

Assessing the Suitability of Groundwater for Drinking Purpose in Paddanichupuliyankulam, Veppankulam and Nelukkulam in Vavuniya Divisional Secretariat Division

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The groundwater is the primary source for drinking purposes in Vavuniya, which is located in northern part of Sri Lanka. Agricultural over application of Nitrogen fertilizers and rapid urbanization are the main causes for the contamination of drinking water supplies. 50 borehole wells located in Veppankulam, Nelukkulam and Paddanichupuliyankulam in Vavuniya Divisional Secretariat Division were assessed for selected physio-chemical parameters such as pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Hardness, Calcium, Magnesium, Nitrate (as NO₃⁻) and Phosphate. The objective of this study was to assess the suitability of groundwater for drinking purpose based on the Sri Lanka Standards for potable water of SLS 614: 2013. In this study pH, EC and TDS were measured on the field, the Ultraviolet Spectrophotometric Screening Method was used for the detection of Nitrate and Phosphate concentrations, and Calcium and Magnesium were analyzed using Atomic Absorption Spectrophotometer. Nitrate, EC, TDS, Total Hardness, Calcium and Magnesium exceeded the maximum permissible levels in 70%, 96%, 42%, 80%, 53% and 100% of wells, respectively and the values varied in the ranges of 2.1 — 222 mg L⁻¹, 462 — 8240 μS cm⁻¹, 323 - 7480 mg L⁻¹, 172 - 1408 mg L⁻¹, 56 - 419 mg L⁻¹ and 114 - 989 mg L⁻¹, respectively. Phosphate concentrations were below the maximum permissible level in all the wells and varied from 0.01 to 0.68 mg L⁻¹. The pH was within the standard range in all the wells and varied from 6.97 to 8.35.

Keywords: Water quality analysis, Groundwater, Potable water, Total hardness