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**A study of the correlation between local meteorology and atmospheric particulate matter in Kandy and Battaramulla in Sri Lanka**

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Air pollution due to particulate matter (PM) remains a significant environmental concern, especially in urban areas. This study examines the relationship between PM concentrations and meteorological parameters of two locations Kandy and Battaramulla, Sri Lanka, during 2020. Hourly data from ambient air quality monitoring stations were analyzed, focusing on PM<sub>2.5</sub> and PM<sub>10</sub> levels, along with ambient temperature, solar radiation, precipitation, and wind speed. The Pearson correlation in R software was employed to quantify the linear relationships. In Kandy, PM<sub>2.5</sub> showed a very weak positive correlation with ambient temperature and solar radiation, and PM<sub>10</sub> exhibited weak positive correlations with all meteorological parameters except precipitation, indicating that higher levels of observed meteorological factors may be associated with slightly increased PM<sub>2.5</sub> concentrations. In contrast, PM<sub>2.5</sub> in Battaramulla showed a weak negative correlation with wind speed, ambient temperature, solar radiation, and precipitation, indicating that higher wind speeds might be associated with slightly lower PM<sub>2.5</sub> concentrations, while PM<sub>10</sub> showed weak negative correlations with ambient temperature, solar radiation, and rainfall, implying that higher values of these meteorological parameters might be associated with slightly lower PM<sub>10</sub> concentrations. These statistically insignificant correlations suggest that meteorological factors have a limited influence on PM concentrations in both locations. Further research and in-depth analyses are recommended to comprehensively understand the complex interactions between PM and local weather patterns to develop effective air quality strategies for the existing PM issues in Kandy and Battaramulla.

**Keywords:** Air Pollution, Air Quality Monitoring, Meteorological Factors, Particulate Matter (PM), Urban Areas