

***Monitoring Water Quality of the Yellow River in Sambisari Hamlet,
Purwomartani Village, Sleman Regency***

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ABSTRACT

Background: *The Kuning River in Sambisari Hamlet, Purwomartani Village, Sleman Regency is utilized by the community for daily activities and aquaculture. Domestic and fish farming activities may decrease river water quality due to the discharge of organic materials, nutrients, and pathogenic microorganisms into the water body. Therefore, water quality monitoring is needed to determine the condition of the Kuning River based on physical, chemical, and microbiological parameters.*

Objective: *To determine the water quality of the Kuning River in Sambisari Hamlet, Purwomartani Village, Kalasan District, Sleman Regency based on physical, chemical, microbiological parameters and water quality status using the Pollution Index (PI) method.*

Method: *This study used a descriptive quantitative survey design. Water samples were collected using the grab sampling method at upstream and downstream points with two repetitions. The examined parameters included TSS, DO, BOD, COD, nitrate, ammonia, total phosphate, and fecal coliform. The results were compared with Class II river water quality standards based on Government Regulation Number 22 of 2021 and analyzed using the Pollution Index method according to the Decree of the Minister of Environment Number 115 of 2003.*

Results: *From upstream to downstream, TSS increased from 10 mg/L to 12 mg/L, DO from 7.5 mg/L to 7.55 mg/L, BOD from 1.1 mg/L to 1.15 mg/L, ammonia from 0.149 mg/L to 0.375 mg/L, and total phosphate from 1.07 mg/L to 1.14 mg/L. In contrast, COD decreased from 12.8 mg/L to 11.7 mg/L, nitrate from 5.9 mg/L to 5.38 mg/L, and fecal coliform from 4.815×10^5 MPN/100 mL to 1.265×10^5 MPN/100 mL. Total phosphate concentrations at both sampling points exceeded the Class II water quality standard of 0.2 mg/L, while fecal coliform concentrations exceeded the Class II standard of 1,000 MPN/100 mL. The parameters TSS, DO, BOD, COD, nitrate, and ammonia met the Class II water quality standards. The Pollution Index value at the upstream point was 10.36, indicating heavily polluted water, while the downstream point had a Pollution Index value of 8.31, indicating moderately polluted water.*

Conclusion: *The water quality of Kuning River at the study location has been polluted, with a heavily polluted status at the upstream point 10.36 and a moderately polluted status at the downstream point 8.31. The pollution was primarily indicated by total phosphate and fecal coliform concentrations that exceeded the Class II river water quality standards.*

Keywords: *Kuning River, Water Quality, Pollution Index*

PEMANTAUAN KUALITAS AIR SUNGAI KUNING DI DUSUN SAMBISARI KALURAHAN PURWOMARTANI KABUPATEN SLEMAN

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INTISARI

Latar Belakang: Sungai Kuning di Dusun Sambisari Kalurahan Purwomartani Kabupaten Sleman dimanfaatkan masyarakat untuk kegiatan sehari-hari dan budidaya perikanan. Aktivitas domestik dan budidaya ikan berpotensi menurunkan kualitas air sungai akibat masuknya bahan organik, nutrisi, dan mikroorganisme patogen ke badan air. Oleh karena itu, diperlukan pemantauan kualitas air untuk mengetahui kondisi mutu air Sungai Kuning berdasarkan parameter fisika, kimia, dan mikrobiologi.

Tujuan: Mengetahui kualitas air Sungai Kuning di Dusun Sambisari Kalurahan Purwomartani Kapanewon Kalasan Kabupaten Sleman berdasarkan parameter fisika, kimia, mikrobiologi, dan status mutu air menggunakan metode Indeks Pencemaran (IP).

Metode: Jenis penelitian ini adalah survei deskriptif kuantitatif. Pengambilan sampel dilakukan menggunakan metode grab sampling pada titik *upstream* dan *downstream* dengan dua kali pengulangan. Parameter yang diuji meliputi TSS, DO, BOD, COD, nitrat, amonia, total fosfat, dan fecal coliform. Hasil pemeriksaan dibandingkan dengan baku mutu air sungai kelas II berdasarkan PP RI Nomor 22 Tahun 2021 dan dianalisis menggunakan metode Indeks Pencemaran berdasarkan Kepmen LH Nomor 115 Tahun 2003.

Hasil: Dari titik *upstream* ke *downstream* terjadi peningkatan nilai TSS dari 10 mg/L menjadi 12 mg/L, DO dari 7,5 mg/L menjadi 7,55 mg/L, BOD dari 1,1 mg/L menjadi 1,15 mg/L, amonia dari 0,149 mg/L menjadi 0,375 mg/L, dan total fosfat dari 1,07 mg/L menjadi 1,14 mg/L. Sebaliknya, COD menurun dari 12,8 mg/L menjadi 11,7 mg/L, nitrat dari 5,9 mg/L menjadi 5,38 mg/L, dan fecal coliform dari $4,815 \times 10^5$ MPN/100 mL menjadi $1,265 \times 10^5$ MPN/100 mL. Parameter total fosfat pada kedua titik pengamatan melebihi baku mutu kelas II sebesar 0,2 mg/L, sedangkan parameter fecal coliform melebihi baku mutu kelas II sebesar 1.000 MPN/100 mL. Parameter TSS, DO, BOD, COD, nitrat, dan amonia masih memenuhi baku mutu air sungai kelas II. Nilai Indeks Pencemaran (IP) pada titik *upstream* sebesar 10,36 dengan status mutu air cemara berat, sedangkan pada titik *downstream* sebesar 8,31 dengan status mutu air cemara sedang.

Kesimpulan: Kualitas air Sungai Kuning pada lokasi penelitian telah mengalami pencemaran dengan status mutu cemara berat pada titik *upstream* 10,36 dan cemara sedang pada titik *downstream* 8,31. Pencemaran terutama ditunjukkan oleh parameter total fosfat dan fecal coliform yang melebihi baku mutu air sungai kelas II.

Kata Kunci: Sungai Kuning, Kualitas Air, Indeks Pencemaran