



KAJIAN PENGARUH BUANGAN LIMBAH CAIR BATIK TERHADAP KUALITAS AIRTANAH BEBAS DI KAMPUNG BATIK

GIRILOYO, KAPANEWON IMOGIRI, KABUPATEN BANTUL, DAERAH ISTIMEWA YOGYAKARTA

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ABSTRAK

Kampung Batik Giriloyo merupakan sentra industri batik yang berkembang pesat di Kabupaten Bantul. Namun, aktivitas pembuangan limbah cair batik yang tidak seluruhnya melalui proses pengolahan berpotensi mencemari airtanah bebas, yang menjadi sumber utama air bersih masyarakat setempat. Penelitian ini bertujuan untuk: (1) mengidentifikasi karakteristik limbah cair batik dan airtanah bebas di Kampung Batik Giriloyo, (2) menganalisis pengaruh spasial pembuangan limbah cair batik terhadap kualitas airtanah bebas dengan pendekatan flownet dan parameter kualitas air, serta (3) merumuskan strategi pengelolaan lingkungan untuk pengendalian pencemaran airtanah akibat aktivitas industri batik.

Penelitian ini menggunakan pendekatan deskriptif dengan metode survei dan pengukuran laboratorium. Data dikumpulkan melalui total sampling pada seluruh titik sumber limbah cair batik dan sumur warga yang dipilih berdasarkan arah aliran airtanah (flownet). Parameter kualitas air yang diuji meliputi BOD, COD, amonia ($\text{NH}_3\text{-N}$), kromium (Cr), fenol, dan sulfida (S), mengacu pada Perda DIY No. 7 Tahun 2016 dan Pergub DIY No. 20 Tahun 2008. Analisis spasial dilakukan untuk memetakan sebaran pencemaran dengan metode *interpolasi Inverse Distance Weighted* (IDW).

Hasil penelitian menunjukkan bahwa beberapa parameter limbah cair batik melebihi baku mutu, dan terdapat indikasi kuat bahwa airtanah bebas di hilir aliran tercemar oleh aktivitas pembuangan limbah cair batik, khususnya pada sumur-sumur yang berada searah flownet. Sebaran spasial kontaminasi memperkuat hubungan antara lokasi industri batik, arah aliran airtanah, dan konsentrasi pencemar. Berdasarkan temuan ini, disusun strategi pengelolaan lingkungan yang meliputi pendekatan teknis (IPAL komunal), peningkatan kesadaran masyarakat, serta penguatan regulasi dan pengawasan lingkungan.

Penelitian ini menunjukkan bahwa pendekatan spasial dan hidrogeologis secara terpadu penting untuk mengidentifikasi dan mengendalikan pencemaran airtanah di kawasan industri rumah tangga seperti Kampung Batik Giriloyo.

Kata kunci: limbah cair batik, pencemaran airtanah bebas, flownet, analisis spasial, strategi pengelolaan lingkungan

**ASSESSMENT OF THE IMPACT OF BATIK WASTEWATER DISCHARGE
ON UNCONFINED GROUNDWATER QUALITY IN KAMPUNG BATIK
GIRILOYO, IMOGIRI SUBDISTRICT, BANTUL REGENCY,
SPECIAL REGION OF YOGYAKARTA**

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ABSTRACT

Kampung Batik Giriloyo is a rapidly developing batik industry center in Bantul Regency. However, the discharge of untreated batik wastewater poses a potential threat to unconfined groundwater, which serves as the main source of clean water for the local community. This research aims to: (1) identify the characteristics of batik wastewater and unconfined groundwater in Kampung Batik Giriloyo, (2) analyze the spatial impact of batik wastewater discharge on unconfined groundwater quality using a flownet approach and water quality parameters, and (3) formulate environmental management strategies for controlling groundwater pollution caused by batik industry activities.

This study employed a descriptive approach with survey methods and laboratory analysis. Data were collected through total sampling of all active batik wastewater discharge points and groundwater wells selected based on the groundwater flow direction (flownet). The water quality parameters tested included BOD, COD, ammonia (NH₃-N), chromium (Cr), phenol, and sulfide (S), referring to Regional Regulation of Yogyakarta Special Region No. 7/2016 and Governor Regulation No. 20/2008. Spatial analysis was conducted to map the distribution of contamination using the Inverse Distance Weighted (IDW) interpolation method.

The findings indicate that several batik wastewater parameters exceed quality standards, and there is strong evidence that downstream unconfined groundwater is contaminated, especially in wells aligned with the groundwater flow direction. The spatial distribution of contaminants confirms the relationship between batik production locations, groundwater flow patterns, and pollutant concentrations. Based on these findings, an environmental management strategy was formulated, encompassing technical interventions (communal WWTPs), public awareness initiatives, and strengthened environmental regulations and monitoring.

This research highlights the importance of integrating spatial and hydrogeological approaches to identify and mitigate groundwater contamination in small-scale industrial zones such as Kampung Batik Giriloyo.

Keywords: batik wastewater, unconfined groundwater pollution, flownet, spatial analysis, environmental management strategy