

ANALISIS HUBUNGAN AKTIVITAS PERTANIAN TERHADAP KUALITAS AIRTANAH DI KALURAHAN SINDUMARTANI, KABUPATEN SLEMAN DAN KALURAHAN SIDOMULYO, KABUPATEN BANTUL

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INTISARI

Airtanah merupakan sumber utama penyedia air bersih bagi masyarakat perdesaan, tetapi keberadaannya rentan terhadap pencemaran akibat aktivitas manusia, salah satunya kegiatan pertanian. Penelitian ini bertujuan untuk menganalisis kualitas airtanah serta pola spasial sebaran parameter dan menilai pengaruh aktivitas pertanian terhadap perubahan kualitas airtanah di Kalurahan Sindumartani, Kabupaten Sleman, dan Kalurahan Sidomulyo, Kabupaten Bantul.

Penelitian ini menggunakan dua jenis data, yaitu data primer dan data sekunder. Data primer yang diperoleh berupa informasi penggunaan pupuk, kedalaman TMA airtanah, dan kualitas airtanah di kedua lokasi kajian melalui proses wawancara dengan informan kunci, pengukuran langsung di lapangan, dan pengujian laboratorium. Sampel airtanah yang diambil sebanyak sembilan titik di masing-masing kalurahan dengan kategori sebelum, saat, dan setelah lahan pertanian. Data spasial dianalisis berdasarkan arah aliran airtanah dari hulu ke hilir dan dikaitkan dengan penggunaan lahan pertanian di sekitarnya. Sementara itu, data sekunder yang diperlukan digunakan dalam pembuatan peta aliran airtanah dan penentuan titik pengambilan sampel airtanah.

Hasil penelitian menunjukkan bahwa sebagian besar parameter kimia masih memenuhi baku mutu berdasarkan Peraturan Gubernur DIY Nomor 20 Tahun 2008, Peraturan Pemerintah Nomor 22 Tahun 2021, dan Peraturan Kementerian Kesehatan Nomor 2 Tahun 2023. Namun, terdapat beberapa parameter yang mendekati dan melebihi baku mutu, yaitu fosfat, nitrat, dan nitrit di Kalurahan Sindumartani yang mencapai nilai tertinggi di titik hilir C3. Sementara itu, Kalurahan Sidomulyo memiliki parameter yang melebihi baku mutu, yaitu kalium, fosfat, nitrat, dan amonia dengan nilai tertinggi di titik C6. Pola spasial menunjukkan adanya akumulasi zat terlarut dari hulu ke hilir seiring aliran airtanah. Aktivitas pertanian menunjukkan adanya kontribusi terhadap perubahan kualitas airtanah, terutama melalui penggunaan pupuk. Namun, kontribusi tersebut tidak sebesar dari aktivitas antropogenik di permukiman atau dapat dikatakan limbah domestik lebih berkontribusi, khususnya detergen. Hasil wawancara dengan ketua kelompok tani dan penyuluh lapangan menunjukkan bahwa pupuk NPK dan urea digunakan secara rutin dengan dosis yang konsisten. Perbandingan antar wilayah menunjukkan bahwa Kalurahan Sidomulyo lebih rentan terhadap pencemaran airtanah dibandingkan Sindumartani yang dipengaruhi oleh kondisi geologi, kedalaman airtanah, dan karakteristik akuifer.

Kata kunci: airtanah, kualitas air, aktivitas pertanian, pencemaran, pupuk

ANALYSIS THE IMPACT OF AGRICULTURAL ACTIVITIES ON GROUNDWATER QUALITY IN SINDUMARTANI VILLAGE, SLEMAN REGENCY AND SIDOMULYO VILLAGE, BANTUL REGENCY

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ABSTRACT

Groundwater is the primary source of clean water for rural communities, but it is vulnerable to pollution from human activities, including agriculture. This study aims to analyze groundwater quality and the spatial distribution of parameters, and assess the impact of agricultural activities on changes in groundwater quality in Sindumartani Village, Sleman Regency, and Sidomulyo Village, Bantul Regency.

This study used two types of data: primary and secondary data. Primary data consisted of information on fertilizer use, groundwater level depth, and groundwater quality at both study sites through interviews with key informants, direct field measurements, and laboratory testing. Groundwater samples were collected at nine points in each village, categorized as before, during, and after agricultural land use. Spatial data were analyzed based on the direction of groundwater flow from upstream to downstream and related to surrounding agricultural land use. Meanwhile, the necessary secondary data were used to create groundwater flow maps and determine groundwater sampling points.

The results of the study indicate that most chemical parameters still meet the quality standards based on the Governor of the Special Region of Yogyakarta Regulation Number 20 of 2008, Government Regulation Number 22 of 2021, and the Ministry of Health Regulation Number 2 of 2023. However, there are several parameters that approach and exceed the quality standards, namely phosphate, nitrate, and nitrite in Sindumartani Village, which reached the highest value at the downstream point C3. Meanwhile, Sidomulyo Village has parameters that exceed the quality standards, namely potassium, phosphate, nitrate, and ammonia with the highest value at point C6. Spatial patterns indicate the accumulation of dissolved substances from upstream to downstream along the groundwater flow. Agricultural activities have shown a contribution to changes in groundwater quality, especially through the use of fertilizers. However, this contribution is not as large as from anthropogenic activities in settlements or it can be said that domestic waste contributes more, especially detergents. The results of interviews with the head of the farmer group and field extension workers indicate that NPK and urea fertilizers are used routinely with consistent doses. Comparison between regions shows that Sidomulyo Village is more vulnerable to groundwater pollution than Sindumartani, which is influenced by geological conditions, groundwater depth, and aquifer characteristics.

Keywords: agriculture, contamination, fertilizer, groundwater, water quality