Jurnal Pijar MIPA
https://jurnalfkip.unram.ac.id/index.php/JPM

ISSN 1907-1744 (Print)
ISSN 2460-1500 (Online)

Analysis of the Biological Quality of Clean Water in the Laju River, Dompu City

Mulhidin[1*], Sri Wahyuningsih[2]

[1]Department of Environmental Engineering, Mataram Environmental Engineering College, Mataram, Indonesia
[2]Department of Environmental Health, Mataram Environmental Engineering College, Mataram, Indonesia
*e-mail: mulhidin.88@gmail.com

Received: April 15, 2026. Accepted: May 19, 2026. Published: June 23, 2026

Abstract: Water quality in Indonesia has been declining from year to year. One of the bodies of water experiencing declining water quality is the river. The decline in water quality, accompanied by bacterial contamination, contributes to various diseases linked to contaminated water. The Laju River is one of the large rivers located in the heart of Dompu City. The many activities of residents around the river are one of the sources of pollution in the Laju River. The purpose of this study is to determine the presence and number of Coliform bacteria and *Escherichia coli*. This type of research is Qualitative Descriptive research. Laju river water samples were taken from the upstream, middle and downstream sections. Based on the examination results, the highest number of Coliform bacteria was in the middle section of the river, namely 16,800 CFU/ 100 ml, and the highest number of Escherichia coli was in the upstream section of the river, namely 17,000 CFU/100 ml. The number of Coliform and *Escherichia coli* in Laju River water exceeds the value of the Class II River Water Quality Standards set by Government Regulation No. 22 of 2021. Reducing the levels of Coliform and *Escherichia coli* in river water requires a gradual approach, starting with physical treatment and progressing to chemical disinfection. Controlling the levels of *Escherichia coli* and Coliform in water is essential because these bacteria are the main indicators of dangerous pathogen contamination, serve as a standard for water quality suitability, and help detect sanitation damage.

Keywords: Coliform; *Escherichia coli*; Laju River.

Introduction

The most abundant natural resource on Earth is water. Water is the most essential requirement for living things, for hygiene, drinking, and cooking. Water not only supports 70% of the human body but also regulates nutrient levels, aids digestion and metabolism, and helps maintain balance. Therefore, the human body requires approximately 2 to 3 liters of water per day [1].

Water is a basic need for humans and all living things, used for drinking, cooking, bathing, washing, and more. According to Indonesian Government Regulation Number 82 of 2001, water pollution is the introduction of living organisms, substances, energy, and other components into water by human activities, resulting in a decrease in water quality to a level that renders the water unable to function as intended [2].

Rivers are ecosystems that play a vital role in the hydrological cycle and support organisms and populations in the surrounding area. The condition of a river is closely related to the characteristics of its surrounding environment [3]. Rivers play a crucial role in the development of human civilization, particularly providing fertile areas, typically located in river valleys, and providing water as a primary source of life for humans. To this day, rivers remain closely and inseparably linked to daily human life [4]. A river is a place, a container, and a network of river water flowing from highlands to lowlands with the right and left boundaries and the length of its flow by a commensurate line. A river can also be interpreted as part of the earth's surface, a depression in the surrounding land, and a channel for freshwater to flow to the sea. A river can be interpreted as a part of the land where water, springs, or rainfall flow [5].

The Laju River is one of the major rivers in the city of Dompu. The Laju River crosses the eastern and southern parts of the city of Dompu. The Laju River, which crosses the Dompu city area, is 26 km long, with its headwaters in Katua Village and a collection of tributaries, including the Ranggo River, Silo River, Soa River, and Ginte River. The Laju River is used for irrigation, fisheries, livestock, industrial raw materials, and tourism, among other uses [6].

Water is essential to all living things and plays a vital role in the agricultural, industrial, fisheries, household, and recreational sectors, making it an irreplaceable resource. Rivers, as the main source of surface water, are crucial for various purposes but are vulnerable to pollution from human activities, such as the disposal of domestic and industrial waste, which degrades water quality and endangers health and ecosystems [7].

