

## THE CORRELATION OF GREEN OPEN SPACE WITH AMBIENT DUST LEVELS AIR IN YOGYAKARTA CITY

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### ABSTRACT

**Background:** *The dust pollution level in Yogyakarta City has reached 60  $\mu\text{g}/\text{m}^3$ , exceeding the established regulatory limits. Green Open Spaces (RTH) can reduce urban pollutants (dust levels) by 5% to 69%. However, the total RTH area in Yogyakarta City is only around 18.6%, which is below the required standard. This is due to the conversion of open land into built-up areas.*

**Objective:** *To determine the distribution of dust levels and the relationship between the presence of Green Open Spaces (RTH) and dust concentration in ambient air in Yogyakarta City.*

**Method:** *This research is an analytical observational study using a cross-sectional approach. The number of research objects consists of 20 samples in each group. The independent variable is the presence of Green Open Spaces, while the dependent variable is the concentration of dust in ambient air.*

**Results:** *The average dust concentration in non-RTH areas was 0.0728 grams/ $\text{m}^3$ , which is higher than in RTH areas at 0.0198 grams/ $\text{m}^3$ , and exceeds the established air quality standards. Based on the Independent Samples t-Test, the result showed an Asymp. Sig of 0.000 ( $<0.05$ ), indicating a significant difference in the mean dust concentration between the non-RTH and RTH groups.*

**Conclusion:** *The presence of vegetation in green open spaces (GOS) plays a role in dust reduction through two processes: adsorption and absorption. These processes are more effective in trees with broad, dense leaves and numerous branches compared to trees with narrow and sparse leaves. Statistically, there is a significant relationship between dust levels in non-GOS areas and those in GOS areas.*

**Keywords:** *Air Pullotions, Dust Pullotions, Green Open Space, Mapping*

# HUBUNGAN KEBERADAAN RUANG TERBUKA HIJAU (RTH) TERHADAP KADAR DEBU PADA UDARA AMBIEN DI KOTA YOGYAKARTA

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## INTISARI

**Latar Belakang** : Cemaran kadar debu di Kota Yogyakarta mencapai  $60 \mu\text{g}/\text{m}^3$  termasuk melebihi peraturan yang telah ditetapkan. Ruang Terbuka Hijau dapat mereduksi polutan (kadar debu) di kawasan perkotaan sebesar 5 %-69 %. Ruang Terbuka Hijau di Kota Yogyakarta hanya memiliki luasan sekitar 18,6% dan dikategorikan belum memenuhi standar yang sudah ditetapkan. Hal ini disebabkan oleh konversi lahan terbuka menjadi kawasan bangunan.

**Tujuan** : Untuk mengetahui sebaran kadar debu dan hubungan keberadaan Ruang Terbuka Hijau (RTH) terhadap kadar debu pada udara ambien di Kota Yogyakarta

**Metode** : Penelitian ini merupakan penelitian observasional analitik dengan pendekatan *Cross Sectional*. Jumlah obyek penelitian sebanyak 20 sampel pada masing-masing kelompok. Variabel bebas dalam penelitian ini adalah keberadaan Ruang Terbuka Hijau (RTH). Variabel terikat penelitian ini yaitu konsentrasi kadar debu pada udara ambien.

**Hasil** : Rata-rata konsentrasi kadar debu di kawasan *non* RTH sebesar  $0,0728 \text{ gram}/\text{m}^3$  dan cenderung lebih tinggi dibanding konsentrasi kadar debu di kawasan RTH yang sebesar  $0,0198 \text{ gram}/\text{m}^3$  dan tergolong melebihi baku mutu yang telah ditetapkan. Berdasarkan *Independent Samples t-Test* diperoleh hasil *Asym Sig* 0,000 ( $<0,05$ ) yang artinya terdapat perbedaan rerata konsentrasi kadar debu pada kelompok *non* RTH dan kelompok RTH.

**Kesimpulan** : Tingginya kadar debu di kawasan *non* RTH lebih tinggi daripada di kawasan RTH dikarenakan keberadaan vegetasi di RTH melalui proses penangkapan debu yaitu penjerapan (*adsorpsi*) dan penyerapan (*absorpsi*). Secara statistik terdapat hubungan yang signifikan antar kelompok kadar debu di kawasan *non* RTH dan kawasan RTH.

**Kata kunci** : Pencemaran udara, kadar debu, RTH, pemetaan