

**CRITICAL EVALUATION OF RESERVOIR HYDROGEOCHEMISTRY IN
CHRONIC KIDNEY DISEASE OF UNCERTAIN ETIOLOGY (CKDu)
PRONE AREAS OF WILGAMUWA AND HASALAKA, SRI LANKA**

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Over the last three decades, Chronic Kidney Disease of Uncertain Etiology (CKDu) has gained attention as a health problem, particularly in the dry zone of Sri Lanka. The disease is believed to be associated with drinking water quality. Man-made water collecting reservoirs (tanks) with different scale are common in the dry zone region that are primary use for domestic and irrigation purposes. For this study, two adjacent regions with high and low prevalence of CKDu were used to compare the reservoir water quality. Key geochemical parameters and chlorophyll-a concentrations were analysed in reservoirs from Wilgamuwa ($n = 6$), a region with high CKDu prevalence, and Hasalaka ($n = 4$), a low-prevalence area, across both the dry and wet seasons. The study showed increased values of electrical conductivity (EC), total dissolved solids (TDS), NO_3^- and PO_4^{3-} concentrations in all reservoirs during dry periods. The average EC and TDS in Wilgamuwa (89.4-163.0 $\mu\text{S}/\text{cm}$ and 64.2-117.8 mg/L) were higher than in Hasalaka (56.9-70.6 $\mu\text{S}/\text{cm}$ and 40.6-49.0 mg/L). The average total alkalinity levels in all Hasalaka reservoirs and only one reservoir in Wilgamuwa were below 50 mg/L, while others were above 70 mg/L. Approximately four-fifths of samples ($n = 8$) had higher average concentrations of PO_4^{3-} (0.46-1.34 mg/L) than accepted guidelines for aquatic life. The average NO_3^- concentrations in most samples (ranging from 4.25 to 7.53 mg/L) were below the acceptable limit of 10 mg/L. However, only one in Wilgamuwa had an exceptionally high average NO_3^- concentration of 17.62 mg/L. The average chlorophyll-a concentrations in Wilgamuwa (0.012-0.023 mg/L) and Hasalaka (0.007-0.023 mg/L) suggested a mesotrophic state. The results suggested that elevated NO_3^- and PO_4^{3-} levels may be due to the use of inorganic fertilizers in rice fields in the reservoir's catchment areas, which poses a direct threat to reservoir eutrophication and aquatic life. Additionally, these reservoirs, which serve as potential sources of recharge for wells in the area, may have negative impacts on certain health issues in the community. Future research efforts should be carefully planned to elucidate the combined effects of geochemical components in reservoir water as algal toxin can pose severe health impacts. This can be achieved through continuous monitoring of reservoirs and strategically selected wells in the vicinity.

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