Flowing water sources, such as rivers, are also susceptible to contamination by microorganisms, including bacteria. While cleanliness is significantly different from that of stagnant water like lakes, river water is still susceptible to high levels of coliform bacteria. River water is generally cleaner than lake water because it flows seamlessly from one end point to the other. Rivers flow from their upstream end, which is a spring source from a mountain, to their downstream end, which is a calm estuary, ultimately ending in the sea. This is one reason why dirt (sediments and pollutants) and microorganisms in river water are carried along by the current [8]. Recently, the quality of Laju River water has declined sharply due to pollution from industrial waste, fisheries and livestock, and

How to Cite:
M. Mulhidin and S. Wahyuningsih, “Analysis of the Biological Quality of Clean Water in the Laju River, Dompu City”, *J. Pijar.MIPA*, vol. 21, no. 3, pp. 601–607, Jun. 2026. https://doi.org/10.29303/jpm.v21i3.11888

domestic waste. This can increase the total and faecal Coliform counts and the presence of *Escherichia coli*, an indicator of biological pollution.

Coliform bacteria are pathogenic bacteria, so their presence is commonly found in water. The presence of these bacteria determines whether the water or the sample is contaminated with pathogenic bacteria. The presence of these bacteria is usually caused by contamination, and most Coliform bacteria are found in the intestines of humans and animals. This group of bacteria is rod-shaped, gram-negative, does not form spores, and can ferment lactose to produce acid and gas at 37 degrees Celsius for up to 48 hours. There are two types of Coliform bacteria: faecal and non-faecal. Faecal Coliforms are bacteria derived from human faeces, while non-faecal coliforms are bacteria derived from animal faeces and from dead plants. Examples of fecal Coliforms are *Escherichia coli* bacteria that cause gastrointestinal disorders such as diarrhea, and non-fecal Coliforms are Enterobacter aerogenes bacteria that cause opportunistic diseases such as cancer [9].

Escherichia Coli is a pathogenic bacterium that is a major cause of morbidity and mortality worldwide. *Escherichia coli* is part of the normal flora of the human intestine and can cause disease if it enters other organs or tissues. So *Escherichia Coli* bacteria are the main cause of diarrhea. One type of *Escherichia Coli* bacteria that causes diarrhea, namely *Escherichia Coli*, is an Enterohe-morrhagic group that can cause hemorrhagic disease characterized by bloody diarrhea and Hemolytic Uremic Syndrome (HUS), namely urinary tract infections. *Escherichia Coli* bacterial infection in humans is characterized by a wide range of clinical manifestations, ranging from showing no clinical symptoms or asymptomatic to the appearance of bloody or non-bloody diarrhea. Humans are exposed to Escherichia coli through direct contact with infected animals or by consuming contaminated food and drink [10].

Examination of Escherichia coli and Coliform in the water of the Laju River in Dompu Regency has not been conducted before. This examination is considered important for determining the suitability of the biological parameters of the Laju River water with the established regulations.

Research Methods

The type of Research used is descriptive Qualitative, in which biological water quality testing is carried out, including coliform and Escherichia coli tests on tap water used by students and teachers, and the results will be presented with the research data. This Research was conducted in January 2026. The sampling location was carried out in the Laju River, Dompu Regency and then analyzed at the Mataram City Health Laboratory. Examination of *Escherichia coli* and coliform in water samples using the MPN (Most Probable Number) method. River water samples were collected at 3 points: upstream, middle, and downstream. Sampling was carried out at three river points, determined based on river water characteristics and monitoring objectives: upstream, middle, and downstream.

The materials used in this study include eight river water samples, distilled water, SSL media, TSL, BGLB, and EMB. The tools used in this study are racks, test tubes, measuring cups, round loops, beakers, pipettes, cotton, lightning cups, autoclaves, incubators, aluminium foil, krab paper, digital scales, analyte scales, label paper, Durham tubes, disks, stirring rods, Bunsen burners, matches, vortexes, glass objects and stereo microscopes [11].

Preparation Stage

In this study, the first stage is the preparation of determining the research location. Sampling steps. Prepare the media or sampling container according to the condition of the water source, the container used is rinsed first with the water sample to be taken, sampling is carried out according to needs after that the sample is homogenized evenly into the container, if sampling is carried out at several points then the volume at each sampling point must be the same, the sample that was taken and then taken to the Mataram City Health Testing and Calibration Laboratory Center for identification. Next, provide the tools and materials needed for the research instruments. Continue with the stage of sterilizing the tools and materials to be used, and sterilizing glass and plastic tools using 70% alcohol. Tools made of glass are sterilized again using an autoclave at 121^0C for 15 minutes [12].

Media Creation Stage

To prepare Single Strength Lactose Broth (SSLB), weigh 5.2 grams of SSLB media, dissolve it in 250 ml of distilled water, and transfer the media to a previously labelled Erlenmeyer flask. Making TSL (Triple Strength Lactose) solution weighs 4.7 grams of TSL media by dissolving 250 ml of distilled water, then dissolving the media with distilled water until homogeneous using a water bath, then covering it with cotton, sterilize the media first with an autoclave at a temperature of 12°C for 24 hours [13].

