

Regulations in Wastewater Management and the Impact of Wastewater Pollution in Indonesia

Waluyo¹, Fatma Ulfatun Najicha², Abdul Kadir Jaelani³
^{1,2,3}*Universitas Sebelas Maret* Surakarta, Indonesia
waluyo.fh@staff.uns.ac.id

Abstract- Based on Law Number 17 of 2019 concerning water resources, Water Resources Management is an effort to plan, implement, monitor, and evaluate the implementation of Water Resources Conservation, Utilization of Water Resources, and Control of Water Damage. In water management in Indonesia, there are problems, namely in waste water management, obstacles to waste water management in Indonesia, namely the legislation does not support it, community participation is still lacking, financing factors are quite high and management institutions/institutions are still overlapping. Weak technological aspects. The occurrence of a lot of water pollution due to wastewater results in lowering the amount of oxygen killing animals in the water, increasing the speed of chemical reactions, disturbing animal and plant life, disturbing soil fertility, disturbing plant productivity.

Keywords- Legislation, Impact, Waste water pollution.

I. INTRODUCTION

Environmental pollution is the entry or inclusion of living things, substances, energy or other components into the environment or changes in the environmental order due to human activities or natural processes. So that the quality of the environment drops to a certain level which causes the environment to become less or unable to function according to its designation.[1]

Environmental pollution is one of the problems faced by Indonesia today, the condition of Indonesia's territory which is quite wide and has rich resources, there are also many environmental problems that occur, the problem of environmental problems in Indonesia is still a lot going on, namely pollution caused by many vehicles, industrial areas, environmental pollution through factory waste, and littering, these kinds of problems are very dangerous for people's health, because of the inhaled air, polluted water, floods, which cause health problems. Rivers in Indonesia whose condition is polluted and critical reach 82 percent of the 550 rivers spread throughout Indonesia. The high level of pollution makes the water unfit for consumption. [2]

According to Government Regulation No. 121 of 2015, article 1 paragraph 2 concerning the exploitation of

water resources, the definition of water is all water found on, above or below the ground surface, including sea water on land. Water is

one component of the environment that is very important for the development and growth of living things [3]. For humans, water needs are basic because almost all their daily activities require water. Not only for the needs of daily life such as eating and drinking but also as a means of transportation, power generation, agriculture, animal husbandry and many other interests from water [4]. Indonesia guarantees every citizen to obtain the right to water as stated in the 1945 Constitution Article 33 paragraph 3, which states that "earth, water and natural resources contained therein are controlled by the state and used for the greatest prosperity." people. All river areas in Indonesia in 2010 were in a surplus condition, or the amount of available water was still greater than the demand for water. However, the results of the Water Usage Index (IPA) explain that conditions on the islands of Java, Bali and Nusa Tenggara are critical whether or not they include water needs for maintenance flows. [5]

Meanwhile, about 70 percent of Indonesia's water reserves are located on the islands of Kalimantan and Maluku-Papua. Meanwhile, in urban areas such as Java and Sumatra, there is a water deficit. This means that the availability of water, both surface and ground water is no longer able to meet the needs of the population. One of the impacts of the poor management of water resources is the excessive extraction of groundwater. For example, what happened in Jakarta, the land surface decreased by 5-12 cm/soil. This is due to excessive groundwater extraction and large building loads. As a result, water is lost between the soil in the aquifer layer (a layer that can accommodate and pass water) resulting in empty space (mediaindonesia.com).

At the World Water Forum II (World Water Forum) in The Hague in March 2020, it was stated that Indonesia is in the category of the top ten countries that have renewable water resources. However, in 2025, Indonesia is predicted to be one of the countries that will experience a water crisis. The causes include weakness in water management. According to researchers from the Indonesian Institute of Sciences (LIPI), a number of factors triggering the water crisis include climate change, which is exacerbated by anthropogenic factors, such as

massive water withdrawals for households and industry as well as land conversion.[6] of 1990 concerning Water Pollution Control, water pollution is the entry or inclusion of living things, substances, energy, and or other components into water by human activities so that the quality of the water drops to a certain limit which causes the water to be no longer useful according to its designation.

