

THE INFLUENCE OF BABAR SARI WATER QUALITY IN PLANNING ECO-TECH-EDU TOURISM AL AMIN LIVING LAB AND INDUSTRIAL PARK

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Abstract. Rivers are places, containers, and networks of water irrigation from springs to estuaries. The existence of rivers with their nature that flows from upstream to downstream has the potential for opportunity value and externality effects between upstream and downstream or along river flows (Pangesti, 2000). Eco-Tech-Edu Tourism Combination and integration of learning across applicable programs, the flow of the Babarsari river looks clear and flows well, so this is used in the construction of living labs and industrial parks. In its use as ecotourism, it is necessary to analyze the burden of pollutants. In determining the burden of pollutants, it is necessary to carry out water analysis and water status analysis based on the Decree of the Minister of Environment no. 115 of 2003 concerning guidelines for water quality status.

Keywords: Babar Sari; Raw water sources; Water quality

INTRODUCTION

Rivers are places, containers, and networks of water irrigation from springs to estuaries. The existence of rivers with their nature that flows from upstream to downstream has the potential for opportunity value and externality effects between upstream and downstream or along river flows (Pangesti, 2000). The use of river flows is carried out by local communities for various purposes, from agriculture to settlements (Darmanto and Sudarmadji, 2013). The construction of settlements that follow the pattern of river flow can be caused when the land for settlement is increasingly difficult to find this is because the physical conditions in the area are not suitable for settlement which will result in prone to landslides caused by floods (Hakki et al., 2015). In addition, the use of rivers carried out by the community with various activities will cause problems

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related to environmental sustainability, cleanliness, and decreased water quality. The decline in environmental quality around the river is caused by various things, including the disposal of industrial waste and household waste, garbage, and community habits. This kind of behavior is not supportive of a clean environment that will reduce the quality of the environment (Nasikin Muhammad, 2007).

UNPAB is currently developing a use plan for 10 ha and is expected to cultivate a total of 20 ha of land. In this planning, UNPAB involves all study programs (Prody) that are in its hands. Basic Concepts The development of the land meets the needs of learning, practicum, research, and innovation centers of UNPAB which can become an income generator. Living Lab or Panca Budi Science EcoPark Glugur Rimbun (PSE-GR) has 4 main themes: 1. Tri Dharma of UNPAB Higher Education 2. Eco-Tech-Edu Tourism 3. Fitrah-based education (Islam) 4. Symbiosis of economic mutualism. Eco-Tech-Edu Tourism Combination and integration of learning across applicable programs, the flow of the Babarsari river looks clear and flows well, so this is used in the construction of living labs and industrial parks. In use as an edu-tours, it is necessary to analyze the burden of pollutants. In determining the burden of pollutants, it is necessary to carry out water analysis and water status analysis based on the Decree of the Minister of Environment no. 115 of 2003 concerning guidelines for water quality status.

LITERATURE REVIEW

Raw Water Source

Raw water is water that will be used as a source / raw material in the drinking water supply system (Law No. 82 of 2004). The water must meet certain criteria to be processed into drinking water that is suitable for consumption. In Government Regulation No. 82 of 2004 concerning water quality management and water pollution control, water is classified according to its quality into four classes, namely:

- a. Class 1, water whose designation can be used for raw drinking water, and or other designations that require the same water quality as that user.
- b. Class 2, water whose designation can be used for water recreational infrastructure/ facilities, freshwater fish farming, animal husbandry, water for irrigating gardening, and or other purposes that require the same water quality as these uses.

- c. Class 3, is water whose designation can be used for freshwater fish farming, animal husbandry, water for irrigating gardening, and or other purposes that require the same water as that user.
- d. Class 4, water whose designation can be used to irrigate gardening, and or other designations that require the same water quality as that user.

Water Quality Standards

Clean water is water that is used for daily purposes and will become drinking water after being cooked first. As a limitation, clean water is water that meets the requirements for the drinking water supply system, where the requirements in question are requirements in terms of water quality which include physical, chemical, biological, and radiological quality so that if consumed it does not cause side effects (Government Regulation Number 21 of 2022 concerning the Implementation of Environmental Protection and Management). The requirement also pays attention to the security of the clean water distribution system from clean water installations to consumers. Drinking Water Drinking water is defined as water that goes through a treatment process or without a treatment process that meets health requirements and can be directly drunk, the difference between clean water quality and drinking water is the quality standard of each maximum allowable physical, chemical, and radiological parameter.

Requirements for Providing Clean/Drinking Water

1. Quantitative Requirements This means that the raw water source used must be able to meet the large clean/drinking water needs service areas and can be used without having difficulty getting them. The amount of clean/drinking water that can be consumed depends on the amount of raw water available and the capacity of the clean/drinking water treatment plant that operates.
2. Qualitative Requirements i.e. Physical Parameters, Chemical And Biological Parameters.