To prepare BGLB (Brillian Green Lactose Bile Broth) media, first prepare the tools and materials, weigh 9.8 grams of BGLB media, place it in a labelled Erlenmeyer flask, and dissolve it in 245 ml of distilled water. Shake until homogeneous. After the BGLB solution is homogeneous using a water bath, after it is homogeneous, cover the BGLB solution with cotton and aluminum foil then sterilize it with an autoclape at a temperature of 121°C for 15 minutes and after that cool the BGLB media and store it in the refrigerator Making EMB (Eosin Methyline Bile) media, weighing the EMBA media as much as 4.9 grams then put it into an Erlenmeyer and dissolve it with 130 ml of distilled water until the media dissolves or is homogeneous, after the solution is homogeneous using a water bath, cover it with cotton and aluminum foil, sterilize the EMB media at a temperature of 121°C for 15 minutes then let it sit first before putting it in the refrigerator [14].

Identification of *Escherichia Coli* and Coliform Bacteria Estimator Test

The first step in the Presumptive test is to prepare a trisalt dilution solution for SSL media. A 10 ml dilution is prepared, and the TSL media is diluted to 10^{-1} to 10^{-6}; the solutions are stirred with a special tool until homogeneous.

30 tubes containing Durham tubes for 1 sample. The next step is to insert 1 ml of the water sample into the 10^{-1} dilution that has been made homogeneous, and then shake the tube to mix until homogeneous. After the water sample is at a dilution of 10^{-1} Mohm, insert 1 mL into the 10^{-2} dilution and follow the first step until the dilution reaches 10^{-6}. After the six dilutions are homogeneous with water, transfer 1 ml of each dilution into a tube. The next step is to incubate the tube at 35°C for 24 hours, the tube that is positive for bacteria will produce bubbles in the Durham tube [15].

Persumie Test

The second stage is to transfer the culture from the positive SSL and TSL tubes, using an inoculation needle, into the tube that already contains 2% BGLB (Brilliant Green Lactose Bile) medium with Durham tubes. The tubes were incubated for 24 hours at 35°C. Positive tubes produced gas in the Durham tubes. The next step was to match the positive tubes with the values in the MPN table to determine the number of Coliform bacteria in the water sample [16].

Estimator Test *Escherichia Coli*

The steps taken in this stage are to transfer the bacterial culture from the positive BGLB tube into a tube containing EC broth with a Durham tube using an incubation needle. The next stage is to incubate the inoculated EC broth tube for 48 hours. After 48 hours of incubation, the results indicate the presence of *Escherichia coli* in the medium [17].

Test of Confirmation *Escherichia coli* and Coliform

In the confirmation test stage for Escherichia coli, EC broth tubes identified as positive were streaked onto EMB (Eosin Methylene Blue) medium using a 3 mm inoculation needle. After the EMB medium was streaked, it was incubated for 24 hours at 35°C. From the results of incubation on EMB media, it was found that there were colonies of *Escherichia coli* bacteria, with characteristics of metallic green, black or dark in the center of the colony [18].

Observation Stage: The observation stage, carried out after incubation for 24 hours at 37°C, was performed on a Petri dish to identify the types of *Escherichia coli* and Coliform bacteria found in the three river water samples. After all tests are complete, the final step is to calculate the number of Coliforms in the water sample. The number of Coliforms in the water sample is calculated using the following formula [19]:

$$\text{Density} = \text{MPN table Values} \times \frac{1}{\text{Dilution value}}$$

Results and Discussion

The Laju River is one of the main rivers in Dompu Regency. The Laju River has eight watersheds. Based on existing conditions, the Laju River's flow is used for agriculture, livestock, and other services. This study was conducted to analyze the water quality in the Laju River using biological parameters. Water in the Laju River is used for agriculture, irrigation, and livestock. Sampling was carried out at three points, namely upstream, middle, and downstream. Sampling must comply with predetermined operational standards (SOP). Inappropriate sampling can affect the results of sample examination.

The Results of the examination of Coliform bacteria and *Escherichia Coli* can be seen in Table 1. Laju River water is classified as Class II under the river water quality standards. Class II water is used for recreational facilities, freshwater fish farming, animal husbandry, and agricultural irrigation. Based on the results table presented above, several samples do not meet the Environmental Health Quality Standard under PP No. 22 Year 2021.