Based on data from the Central Statistics Agency (BPS), about 46 percent of rivers in Indonesia are in a state of heavily polluted status, 32 percent are heavily polluted, 14 percent are moderately polluted and 8 percent are lightly polluted. It can be seen from these data that many rivers in Indonesia are polluted even though the river is one of the important components in the availability of clean water needed for daily life in society, while the purpose of writing this article is to find out how to manage waste water in Indonesia and how water pollution is caused by pollution.[6] Waste that occurs in Indonesia and its impact on the environment.

II. RESEARCH METHODS

This research is descriptive research. The type of research in this writing includes the type of normative legal research. According to its form, this research is diagnostic research. The types of data used in this research are primary and secondary data, namely legislation and information data from the review of similar research documents that have been carried out before, library materials such as books, literature, newspapers, magazines, journals or archives in accordance with the research to be discussed.

Referring to Soerjono Soekanto's opinion in using secondary data in the legal field in terms of binding strength, it can be divided into 3 (three), the authors use the following data. Primary legal materials, namely laws and regulations relating to water pollution, namely PP No. 20 Article 1 number 2 of 1990 concerning Water Pollution Control. Secondary legal materials are legal materials that provide explanations for primary legal materials, consisting of: books, research results, scientific discoveries, and articles related to water management and water pollution in Indonesia. Tertiary or supporting legal materials, namely materials that provide instructions or explanations for primary and secondary legal materials. Data collection techniques are carried out by literature studies to collect and compile data related to the problem under study. The data obtained in this paper are qualitative in nature. In this case normative research would use a statutory approach.

III. FINDINGS AND DISCUSSION

Based on Law Number 17 of 2019 concerning water resources, Water Resources Management is an effort to plan, implement, monitor, and evaluate the implementation of Water Resources Conservation,

Utilization of Water Resources, and Control of Water Damage. In Indonesia, the management of water resources is still a problem, especially in the management and prevention of water pollution due to waste, both industrial waste and community waste. Indonesia faces several obstacles in centralized wastewater management, especially in residential areas. The first obstacle is that the laws and regulations do not support it. Second, community participation is still lacking. The third obstacle is the financing factor which is quite high and the management institutions/institutions that are still overlapping. The last obstacle is the weakness of the technological aspect.[7]

The first obstacle to waste water management in Indonesia is the lack of supporting laws and regulations. Legal umbrellas at both the central and regional levels are urgently needed to ensure that the development of the domestic wastewater sub-sector is carried out in a directed, measurable, and sustainable manner.[8] Until now, the domestic wastewater sub-sector is not specifically regulated through the *lex specialis* law. However, the mandate of domestic wastewater management is spread in several laws and regulations that are directly or indirectly related, especially Law no. 32 of 2009 concerning Environmental Protection and Management.[1] However, the regulation is still general in nature and does not touch the whole and comprehensive domestic wastewater management system. The legislation that is often used as a reference for the development of domestic wastewater management systems so far is the Minister of Public Works No. 16/Prt/M/2008 concerning National Policy and Strategy for Development of Settlement Wastewater Management System (KSNP-SPALP). However, the cancellation of Law no. 7 of 2004 by the Constitutional Court in 2015 has implications for the enactment of all laws and regulations that use the law as a legal basis, including the Minister of Public Works Regulation concerning KSNP-SPALP. [9] Likewise with Presidential Regulation No.185 of 2014 concerning the Acceleration of Provision of Drinking Water and Sanitation which is an extra effort from the government to increase the acceleration of development in the sanitation sector in Indonesia. [10]

The second obstacle in waste water management is the lack of community participation, household waste is one of the largest contributors to water waste that pollutes water, and household waste disposal is one of the important things owned by households.[11] Without sewerage, waste generated from daily household activities such as bathing, washing, cooking, and so on will pollute environmental conditions and have a negative impact on the environment and health. Based on data obtained from environmental statistics 2020 published by the Indonesian Central Statistics Agency.[13] In 2019, 15.06 percent of households in Indonesia did not have a sewerage system. The remaining 35.41 percent have open sewerage and 49.53 percent have closed sewerage. [14] There are more closed sewerage channels in urban households (64.20%)

than households in rural areas (30.84%). On the other hand, open sewerage channels are more common in rural households (44.20%) than households in urban areas (28.52%). Households that do not have a sewerage channel are mostly found in rural areas (24.96%) compared to urban areas (7.28%). [5]