RESEARCH METHOD(S)

The water sampling location of the Babarsari River is determined by considering and paying attention to the rivers that are expected to be affected by activity activities. Water sampling was carried out at 2 location points. As for the location:

1. W01 (LAT 3°26'48.28"N ; LONG 98°31'9.81"E)
2. W02 (LAT 3°26'34.94"N ; LONG 98°31'1.67"E)



Figure 1. Sampling Location



Figure 2. Research Methods

The quality standards tested are as follows:

- Total Dissolved Solid (TDS). Represents a measure of the total ions in solution. Water containing more than 500 mg/l will cause a salty taste. (AWWA, 1998 p 2.7)
- pH is a term used to express the intensity of the acidic or alkaline state of a solution. In the provision of water.
- Biological Oxygen Demand (BOD) is the quantity of dissolved oxygen needed to completely decompose organic matter contained in water using measures of biological and chemical processes that occur in water.
- Chemical Oxygen Demand (COD) Chemical Oxygen Demand is the measurement of oxygen equivalent of organic and organic materials in water samples capable of oxidase by strong oxidizing chemicals.
- Dissolved oxygen or DO (Dissolved oxygen) is the amount of dissolved oxygen in water derived from photosynthesis and atmospheric / air absorption.

- Dissolved oxygen in water plays a very important role in the process of food absorption by living things in the water.

The data needed for the study of changes in surface water quality is the water quality of the Babarsari River. In addition, data is also needed on the planned activities of Al Amin Living Lab and Industrial park which will result in changes in river water quality in the study area, as well as the quality and discharge of wastewater generated as a result of the activity. Data on the water quality of rivers in the study area are obtained using direct measurements in the field and analysis in the laboratory. The quality standard used is annexed VI of Government Regulation Number 21 of 2022 concerning the Implementation of Environmental Protection and Management class II, namely water whose designation can be used as a means of water recreational infrastructure. A man in the planning of the Living Lab, it is intended to use Babarsari quality water as a water tour.

FINDINGS AND DISCUSSION

Table 1. Babarsari Water Laboratory Test Results

No	Parameters	Unit	Test Results *)		Quality Standards **)
			Location 1	Location 2	
1	TDS	mg/l	48,7	52,5	1000
2	pH		7,03	7,19	6-9
3	BOD	mg/l	40,7	38,6	3
4	COD	mg/l	83,53	70,68	25
5	DO	mg/l	4,04	4,29	4

Source: Sucofindo Lab Test Results

*) W01 (LAT 3°26'48.28"N ; LONG 98°31'9.81"E ; W02 (LAT 3°26'34.94"N ; LONG 98°31'1.67"E

**) Government Regulation Number 21 of 2022 Class II Appendix VI

From the results, it can be seen that the quality standard by the quality standard is only pH. Meanwhile, the TDS, BOD, COD, and DO parameters are still above the quality standards. Sampling was done during drizzling rain and there had been raining a few days earlier.

Based on Table 1, COD levels are higher than BOD levels. Bod and COD levels were 83.53 mg / L and 40.7 mg / L, respectively organic in such water. The value of COD is always higher than that of BOD, this is because many organic substances are chemically oxidized but cannot be biologically oxidized.

pH is one factor that must be considered considering that the acidity of the water will affect the processing activity, for example in carrying out chemical coagulation, disinfection, water softening, and in the prevention of corrosion. The results of the laboratory test provide information that the pH of Babarsari water is still normal, this means that the water has not been polluted.

The BOD value does not indicate the actual amount of organic matter, but only measures the relative amount of oxygen needed to oxidize the waste material. If the oxygen consumption is high which is indicated by the smaller residual dissolved oxygen.

The decomposition of organic waste materials through the oxidation process by microorganisms in environmental water is a natural process that easily occurs when environmental water contains sufficient oxygen. The higher the BOD value indicates the higher the activity of organisms to decompose organic matter or it can be said that the greater the content of organic matter in water. Therefore, high levels of BOD can reduce the amount of dissolved oxygen in water. When the dissolved oxygen content in environmental water decreases, the ability of aerobic bacteria to break down organic waste materials also decreases. When the dissolved oxygen has run out, the aerobic bacteria may die. In these circumstances, anaerobic bacteria will take over the task of breaking down organic waste materials in the environmental water. The result of breakdown by anaerobic bacteria produces an unpleasant odor e.g. rancidity or rot.

The COD number is a measure of water pollution by organic substances that can naturally be oxidized through the process of microorganisms and result in reduced dissolved oxygen in the water.

CONCLUSION AND RECOMMENDATION

The quality of Babarsari Water by quality standards is only pH. Meanwhile, the TDS, BOD, COD, and DO parameters are still above the quality standards.

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