Dinamika Fluks Emisi Gas Karbon Dioksida Tanah dengan Perbedaan Persentase Tutupan Kanopi Vegetasi di Ekosistem Hutan Kota Cijantung, Jakarta Timur = Dynamics of Soil Carbon Dioxide Gas Emission Flux with Different Percentage of Vegetation Canopy Cover in Cijantung Urban Forest Ecosystem, East Jakarta

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Abstrak

Hutan kota di Jakarta memiliki peran penting dalam mengurangi dampak negatif pemanasan global dengan menyerap emisi gas karbon dioksida (CO2) atmosfer yang dihasilkan dari aktivitas antropogenik manusia dan menyimpannya di dalam tanah. Penelitian ini bertujuan untuk menganalisis dinamika fluks emisi CO2 tanah pada perbedaan persentase tutupan kanopi vegetasi di Ekosistem Hutan Kota Cijantung, Jakarta Timur dan menganalisis hubungan antara suhu udara, suhu tanah, kelembapan tanah, dan derajat keasaman (pH) tanah dengan fluks emisi CO2 tanah. Metode penelitian melibatkan penggunaan Chamber-Based untuk mengambil CO2 tanah, yang kemudian diukur menggunakan Gas Chromatograph Shimadzu 2014. Chamber ditempatkan pada tiga kondisi stasiun: tutupan kanopi vegetasi terbuka (0%–30%), setengah terbuka (31%–60%) dan tertutup (61%–100%). Pengukuran parameter lingkungan dilakukan untuk setiap lokasi pengambilan emisi CO2 tanah dan dianalisis korelasinya menggunakan Spearman-rho. Hasil penelitian menunjukkan rata-rata fluks emisi CO2 tanah di stasiun setengah terbuka (1,443–5,050 g CO2 m-2hari-1) lebih besar daripada stasiun terbuka (0,747–3,376 g CO2 m-2hari-1) dan tertutup (1,243–2,518 g CO2 m-2hari-1). Namun, ketika dianalisis menggunakan uji Kruskal-Wallis tidak terdapat perbedaan signifikan antara fluks emisi CO2 tanah terhadap persentase tutupan kanopi vegetasi (0%–30%), (31%–60%) dan (61%–100%). Terdapat hubungan antara suhu tanah (r = -0,263) dan pH tanah (r = 0,233) dengan fluks emisi CO2 tanah, sedangkan suhu udara (r = -0,082) dan kelembapan tanah (r = -0,195) tidak memiliki hubungan dengan fluks emisi CO2 tanah. Hasil ini menyoroti kompleksitas interaksi antara faktor-faktor lingkungan dan aliran emisi gas CO2 tanah di Hutan Kota.

.....Urban forests in Jakarta play a crucial role in mitigating the negative impacts of global warming by absorbing atmospheric CO2 emissions from anthropogenic activities and storing them in the soil. This study aims to analyze the dynamics of soil CO2 emission fluxes based on varying percentages of canopy cover in the Cijantung Urban Forest Ecosystem, East Jakarta, and to examine the relationships between air temperature, soil temperature, soil moisture, and soil pH with soil CO2 emission fluxes. The research methodology involved using a Chamber-Based method to collect soil CO2, which was then measured using a Shimadzu 2014 Gas Chromatograph. Chambers were placed in three station conditions: open canopy cover (0%–30%), semi-open (31%–60%), and closed (61%–100%). Environmental parameters were measured at each CO2 emission sampling location, and their correlations were analyzed using Spearman-rho correlation analysis. The results showed that the average soil CO2 emission flux at the semi-open (1.443–5.050 g CO2 m-2day-1) was higher than at the open (0.747–3.376 g CO2 m-2day-1) and closed (1.243–2.518 g CO2 m-2day-1). However, the Kruskal-Wallis test revealed no significant differences between soil CO2 emission flux and vegetation canopy cover percentage (0%–30%), (31%–60%) and (61%–100%). Soil temperature (r = -0.263) and soil pH (r = 0.233) were related to soil CO2 emission flux, while air temperature (r = -0.082)

and soil moisture ($r = -0.195$) were not. These results highlight the complexity of interactions between environmental factors and soil CO_2 gas emission flows in Urban Forests