Figure 1. Results of *Escherichia coli* and Coliform examinations on the river water sample

The image above shows that *Escherichia coli* and Coliform bacteria are present in the river water. Escherichia coli are indicated by the color blue, and Coliform bacteria are indicated by the color purple.

Table 1. Result of Biological Quality of Laju River Parameters of Total Coliform

Sample	Total Coliform CFU/100 mL	PP No.22 Year 2021 Class II	Result
Upstream	2,550		Not Eligible
Middle	16,800	1,000 CFU/100 ml	Not Eligible
Downstream	5,660		Not Eligible

Table 2. The result of the Biological Quality of the Laju River parameters of *Escherichia coli*

Sample	*Escherichia Coli* CFU/100 mL	PP No.22 Year 2021 Class II	Result
Upstream	17,000		Not Eligible
Middle	15,000	5,000 CFU/100 ml	Not Eligible
Downstream	16,000		Not Eligible

Biological Quality of Clean Water: Parameters of Total Coliform

Based on the results of the examination at the upstream point, 2,550 CFU/100 mL; in the middle, 1,680 CFU/100 mL; and downstream, 5,660 CFU/100 mL. Rivers are vital freshwater systems crucial to the survival of all living things. Rivers are divided into three zones: the upstream zone, located near the water source; the downstream zone, opposite the upstream zone; and the middle zone, between the upstream and downstream zones. In addition to drinking, rivers serve various purposes in development sectors such as agriculture, industry, transportation, aquaculture, and others [20].

Since ancient times, rivers have also been used for sanitation and disposal purposes. However, today, much industrial, domestic, and agricultural waste is discharged into rivers. This has resulted in a large-scale decline in water quality. This decline in water quality can threaten the continuity of life systems. Rivers in rural areas are less polluted than those in urban areas. The cause of water pollution is the proximity to many sources of pollution, such as domestic wastewater discharge points, industrial waste disposal points, and solid waste disposal sites. Furthermore, agricultural land is common in urban areas. This agricultural land has the negative side of being an additional source of pollution for urban rivers [21].

Coliform bacteria are members of the Enterobacteriaceae family, which includes rod-shaped, gram-negative, facultatively anaerobic bacteria that ferment lactose, producing acid and gas. In general, these bacteria are normal flora found in the intestines of humans and warm-blooded animals, especially in high concentrations in feces. They can also live freely in secondary environments such as water, soil and sediment.

Coliform bacteria are a group of bacteria commonly used as indicators of water quality. While coliforms themselves are not the cause of waterborne diseases, they are easy to culture and can serve as indicators of other pathogenic organisms [22]. Coliform bacteria are excreted from the body daily through feces and are the most dominant bacteria found in water bodies contaminated with organic domestic waste. Therefore, domestic waste pollution can be detected by calculating the density of coliforms carried by human feces into the water [23]. The Coliform prediction test focuses on detecting the presence of this group of bacteria, which can ferment lactose within 48 hours at 37°C, producing acid and gas. The results of this incubation are expressed as total Coliform. Some strains of Coliform can withstand temperatures up to 44.5°C, indicating high adaptability to such conditions. certain environmental conditions [24].

The high total coliform count in the middle river sample, exceeding 16,800 CFU/100 ml, indicates very high coliform contamination. There are many reasons for this coliform contamination of the river water. The first reason is the geographic location of point 3, which is near a pedestrian bridge between the village and a community plantation. This area is prone to being used as a waste dump by local residents and is closer to community plantations than the upstream and downstream areas [25].

Research on e coli examination was also conducted in Sungai Datar Village, Jepara Regency with the examination results it can be seen that there are 3 genera of coli bacteria, including *Escherichia coli* which has the characteristics of round shape, flat edges, convex elevation, metallic green color, Gram negative staining, rod-shaped, pink color cells preparations, positive indole test, and TSIA test base and slopes are yellow. Both bacteria of the Shigella genus had the characteristics of round shape, flat edges, convex elevation, purple color, Gram-negative staining, rod-shaped, pink-colored cell preparations, negative indole test, and yellow base TSIA test, and red slope. Bacteria of the Klebsiella genus with characteristics of round shape, flat edges, convex elevation, pink color, Gram-negative, rod-shaped, pink preparations, negative indole test, and yellow base and slope TSIA test [26].

