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Analysis of River Environmental Pollution Factors

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Abstract: The problem of polluted river water quality is part of current environmental problems. A lot of pollution is caused by industrial factory waste, household waste, and rubbish. This causes the condition of the river ecosystem to decline and hurts humans and the environment. Pollution that occurs in rivers is a result of human behavior which increasingly ignores the surrounding environment. The consequences of human behavior that is wrong in treating the river environment will ultimately become a disaster that is detrimental to humans themselves. This research aims to detect whether there is a correlation between knowledge and attitudes held by the community regarding behavior to protect the river environment. The hypothesis proposed in this study is: that behavior to maintain the health of the river environment is influenced by knowledge and attitude variables. The sample in this research was 300 students. The influence of knowledge on behavior has a significant relationship with a p-value of 0.00. The influence of attitudes on behavior has a significant relationship with a p-value of 0.00. There is positive behavior to protect river ecosystems and also environmental sustainability in rivers, but there are also students who behave indifferently towards the environment and tend to be indifferent.

Keywords: Analysis; Pollution Factors; River Environmental

Introduction

Environmental pollution, especially river waters, by heavy metals is not only a national but also an international problem (Mitra et al., 2022; Mohammad Ali et al., 2021). Heavy metal pollution can come from industrial or natural activities (Masindi & Muedi, 2018; Yan et al., 2018). Water pollution can be in the form of salts of heavy metals and heavy metals which form toxic compounds (Balali-Mood et al., 2021; Zhang et al., 2023). Heavy metals that are often found in water pollution are Hg, Pb, Cd, Cr, Cu, Ni, and Zn in the form of toxic compounds. Water is one of the components needed for human life. All creatures need water for life and other purposes. The availability of water in terms of quality and quantity is necessary, especially water that comes from rivers. River water pollution can be caused by various things.

One of the causes of river water pollution is human activity which creates residential waste (garbage) or household waste (Garg et al., 2018). Community activities around river banks will of course affect the quality of river water, due to waste produced from community activities being discharged directly into river waters and exceeding the river's ability to clean itself (self-purification), which will cause serious problems, namely water pollution ran, so that the life of aquatic biota and the health of the people who use the river water will be disturbed (Mushtaq et al., 2020).

Residential waste contains domestic waste in the form of organic and inorganic waste as well as detergents (Abdel-Shafy & Mansour, 2018; Melati et al., 2020). Organic waste is waste that can be broken down or decomposed by bacteria, for example: leftover vegetables, fruit, and leaves (Fadlilla et al., 2023; Lolo et al., 2023; Novianti & Muliarta, 2021). Rubbish These inorganics cannot be broken down by bacteria (non-biodegradable), for example, paper, plastic, glass, cloth, wood, metal, rubber, and leather. Apart from organic and inorganic waste, detergent is the residential waste that has the most potential to pollute water (Azizullah et al., 2021; Chen et al., 2022). The reality is that currently, almost all households use detergent.

The quality of the environment and community behavior will determine the level of community health (Chakraborty et al., 2021; Fu et al., 2020; Marlia et al.,

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2022). Furthermore, a person's health status will affect their quality of life and productivity which will ultimately affect their well-being (Babapour et al., 2022). Rapid population growth has had many negative impacts on water resources, both quantity and quality. Meanwhile, some residents do not receive water services, but on the other hand, there are activities and activities of residents who use water excessively and tend to cause water waste.

Results of research and monitoring by various universities, related agencies, and environmentally concerned communities (NGOs); show that pollution in some 13 rivers and their tributaries that divide the capital have exceeded the threshold limit with waste content increasing downstream and towards the estuary. The waste content originating from industrial and household waste is gradually causing shallowing and narrowing of rivers (Ayilara et al., 2020). Shallowing often causes flooding because the ability (capacity) of rivers to drain rainwater into the sea begins to decrease. The behavior of communities and industrialists in disposing of waste and feces into rivers is a source causing environmental pollution of river waters (Atmono et al., 2021; Ranjith & Sherla, 2022; Sanda & Ibrahim, 2020), so that rivers experience shallowing and narrowing which results in more Floods continuing to occur because the carrying capacity of rivers to accommodate and channel rainwater to the sea has begun to decrease. So there is a correlation between river environmental pollution and flooding.