The final disposal of wastewater that is mostly used by households in urban areas is sewers/sewers/rivers (67.84%), septic tanks (13.16%), and earthen pits (10.1%). Meanwhile, the most widely used waste water final disposal sites by households in rural areas are sewers/sewers/rivers (44.15%) and earthen holes (29.66%) and other disposal sites (17.78%). Sewerage, currently there are still many households that dispose of waste water carelessly more than half of households in Indonesia dispose of waste water into sewers/sewers/rivers (57.42%), through ground holes by 18.7 percent and through infiltration wells by 1.67 percent. Only 1.28 percent dispose of waste through WWTP and 10.26 percent through septic tanks. This results in a lot of river water being polluted due to waste. Based on data from the Ministry of Environment and Forestry in 2019, from 98 rivers in Indonesia 54 rivers were lightly polluted, 6 rivers were lightly polluted with moderate pollution, and 38 rivers were lightly polluted-heavy.[16] This situation is worse than the previous year in 2018, namely from 97 rivers in Indonesia, 67 rivers are lightly polluted, 5 rivers are lightly polluted and 25 rivers are lightly polluted and heavily polluted.[17]

The amount of water pollution that occurs causes several impacts, namely:

1. Lowering the amount of oxygen

Contaminated water contains various kinds of solutions that will block sunlight from entering the water. This will result in difficulties for aquatic plants to carry out the photosynthesis process. Photosynthesis in plants will cause the plant to produce oxygen. If plants are prevented from doing photosynthesis, this will cause the water to get only a little oxygen.

2. Killing the animals in the water

Still related to the impact of water pollution which reduces the amount of oxygen, this impact will be followed by the death of aquatic animals. This is because aquatic animals breathe using oxygen. When the amount of oxygen available in the water decreases, the animal will automatically find it difficult to breathe. This will result in the death of aquatic animals because they do not get oxygen to breathe.

3. Increase the speed of chemical reactions

Polluted water is water that contains various pollutants. Many types of pollutants are chemicals. When water contains a lot of chemicals, this will increase the speed of chemical reactions that occur in the water.

4. Disturbing animal and plant life

Polluted water will clearly interfere with the lives of all living things, both on land and in water, whether in the form of humans, animals, or plants. Polluted water will be drunk by living things that live on land. This will cause various pollutants into the stomach, causing pain. And for aquatic animals and plants, it will obviously be disturbed because water is the habitat of these plants and water stars.

5. Disrupt soil fertility

Polluted water will obviously interfere with soil fertility. This is because the water will seep into the ground on the right or left. This results in the soil also containing various pollutants. If the soil has been polluted with pollutants, automatically the soil is not fertile.

6. Disrupt plant productivity

Still a series with the impact of water pollution that interferes with soil fertility, this will automatically interfere with plant productivity.[18] After all, plants live on the ground. When the land they live in is no longer fertile, and instead contaminated with pollutants, the plants will no longer be productive. Instead, this will have an impact in the form of the death of the plants around the polluted area. [8]

IV. CONCLUSION

Indonesia guarantees every citizen to obtain the right to water as stated in the 1945 Constitution Article 33 paragraph 3, which states that "earth, water and natural resources contained therein are controlled by the state and used for the greatest prosperity." people. Based on Law Number 17 of 2019 concerning water resources, Water Resources Management is an effort to plan, implement, monitor, and evaluate the implementation of Water Resources Conservation, Utilization of Water Resources, and Control of Water Damage. Indonesia faces several obstacles in centralized wastewater management, especially in residential areas. The first obstacle is that the laws and regulations do not support it. Second, community participation is still lacking. The third obstacle is the financing factor which is quite high and the management institutions/institutions that are still overlapping. The last obstacle is the weakness of the technological aspect. The impact of water/river pollution is to reduce the amount of oxygen, to kill the animals in the water, to increase the speed of chemical reactions, to disturb the life of animals and plants, to disturb the fertility of the soil, and to disturb the productivity of plants.

