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Effect of street trees on microclimate and air pollution in a tropical city

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Abstract

One of the fastest growing cities in India, Bangalore is facing challenges of urban microclimate change and increasing levels of air pollution. This paper assesses the impact of street trees in mitigating these issues. At twenty locations in the city, we compare segments of roads with and without trees, assessing the relationship of environmental differences with the presence or absence of street tree cover. Street segments with trees had on average lower temperature, humidity and pollution, with afternoon ambient air temperatures lower by as much as 5.6 °C, road surface temperatures lower by as much as 27.5 °C, and SO₂ levels reduced by as much as 65%. Suspended Particulate Matter (SPM) levels were very high on exposed roads, with 50% of the roads showing levels approaching twice the permissible limits, while 80% of the street segments with trees had SPM levels within prescribed limits. In an era of exacerbated urbanization and climate change, tropical cities such as Bangalore will have to face some of the worst impacts including air pollution and microclimatic alterations. The information generated in this study can help appropriately assess the environmental benefits provided by urban trees, providing useful inputs for urban planners.

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Keywords

Climate change; Sustainability; Tree plantation; Urban forests; Urban heat islands

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