Method

The data collection method was carried out using a survey. The survey method was carried out based on a list of questions (questionnaire) and researchers went directly into the field to distribute or distribute questionnaires to 300 students. This research is an exploratory descriptive study with a "cross-sectional" approach, where the Independent Variables (knowledge and attitudes) and Dependent Variables (behavior) are collected at the same time.

Result and Discussion

Analysis

The results of the frequency test analysis can be seen in the research below, where more than 50% of respondents have demonstrated good knowledge about how to make good efforts to maintain the health of the river environment. Respondents already know the importance of keeping rivers and the environment clean (Anderson et al., 2019; Hua & Chen, 2019). Apart from that, more than half of the respondents also showed a positive attitude and if we look at their behavior, they also showed more positive attitudes. As for bad behavior, of course, it correlates with their knowledge and attitude toward efforts to maintain environmental health.

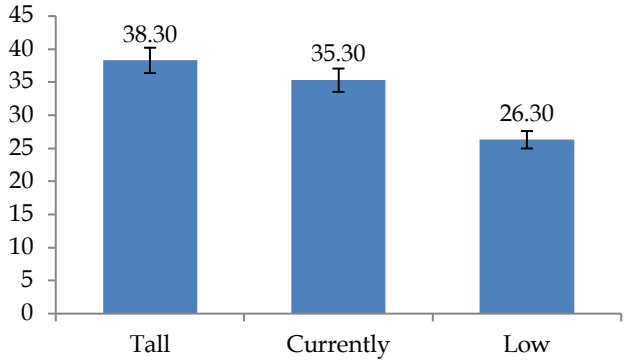

Figure 1. Dominant respondent knowledge

Judging from the graph above, it is found that the dominant respondents (38%) have high knowledge about the river environment. Respondents who had moderate knowledge were found to be 35.30%. Meanwhile, respondents who had low knowledge were 1.40%

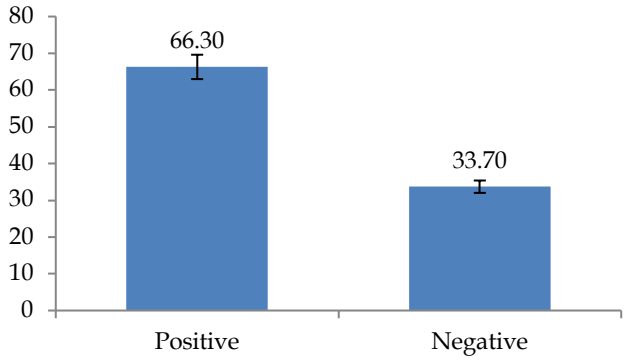

Figure 2. Dominant respondent attitude

Judging from the graph above, it is found that the dominant respondents (66.30%) have a positive attitude about the river environment. Meanwhile, respondents who had a negative attitude were 33.70%.

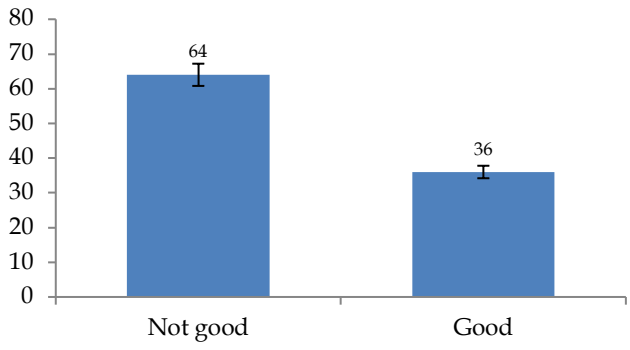

Figure 3. Dominant respondent Action

Judging from the graph above, it is found that the dominant respondents (64%) have good behavior towards the river environment. Meanwhile, 36% of respondents who had unfavorable behavior People's attitudes are influenced by their level of knowledge. Attitudes influence a person's behavior, but they are not automatically realized in action because there are other supporting factors needed, including facilities, experience, motivation, and environment states that attitude is a tendency to respond negatively or positively to an object using a persuasive approach, both individual and societal models.

