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Assessment of Groundwater Quality in Attaragoda Grama Niladhari Division in Galle, Sri Lanka

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Abstract

Insufficient quality can make water unfit for a range of human purposes. As a result, water is becoming scarcer globally as population growth continues. Water quality assessment is essential for effective water resource management. The present research fills the gap in scientific knowledge and information regarding the groundwater quality status in Attaragoda Grama Niladhari (GN) Division in Galle, Sri Lanka. Randomly selected 33 groundwater samples were collected from 142/A Attaragoda GN division monthly from November 2021 to March 2022. Together, 13 selected general water quality parameters, including temperature, pH, total dissolved solids, electrical conductivity, salinity, dissolved oxygen, biological oxygen demand, total nitrate, total phosphate, total alkalinity, total hardness, ammonia, and fluoride, were measured once a month during the study period using standard methodologies. Additionally, four metals, including Iron, Calcium, Magnesium, and Sodium, were analysed for the randomly selected 15 locations during the study period. Statistical analysis was done using Minitab 17 and MS Excel 13. Weighted Arithmetic Water Quality Index (WQI) was calculated using electrical conductivity, TDS, pH, hardness, phosphate, alkalinity, and nitrate parameters in Attaragoda GND. Results indicated that, except for Fe, none of the tested parameters exceeded the maximum permissible levels for drinking water throughout the study. Accordingly, all locations were categorized as good for drinking purposes. For a more precise evaluation of water quality, the WQI can be improved by future research focusing on heavy metal and microbial contaminants.

Keywords: Groundwater, Water quality, Weighted arithmetic water quality index