



PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON APPLIED AND PURE SCIENCES

ICAPS 2023

"Sustainable Development through the Advancement of Science and Technology"

13th OCTOBER 2023

**Faculty of Science
University of Kelaniya
Sri Lanka**



MO-22	Selecting suitable locations to establish a ground solar farm in Trincomalee District in Sri Lanka using GIS T. S. M. Senadeera, W. M. J. Y. Bandara, H. M. A. Herath and J. M. M. S. Ariyawansa	144
MO-23	Implementing an Automated Personal Name Authority File for Enhanced Information Retrieval in Sri Lankan Library Online Public Access Catalogues P. L. Wanigasooriya and R. W. P. De Silva	145
MO-24	A study of the correlation between local meteorology and atmospheric particulate matter in Kandy and Battaramulla in Sri Lanka P. M. Batuwita, R. A. W. Ranawaka Arachchi, P. U. Santhiyago, J. J. M. A. D. Jayasundara and G. Naveendrakumar	146
MO-25	Investigation of gelatin and sodium alginate as gelling agents for emulsion gel polymerization of styrene under reduced temperature M. P. J. Fernando and M. Maddumaarachchi	147
MO-26	Impact of Wastewater Treatment Plant on the Quality of Water in the Canals Passing Through Kurunegala City S. A. P. T. Samaraweera and M. M. M. Najim	148
MO-27	GIS based multicriteria analysis for flood hazard assessment: A case study from Walawe River basin, Sri Lanka C. V. Gallage, A. A. S. G. Wijesundera, K. C. Kodithuwakku, W. S. B. Wickramasingha, V. P. A. Weerasinghe	149
MO-28	Spatial distribution of soil and water quality in Eldeniya - East grama niladhari division P. E. P. S. Deraniyagala, H. M. D. S. D. Heenkenda and R. C. L. de Silva	150
MO-29	Development of energy briquettes using <i>Schleichera oleosa</i> (Ceylon oak) wood, <i>Oryza sativa</i> (rice husk, rice straws and rice brain) and <i>Saccharum officinarum</i> (bagasse) K. D. A. Dulanjana, M. M. Udawatta, P. D. A. Prasad, T. P. Bodaragama and D. S. M. De Silva	151
MO-30	Mosquito detection and repellent system using acoustics signals for household use. S. V. Senanayake, C. B. Warnakulasooriya, A. L. A. K. Ranaweera and K. M. D. C. Jayathilaka	152
MO-31	Quantification and health risk assessment of cadmium and lead content in skin creams sold in the Sri Lankan market. E. M. N. S. Senarathne and E. M. R. K. B. Edirisinghe	153

Abstract No: MO-24

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

P. M. Batuwita^{1*}, R. A. W. Ranawaka Arachchi², P. U. Santhiyago², J. J. M. A. D. Jayasundara² and G. Naveendrakumar¹

¹Department of Bio Science, Faculty of Applied Science, University of Vavuniya, Sri Lanka

²Air Resource Management and Monitoring Unit, Central Environmental Authority, Sri Lanka
piyumibatuwita@gmail.com*

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_{2.5} and PM₁₀ 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_{2.5} showed a very weak positive correlation with ambient temperature and solar radiation, and PM₁₀ 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_{2.5} concentrations. In contrast, PM_{2.5} 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_{2.5} concentrations, while PM₁₀ 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 PM₁₀ 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