In other words, to change people's attitudes, a persuasive approach is needed by individuals or institutions as examples of success for society Community behavior in using rivers currently still triggers various kinds of pollution, causing pollution to the river environment itself (Manisalidis et al., 2020). Tarakan City Regional Environmental Status Data stated that the water quality of the Karang Anyar River in Tarakan City, namely the COD, ammonia, and TSS parameters in 2010-2013 exceeded the quality standards. The decline in water quality is caused by the behavior of people who live in riverbank areas pollution of the river environment due to people's unhygienic behavior also causes the water quality of the Blukar River to be polluted (Syafri et al., 2020).

This is because the condition and quality of the Blukar river water is influenced by the influx of wastewater from its catchment area which is influenced by the behavioral patterns of the surrounding community. People still think that rivers are an appropriate and easy means to use for various activities, such as bathing, washing clothes, and even defecation (Avelar Portillo et al., 2023; Deb et al., 2021; Grimes et al., 2015). Communities, in this case, are residents who use the Blukar River water as a place to bathe, wash, and defecate, the behavior of farmers in the area around the river in using fertilizers and pesticides, and industrial communities who dispose of production wastewater into the Blukar river. Apart from that, it is necessary to increase coordination between agencies related to controlling water pollution.

Water pollution is a change in conditions in a water reservoir such as lakes, rivers, oceans and groundwater due to human activities (Glavan, 2018). Lakes, rivers, oceans and groundwater are an important part of the human life cycle and are one part of the hydrological cycle. Its various functions really help human life. Meanwhile, the biggest benefits of lakes, rivers, oceans and groundwater are for agricultural irrigation, raw materials for drinking water, as drainage channels for rainwater and wastewater, and even have the potential to become tourist attractions (Balaram et al., 2023; Cheng et al., 2022). In PP No. 20/1990 concerning Water Pollution Control, water pollution is defined as: "Water pollution is the entry or entry of living creatures, substances, energy, and other components into water by human activities so that the quality of the water decreases to a certain limit (Huzaeni & Basri, 2023). which causes water to no longer be useful according to its intended purpose.

Water pollution occurs in water sources such as lakes, rivers, seas and groundwater caused by human activities (Hassan Al-Taai, 2021; Khatri & Tyagi, 2015; Lin et al., 2022). Water is said to be polluted if it cannot be used according to its function. Although sometimes natural phenomena, such as volcanic eruptions, very rapid weed growth, storms and earthquakes are the main causes of changes in water quality, these phenomena cannot be blamed for causing water pollution. This pollution can be caused by industrial, residential, agricultural, household, industrial waste and fishing using poison (Briffa et al., 2020; Oluseun & Adebukola, 2021). The source of river pollution is that it comes from industrial waste discharge. According to (Lemessa et al., 2023; Pratiwi et al., 2023), pollution caused by This industrial waste discharge causes River water quality pollution takes the form of: Decrease in oxygen (O_2) content dissolves into water bodies; Increased water turbidity and water color; High PH levels and increasing toxicity (poisoning).

Conclusion

The behavior of communities around river banks, such as toilet activities and throwing household waste directly into the river, has an impact on river water quality. The Sekanak River, a tributary of the Musi River in Palembang City, has experienced pollution which can be seen in the physical changes in river water and the results of water quality tests by the Palembang City DLHK.

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Author Contributions
Conceptualization, E. Y., Y. A., A.; methodology, E. Y.; validation, Y. A. and.; A. formal analysis, E. Y.; investigation, Y. A and A.; resources, E. Y. and. Y. A; data curation, A: writing—original draft preparation, E. Y. and Y. A.; writing—review and editing, A..: visualization, E. Y. and Y. A. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest
The authors declare no conflict of interest.

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