Another study on Coliform examination in rivers was also conducted in the river waters of Lampung Province, where the test results showed that the highest number of Coliforms was found in River I location, ranging between 25394-24413 JPT/100 mL, and the lowest was found in River VII location, ranging between 8564-12034 JPT/100 mL. The test results showed that the waters of the Lampung Province River were contaminated with Coliform bacteria, exceeding the threshold for class I rivers (1000 Numbers/100 mL) [27].

Biological Quality of Clean Water: Parameters of *Escherichia coli*

River water pollution by *Escherichia coli* bacteria is a serious environmental problem. The Laju River, located in Dompu Regency, is one of the rivers polluted by these bacteria. Contamination with *Escherichia coli* bacteria exceeding quality standards is a major problem in this river and can negatively impact public health and the aquatic ecosystem [28].

The main source of *Escherichia coli* contamination in the Laju River in Dompu Regency is waste from livestock activities, particularly cattle farms. Untreated waste from these farms contains large numbers of pathogenic bacteria that can pollute the river flow [29]. Differences in *Escherichia coli* concentrations in river water samples can be caused by various factors. One of them is the source of pollution that varies along the river. *Escherichia coli* as an indicator of fecal contamination can be found in higher numbers in areas with dense human activity or near sources of domestic waste. Samples with high Escherichia coli concentrations may be affected by pollution from daily activities, such as the direct discharge of domestic waste into the river [30].

Furthermore, geographical factors and land use around the river can affect Escherichia coli concentrations. Samples taken in densely populated areas or areas frequently used for activities such as washing or bathing can show higher concentrations of E. coli. Densely populated areas with houses close to rivers tend to experience more severe pollution because household waste often enters the river directly [31]. Coliform bacteria are divided into two types: faecal Coliform bacteria, such as Escherichia coli, which originate from human and animal waste. *Escherichia coli* bacteria in water can be used as an indicator that the water has been contaminated with feces. There are also non-fecal coliform bacteria, such as Enterobacter aerogenes, which usually originate from dead plants [31]. The three genera that constitute the main groups of coliform bacteria originating from feces are: *Escherichia coli*, Aerobacter, and Klebsiella. Primary species of this coliform group include Bacteroides sp., Lactobacillus sp., Escherichia coli, and Enterococcus sp. Secondary species in this Coliform group include Citrobacter levinea, Klebsiella sp., Enterobacter sp., Clostridium sp., Staphylococcus sp., Bacillus sp., yeast, and mold [33].

Another study on *Escherichia coli* was also conducted in the Maruasey River. The results showed that the Maruasey River experienced significant E. coli contamination, especially around the pig farm. Concentrations of *Escherichia coli* exceeded safe limits at all sampling points, indicating a high public health risk associated with the use of this river water. To address this problem, this study recommends constructing an effective and appropriate Wastewater Treatment Plant (WWTP) on the pig farm. The WWTP is expected to reduce *Escherichia coli* counts and other pollutants before the water is discharged back into the Maruasey River [34].

Water is a good medium for the growth of pathogenic bacteria such as *Escherichia coli*. *Escherichia coli* provides concrete evidence of fecal contamination in water. *Escherichia coli* is a group of bacteria that lives in the lower intestines of warm-blooded animals, including humans. Escherichia coli excreted from the body poses a hazard to soil, sediment, and water. Therefore, *Escherichia coli* in water can indicate the presence of pathogens from animal or human waste. Some possible sources of fecal contamination in water include agricultural runoff, wildlife using water as their natural habitat, runoff from areas contaminated with pet waste, wastewater treatment plants, and on-site septic systems [35].

Areas around the Laju River, such as traditional markets and livestock farms, cause high levels of *Escherichia coli*. Domestic waste from various community activities enters the river, polluting it. Domestic waste is a source of pollutants in water pollution. Testing for *Escherichia coli* and Coliform in river water is crucial for detecting fecal pollution, which serves as a guideline for environmental quality standards. These bacteria indicate the presence of dangerous pathogens, such as Salmonella and Vibrio, that directly affect the quality of aquatic ecosystems and pose a threat to the public through gastrointestinal infections.

