and planning stages of the program. So far, the concept of watershed management in Indonesia seems to have paid little attention to community human resources as an important component in the existence of watersheds, especially regarding community participation in watershed management. The concept of participation aims to create a self-supporting system that provides an opportunity for the public to negotiate their interests so that they are considered and accommodated. Water

³⁵ Wassihun Gebreegizaber Woldeesenbet, 'Stakeholder Participation and Engagement in the Governance of Waste in Wolkite, Ethiopia', *Environmental Challenges*, 3 (2021), 100034; Herman Lelieveldt and Wouter Schram, 'Where Are the Citizens? Unravelling the Lopsided Nature of Stakeholder Participation in the Dutch Regional Energy Transition', *Energy Research & Social Science*, 96 (2023), 102925.

³⁶ Lelieveldt and Schram.



governance places great importance on democratic public participation. so that the involvement of collaborative management between stakeholders or between actors is a necessity ³⁷.

The problems encountered above are proof that the implementation of the Presidential Decree Number 15 of 2018 policy regulation still has various obstacles in waste management in the Citarum River. One of the most urgent things is about public participation. participation as reflected in this study is still very weak, even though public participation is an important variable to determine the effectiveness of achieving the goals of a policy. Especially in the alleviation of domestic and industrial waste. Studying the gaps found in the field, ideally improving the implementation of the Harum Citarum Program requires efforts to increase community participation in the Harum Citarum Program. One of them is adjusting the program to the needs of the local community and realizing the community's ideas as a program implementation plan. This aims to encourage the level of community empowerment in the program. The government, in this case the Citarum Harum Task Force, needs to involve the community in every stage of the program. Community involvement is not only in the implementation process, but the community also needs to be involved in the program planning and evaluation stages. Involving the community in every stage of the program is important to encourage increased community participation in the program. There needs to be an effort to increase community empowerment by making the community the party responsible or holding the power to manage the program ³⁸. This is intended so that the community has the empowerment to face the obstacles that occur during the implementation of the program. There needs to be active collaboration between community participation, government and industry to work together in efforts to handle waste ³⁹.

CONCLUSION

This research takes an interdisciplinary approach by combining a statute approach and a conceptual approach to address the problems of pollution and environmental damage in the Citarum River watershed (DAS) Citarum, West Java, Indonesia. In order to increase the water quality index and maintain environmental sustainability, this study identifies and analyzes issues related to pollution of waste into rivers through legal and conceptual studies.

The statutory approach involves an in-depth analysis of existing environmental regulations, identifying deficiencies in the current regulatory framework, and providing recommendations to strengthen existing regulations and fill identified legal gaps. This approach involves identifying relevant laws and regulations, analyzing legal provisions relating to pollution of sewage into rivers, and developing legal arguments to deal with pollution issues. Meanwhile, the conceptual approach aims to develop an understanding of theoretical concepts, principles of environmental law, and philosophical aspects related to the issue of pollution of sewage into rivers. This approach examines the concept of the environment holistically, explores the concept of environmental impact analysis, and develops alternative legal models or concepts for handling pollution of waste into rivers that are more holistic and sustainable.

The results of this study provide recommendations to governments, international organizations and other stakeholders in formulating better policies, regulations and legal practices to protect the environment and society. A combined statutory and conceptual approach provides a strong legal basis and a deeper understanding of issues of pollution and environmental damage. This research encourages changes in people's behavior, approaches to managing natural resources, and

³⁷ Aracely Burgos-Ayala, Amanda Jiménez-Aceituno, and Daniel Rozas-Vásquez, 'Lessons Learned and Challenges for Environmental Management in Colombia: The Role of Communication, Education and Participation Strategies', *Journal for Nature Conservation*, 70 (2022), 126281.

³⁸ Tatenda Musasa, Kudakwashe C R Muringaniza, and Munaishe Manyati, 'The Role of Stakeholder Participation in Wetland Conservation in Urban Areas: A Case of Monavale Vlei, Harare', *Scientific African*, 19 (2023), e01574.

³⁹ Mekonnen Hailemariam Zikargae, Amanuel Gebru Woldearegay, and Terje Skjerdal, 'Assessing the Roles of Stakeholders in Community Projects on Environmental Security and Livelihood of Impoverished Rural Society: A Nongovernmental Organization Implementation Strategy in Focus', *Heliyon*, 8.10 (2022).

awareness of the importance of maintaining environmental sustainability for the welfare of current and future generations.

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