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Spatial Variation of Irrigation Water Quality Parameters Along the New *Jaya Ganga* Trance-Basin Canal from *Kala Wewa* to *Thisa Wewa*

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Background: New *Jaya Ganga* trance-basin canal is one of the major irrigation and drinking water supply canals in north central province of Sri Lanka.

Objective: A study was conducted to assess spatial variability of water quality parameters along the canal from *Kala wewa* to *Thisa wewa* in ten sampling points to represent different land uses.

Methods: Water sampling was done in two-week intervals for three-month period from June to September in 2023. Water quality parameters such as pH, EC, TDS, NO₃⁻ N, P, K, SAR, turbidity and hazardous elements (Cd and As) concentrations were measured. Statistical analysis was performed using ANOVA to assess significant difference of specified water quality parameters among sampling points.

Results: According to the results pH of the water samples were found to vary from 7.3 to 7.8 indicating slightly alkaline in nature. Observed EC values varied from 0.16 to 0.27 dSm⁻¹, and total dissolved solids fluctuated between 78 to 136 mgL⁻¹ suggesting a low risk of salinity development in irrigated lands. The SAR at all sampling points was less than 10, indicating low sodium content, while the turbidity was below 100 NTU, reflecting low sediment content in the canal water. Nitrate N content ranged between 2.0 and 5.4 mgL⁻¹ and dissolved P content was within the range of 0.02 – 4.7 mgL⁻¹ across the sampling points. Significantly higher (p<0.05) concentrations of nitrate and phosphate contents were reported at sampling points 2 and 3 where main land use was paddy farming. Concentrations of Cd (0.003- 0.007 mgL⁻¹) and As (0.01-0.04 mgL⁻¹) were detected in all sampling points with significantly higher (p<0.05) concentrations observed at sampling points 4 and 5, which were located near the phosphate deposit at *Eppawala*.

Conclusion: Even though all tested parameters were within the FAO irrigation water limits, close monitoring is necessary to assess long-term impacts on irrigable lands.

Keywords: Heavy metals, Nitrate leaching, Salinity development