Conclusion

Based on the Research that has been conducted, it can be concluded that the biological Quality of the Laju River does not meet the Government Regulation No. 22 of 2021 Concerning Class II River Water Regulations. Based on government regulation no. 22 of 2021, the standard for Coliform bacteria in class II river water is 1,000 CFU/100ml and for *Escherichia coli* is 5,000 CFU/100ml. Based on the results of the coliform content examination in the upstream, downstream and middle sections of the river, the river does not meet the specified requirements, where the Coliform content in the upstream section of the river is 2,550 CFU/100 mL, in the middle section 16,800 CFU/100 mL, and in the downstream section 5,660 CFU/100 mL. Meanwhile, the results of the *Escherichia coli* examination in the river showed 17,000 CFU/100 mL in the upstream section, 15,000 CFU/100 mL in the middle section, and 16,000 CFU/100 mL in the downstream section. The results of the examination are very far from the established standards. It is hoped that the relevant government can educate the public not to dispose of domestic waste directly into the river, and educate livestock owners in the river basin not to dispose of livestock waste into the river. In addition, the construction of a communal wastewater disposal installation (CWDI) is a long-term solution that can reduce Escherichia coli and Coliform levels in river water, as liquid waste from households and communal areas is treated before being released into water bodies.

Author's Contribution

Mulhidin: conducting Analysis and Writing Articles.
S. Wahyuningsih: compiling and designing an analysis

Acknowledgements

We would like to express our gratitude to the Mataram City Regional Health Laboratory for facilitating the examination of the sample. We also extend our gratitude to our colleagues who assisted in this research, whom we cannot mention individually.

References

[1] N. R. Yuni and R. Ekawaty, "Analysis of Irrigation Water Quality in Batang Lampasi," *Sebatik*, vol. 29, no. 2, pp. 216–221, Dec. 2025, doi: 10.46984/sebatik.v29i2.2726.

[2] T. Melinda and N. Nurhidayah, "Analysis of Seawater Quality in Gili Air North Lombok District," *Jurnal Pijar MIPA*, vol. 18, no. 1, pp. 112–117, Jan. 2023, doi: 10.29303/jpm.v18i1.4488.

[3] A. Daramusseng and S. Syamsir, "Studi Kualitas Air Sungai Karang Mumus Ditinjau dari Parameter *Escherichia coli* untuk Keperluan Higiene Sanitasi," *Jurnal Kesehatan Lingkungan Indonesia*, vol. 20, no. 1, pp. 1–6, Apr. 2021, doi: 10.14710/jkli.20.1.1-6.

[4] A. Suriadikusumah, O. Mulyani, Sudirja, E. T. Sofyan, M. H. R. Maulana, and A. Mulyono, "Analysis of the Water Quality at Cipeusing River, Indonesia Using the Pollution Index Method," *Acta Ecologica Sinica*, vol. 41, no. 3, pp. 177–182, 2021, doi: 10.1016/j.chnaes.2020.08.001.

[5] M. Verawaty, N. Apriani, L. Tarigan, E. T. Aprian, W. C. Laurenta, and Muharni, "Antibiotics Resistant *Escherichia coli* Isolated from Aquatic Ecosystems in Palembang, South Sumatra, Indonesia," *Biodiversitas*, vol. 21, no. 1, pp. 86–97, 2020, doi: 10.13057/biodiv/d210113.

[6] K. Wibisono, "Monitoring Kinerja DAS Bedadung Kabupaten Jember, Jawa Timur," *Jurnal Geografi*, vol. 18, no. 1, pp. 52–59, 2021, doi: 10.15294/jg.v18i1.25964.

[7] P. Wulandari and A. Pristiyaningrum, "Analisis Cemaran Mikroba *E. coli* dan Total Koliform pada Depot Air Minum Isi Ulang: Studi Kasus di Pulo Gadung, Jakarta Timur," *Jurnal Kesehatan*

Lingkungan Indonesia, vol. 24, no. 3, pp. 317–324, Oct. 2025, doi: 10.14710/jkli.73503.

[8] I. S. Joyosemito, S. S. Meilani, and M. Azmi, "Evaluating Environmental and Public Health Risks of Medical Waste Incineration Using Air Dispersion Modeling in Indonesia," *Jurnal Kesehatan Lingkungan Indonesia*, vol. 24, no. 3, pp. 258–268, Oct. 2025, doi: 10.14710/jkli.68740.

[9] D. Yuliansari, E. Fatmalia, and W. Wahyudin, "Biological Quality of Drilled Well Water Around the Shrimp Paste Production Place in Jor Village, East Lombok District," *Jurnal Pijar MIPA*, vol. 18, no. 4, pp. 626–631, Jul. 2023, doi: 10.29303/jpm.v18i4.5255.

[10] F. Junaeny and D. Darmanto, "Policy Evaluation of the Community-Based Water and Sanitation Program (PAMSIMAS) in Tana Tidung, North Kalimantan: A Qualitative Study," *Jurnal Kesehatan Lingkungan Indonesia*, vol. 24, no. 3, pp. 338–350, Oct. 2025, doi: 10.14710/jkli.74125.

