

# **IMPACT OF URBAN GREEN AREAS ON PARTICULATE MATTER CONCENTRATIONS (PM<sub>1</sub>, PM<sub>2.5</sub>, AND PM<sub>10</sub>).**

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**INTRODUCTION:** Urbanization has significantly contributed to the intensification of air pollution through atmospheric emissions originating from industrial activities, the expansion of vehicular fleets, and other urban dynamics. This scenario demands urgent interventions from public authorities to safeguard population health. International research has demonstrated the positive impact of green areas in urban conglomerates on both air quality and urban thermal comfort. Nevertheless, in Brazil, studies on the influence of urban green areas on air quality remain incipient and are predominantly focused on large metropolitan areas. Additionally, fixed-station air quality monitoring presents spatial and temporal limitations. In this context, remote sensing technologies (satellite data) and low-cost sensors have increasingly been adopted in various regions worldwide as complementary tools for monitoring air quality. These sensors enable real-time estimation of atmospheric pollutant concentrations and are publicly accessible.

**KEY-WORD:** Air pollutants; urban green areas; low-cost sensors

**OBJECTIVE:** To investigate the influence of urban green areas on the levels of particulate matter (PM<sub>1</sub>, PM<sub>2.5</sub>, and PM<sub>10</sub>) in medium-sized Brazilian cities using low-cost sensor data.

**MATERIALS AND METHODS:** Data on particulate matter concentrations (1 µm, 2.5 µm, and 10 µm) were extracted in spreadsheet format from low-cost sensors deployed in medium-sized cities for air quality monitoring throughout 2024. The percentage of green areas in each city was calculated using the Normalized Difference Vegetation Index (NDVI), obtained via Google Earth Engine for the same period. Both air quality and NDVI data were spatially analyzed using QGIS version 3.28.10.

**RESULTS AND CONCLUSION:** The results revealed that cities with higher green area indices presented lower levels of particulate matter. However, further research is required to assess whether variations in vegetation density across urban green areas may differentially influence the reduction of atmospheric pollutants.

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