REFERENCES

- [1] F. Wulandari And W. Waluyo, "Efektivitas Pemanfaatan Dana Bagi Hasil Cukai Hasil Tembakau Dalam Bidang Kesehatan Di Kota Surakarta Tahun 2018," *J. Best.*, Vol. 7, No. 1, 2019.
- [2] N. Zuraya, "82 Persen Sungai Di Indonesia Tercemar Dan Kritis," 2019. .
- [3] Presiden Republik Indonesia, "Peraturan Pemerintah No.121 Tahun 2015, Pasal 1 Ayat 2 Tentang Pengusahaan Sumber Daya

- Air Undang-Undang Nomor 17 Tahun 2019 Tentang Sumber Daya Air Pengelolaan Sumber Daya Air.” P. 32, 2015.
- [4] Saparuddin, “Pemanfaatan Air Tanah Dangkal Sebagai Sumber Air Bersih Di Kampus Bumi Bahari Palu,” *J. Smartek*, Vol. 8, No. 2, Pp. 143–152, 2010.
- [5] R. Andianti.Dkk, *Statistik Lingkungan Hidup Indonesia Air Dan Lingkungan*, Vol. 148. Indonesia: Badan Pusat Statistik/Bps - Statistic Indonesia, 2020.
- [6] S. B. Pramuaji, I. G. Ayu, And K. Rachmi, “Pelaksanaan Tugas Pengawasan Dan Pemantauan Lingkungan Pada Dinas Lingkungan Hidup Kabupaten Sukoharjo,” *J. Discret.*, Vol. 1, No. 2, Pp. 114–122, 2020.
- [7] F. U. Najicha, “Dampak Kebijakan Alih Fungsi Kawasan Hutan Lindung Menjadi Areal Pertambangan Berakibat Pada Degradasi Hutan,” *Proceeding Conf. Law Soc. Stud.*, No. 28, 2021.
- [8] D. Fatma, “Dampak Pencemaran Air,” 2016. .
- [9] F. U. Najicha, G. A. K. R. Handayani, And Karjo, “Regulation Of Law Enforcement In Prevention And Handling Of Fire Forests In Environmental Hazards,” *Medico-Legal Update. Medico Legal Update*, Pp. 259–262, 2021, Doi: 10.37506/Mlu.V21i1.2314.
- [10] T. Prasetyawan, “Pengelolaan Air Limbah Domestik,” *Jakarta*, Vol. IX, No. April, 2005.
- [11] H. Sudjudiman And F. U. Najicha, “Pengaturan Pemutusan Hubungan Kerja (Phk) Di Indonesia Dan Singapura,” *Uir Law Rev.*, Vol. 4, No. 2, Pp. 40–50, 2020, Doi: 10.25299/Uirrev.2020.Vol4(2).6767.
- [12] F. U. Najicha, “Oil And Natural Gas Management Policy In Realizing Equal Energy In Indonesia,” *J. Hum. Rights, Cult. Leg. Syst.*, Vol. 1, No. 2, Pp. 71–79, 2021, Doi: 10.53955/Jhcls.V1i2.8.
- [13] U. N. Oktiana, Waluyo, And A. Nugroho, “Pelaksanaan Perlindungan Lahan Pertanian Pangan Berkelanjutan Berdasarkan Regulasi Rencana Tata Ruang,” *J. Discret.*, Vol. 1, No. 1, Pp. 16–24, 2020.
- [14] J. G. J. Saputro, I. G. A. K. R. Handayani, And F. U. Najicha, “Analisis Upaya Penegakan Hukum Dan Pengawasan Mengenai Kebakaran Hutan Di Kalimantan Barat,” *J. Manaj. Bencana*, Vol. 7, No. 1, Pp. 27–36, 2021, Doi: 10.33172/Jmb.V7i1.692.
- [15] F. Wulandari And W. Waluyo, “Efektivitas Pemanfaatan Dana Bagi Hasil Cukai Hasil Tembakau Dalam Bidang Kesehatan Di Kota Surakarta Tahun 2018,” *Bestuur*, Vol. 7, No. 1, P. 15, 2020, Doi: 10.20961/Bestuur.V7i1.28418.
- [16] I. A. Wicaksono And F. U. Najicha, “Penerapan Asas Ultimum Remedium Dalam Penegakan Hukum Pidana Lingkungan Hidup,” *Univ. Bengkulu Law J.*, Vol. 3, No. 1, Pp. 15–22, 2019, Doi: 10.33369/Ubelaj.V3i1.4795.
- [17] H. Izza, N. Fadhila, F. U. Najicha, And U. S. Maret, “Pentingnya Memahami Dan Mengimplementasikan Nilai- Nilai Pancasila Di Lingkungan Masyarakat,” Vol. 4, No. 2, 2021.
- [18] M. A. Al Maghfiroh And F. U. Najicha, “Legal Basis For Taking The Land Owned And Compensation For The Affected Land,” *Untag Law Rev.*, Vol. 5, No. 1, Pp. 39–44, 2021.