[11] N. Nurhidayah, H. Sholehah, and J. Al-Qarni, "The Analysis of Filtration Efficiency to Reduce BOD and COD Levels in Domestic Waste at the Communal WWTP of Bilebante Village, Pringgarata District, Central Lombok," *Jurnal Pijar MIPA*, vol. 19, no. 3, pp. 535–539, May 2024, doi: 10.29303/jpm.v19i3.6818.

[12] N. Aisyah, L. Zulkifli, and D. A. C. Rasmi, "Isolation of Endophytic Bacteria and Fungi from Soursop (*Annona muricata* L.) and Bioactivity Test as Antimicrobial Against *Escherichia coli*, *Staphylococcus epidermidis*, and *Candida albicans*," *Jurnal Pijar MIPA*, vol. 18, no. 2, pp. 254–259, Mar. 2023, doi: 10.29303/jpm.v18i2.3834.

[13] Z. Zairinayati, N. A. Maftukhah, S. Sabrina, and R. D. Anggraini, "Bioremediasi Limbah Cair Rumah Tangga Menggunakan Eco Enzim Fermentasi Kulit Buah," *Jurnal Kesehatan Lingkungan Indonesia*, vol. 24, no. 3, pp. 363–372, Oct. 2025, doi: 10.14710/jkli.74082.

[14] D. Ramadhan, S. Indah, and D. Helard, "Strategi Pengelolaan Air Limbah Domestik di Kawasan Permukiman Hulu Sungai Kelurahan Hutaimbaru Kota Padangsidimpuan," *Jurnal Kesehatan Lingkungan Indonesia*, vol. 22, no. 3, pp. 274–281, Oct. 2023.

[15] R. Faradila, H. S. Huboyo, and A. Syakur, "Rekayasa Pengolahan Air Limbah Domestik dengan Metode Kombinasi Filtrasi untuk Menurunkan Tingkat Polutan Air," *Jurnal Kesehatan Lingkungan Indonesia*, vol. 22, no. 3, pp. 342–350, Oct. 2023, doi: 10.14710/jkli.22.3.342-350.

[16] S. F. Zahro and S. Adityosulindro, "Literature Review: Penggunaan Bahan Berbasis Limbah Sebagai Adsorben untuk Degradasi Zat Warna pada Air Limbah," *Jurnal Kesehatan Lingkungan Indonesia*, vol. 22, no. 3, pp. 359–368, Oct. 2023, doi: 10.14710/jkli.22.3.359-368.

[17] H. Herniwanti and D. K. Ray, "Evaluating the Sanitary Hygiene of Drinking Water Depots in Pekanbaru City," *Jurnal Kesehatan Lingkungan Indonesia*, vol. 21, no. 3, pp. 335–343, Oct. 2022, doi: 10.14710/jkli.21.3.335.

[18] E. D. Wunda, T. Melinda, and H. Sholehah, "Clean Water Processing Through a Filtration System Using a Multimedia Filter on River Water in Babak Village, West Lombok Regency," *Jurnal Pijar MIPA*, vol. 20, no. 8, pp. 1537–1545, Dec. 2025, doi: 10.29303/jpm.v20i8.11047.

[19] T. Abdullah, A. Azwaruddin, and S. Wahyuningsih, "Analysis of the Biological Quality of Clean Water in the Taha Quran Education Park," *Jurnal Pijar MIPA*, vol. 20, no. 8, 2026, doi: 10.29303/jpm.v20i8.10988.

[20] T. Melinda and M. Majdi, "Analysis of the Water Quality of Padolo River, Bima District," *Jurnal Pijar MIPA*, vol. 20, no. 8, pp. 1526–1531, Dec. 2025, doi: 10.29303/jpm.v20i8.11019.

[21] A. N. Rahmawati, D. W. Utami, D. Saryanti, and B. Kurniaaji, "Analisis Most Probable Number (MPN) Coliform dan *Escherichia coli* pada Air Sumur Bor di Pemukiman Warga Kelurahan Pucangsawit Surakarta," *Jurnal Kesehatan Lingkungan Indonesia*, vol. 23, no. 2, pp. 146–152, Jun. 2024.

[22] A. Azwaruddin, T. Abdullah, and S. Wahyuningsih, "Clean Water Quality Analysis Based on Chemical Parameters at the Taha Qur'an Education Park Bima Regency," *Health Journal Karya Kesehatan*, vol. 12, no. 2, pp. 320–326, Apr. 2024, doi: 10.33394/hjkk.v12i2.11321.

