

Spatial and Temporal Variation of Atmospheric Quality through Analysis of Rainwater: A Comparative Study of Kandy, Peradeniya, and Horana, Sri Lanka

D. A. K. L. Perera¹, N. Priyantha^{2*}

¹*Department of Environmental and Industrial Sciences, University of Peradeniya, Peradeniya, Sri Lanka*

²*Department of Chemistry, University of Peradeniya, Peradeniya, Sri Lanka*

**namal.priyantha@yahoo.com*

Water molecules present in the atmosphere, when condensed under gravitational force, result in wet precipitation, while the transfer of particles in the absence of rain events is dry precipitation. During the earlier process, raindrops capture various pollutants that circulate in the atmosphere and transfer them to the ground and water bodies. The quality of both wet and dry precipitations thus affects environmental quality, and hence it is important to regularly monitor the quality of the precipitation, although this exercise has not been given due attention. In this context, this study emphasizes the monitoring of the quality of precipitation at three sampling sites: Kandy Zonal Education Department (KEZ), University of Peradeniya (UOP), and Kulupana-Horana area (KUH), representing semiurban and urban areas. These three sites show 85%, 85%, and 90% wet precipitation, and an average rainfall of 31.82 mm, 32.95 mm, and 64.25 mm, respectively, during the sampling period from 13th of April 2025 to 18th January 2026. Average pH values

of 6.40, 6.81 and 6.41, and average total hardness values of 19.40 mg L⁻¹, 13.71 mg L⁻¹ and 13.53 mg L⁻¹ were determined for the KEZ, UOP and KUH sites, respectively. The average electrical conductivities were 32.31 μ S cm⁻¹, 30.73 μ S cm⁻¹ and 20.34 μ S cm⁻¹, average TDS values were 22.73 mg L⁻¹, 21.59 mg L⁻¹ and 14.20 mg L⁻¹, and the average salinity levels were 0.018 μ g L⁻¹, 0.016 μ g L⁻¹ and 0.012 μ g L⁻¹ for the same three sites, respectively. The KEZ site, being in an urban area, shows higher ionic content due to vehicular and other emissions, and further, the total hardness is also high due to particulate matter discarded from construction sites and other activities. The study should be continued to determine the anionic, cationic, and trace metal contents, to elaborate on mitigative measures to minimize harmful emissions.

Keywords:

Horana, Kandy, physicochemical parameters, rainwater, University of Peradeniya (UOP)