[23] C. O. Handayani, H. Zu'amah, and Sukarjo, "Human Health Risk Assessment of Heavy Metals in the Serayu River Water, Central Java, Indonesia," *Jurnal Kesehatan Lingkungan*, vol. 17, no. 2, pp. 110–119, Apr. 2025, doi: 10.20473/jkl.v17i2.2025.110-119.

[24] S. Supardiono, R. N. Rahayu, and N. Nurhidayatullah, "Integrative Approach to Evaluation of Physical, Chemical and Biological Parameters: Analysis of Mujur River Water Quality," *Jurnal Pijar MIPA*, vol. 19, no. 3, pp. 547–552, May 2024, doi: 10.29303/jpm.v19i3.6786.

[25] R. Asyfiradayati, "Evaluation of Adulticidal Chlorine with Black Sand, White Sand and Silica Sand for Decline Coliform Bacteria," *Jurnal Kesehatan Lingkungan*, vol. 17, no. 3, pp. 268–276, Jul. 2025, doi: 10.20473/jkl.v17i3.2025.268-276.

[26] A. Udijono, "Students' Habits and Identification of Bacteria on Inanimate Surface of Educational Setting," *Jurnal Kesehatan Lingkungan*, vol. 16, no. 4, pp. 360–367, Oct. 2024, doi: 10.20473/jkl.v16i4.2024.360-367.

[27] T. N. B. Tengku Ibrahim, "Klang River Water Quality Assessment and Its Effects on Human Health Using Chemometric Analysis," *Jurnal Kesehatan Lingkungan*, vol. 16, no. 2, pp. 125–136, Apr. 2024, doi: 10.20473/jkl.v16i2.2024.125-136.

[28] Y. Umbu, T. Melinda, and M. Majdi, "Analysis of the Water Quality of the Iwan River in Darmaji Village, Kopang District, Central Lombok Regency," *Jurnal Pijar MIPA*, vol. 20, no. 1, pp. 40–45, Jan. 2025, doi: 10.29303/jpm.v20i1.8038.

[29] T. Zubaidah, S. Hamzani, and A. Arifin, "Analyzing the Impact of Dissolved Organic Components on River Water Quality and Its Implications for Human Health: A Case Study from Banjar District," *Jurnal Kesehatan Lingkungan*, vol. 16, no. 2, pp. 181–189, Apr. 2024, doi: 10.20473/jkl.v16i2.2024.181-189.

[30] S. S., R. Rostina, and U. A. Billah, “Analisis Kualitas Air Sumur di RW 05 Kelurahan Banta-Bantaeng Kota Makassar,” *Sulolipu*, vol. 25, no. 2, pp. 324–329, Nov. 2025, doi: 10.32382/sulo.v25i2.1776.
[31] A. Amyati and N. Wijayanti, “Quality of Water Based on Microbiological Testing in Traditional Market,” *Food Health Journal*, vol. 9, no. 3, pp. 240–246, Nov. 2022, doi: 10.33746/fhj.v10i03.349.
[32] S. Arlinda, S. Suksmerri, M. Mukhlis, and Mahaza, “Risk Analysis of Community Water Quality in Alahan Panjang Agricultural Area, Solok Regency, West Sumatra, Indonesia,” *Jurnal Kesehatan Lingkungan*, vol. 14, no. 3, pp. 193–200, Jul. 2022.
[33] T. Imadudin, Z. Husnina, and R. Adriyani, “Household Sanitation as a Diarrhea Driving Factor of Under-Five Children in Bojonegoro Regency,” *Jurnal Kesehatan Lingkungan*, vol. 13, no. 4, pp. 199–203, Oct. 2021, doi: 10.20473/jkl.v13i4.2021.199-203.
[34] S. Rachma, R. Adriyani, Z. Husnina, and S. S. Farumi, “Literature Review: Water Quality of Public Bathing, Potential Health Problems and Water Borne Diseases on Visitors,” *Jurnal Kesehatan Lingkungan*, vol. 13, no. 2, pp. 102–112, Apr. 2021, doi: 10.20473/jkl.v13i2.2021.102-112.
[35] U. S. Matlubah, “Uji Bakteri Coliform dan *Escherichia coli* pada Sampel Air Minum Menggunakan Metode Filtrasi dan Total Plate Count (TPC),” *Jurnal Kesehatan Ilmiah Indonesia*, vol. 9, no. 2, Dec. 2024, doi: 10.51933/health.v9i2.1713.