

IMPACT OF DRY AND WET CONDITIONS ON IRRIGATION WATER QUALITY OF *BASAWAKKULAMA WEWA*, *NUWARA WEWA* AND *TISSA WEWA* IN ANURADHAPURA

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Basawakkulama wewa, *Nuwara wewa*, and *Tissa wewa* are major drinking and irrigation water supplying reservoirs in Anuradhapura, Sri Lanka. Frequent assessment of water quality is important for the sustainable management of drinking and irrigation water resources. This study was conducted to evaluate the impact of the prolonged drought condition and subsequent wet condition on temporal variation of irrigation water quality in *Basawakkulama wewa*, *Nuwara wewa*, and *Tissa wewa* in Anuradhapura. Water samples were collected from each and every reservoir at different five locations using different water uses (virgin point, disturbed point, irrigation outlet) from September to December 2023 including dry and wet seasons, respectively. Each water sample was analysed for pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Nitrate-Nitrogen (NO_3^- -N), Ammonium-Nitrogen (NH_4^+ -N), Dissolved Reactive Phosphorus (DRP), Alkalinity, total sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), Sodium Adsorption Ratio (SAR), Sodium Percentage ($\text{Na}\%$), and heavy metals (Cd^{2+} , Pb^{2+} , As^+) using standard analytical procedures. Data were analysed with ANOVA using paired *t*-test. All analysed water quality parameters showed significant differences ($p < 0.05$) between two seasons during the sampling periods. By consenting to the results, the pH, TDS, DRP, NH_4^+ -N, NO_3^- -N, alkalinity, total Ca^{2+} , K^+ and Mg^{2+} of the studied reservoirs had significantly greater values ($p < 0.05$) in the dry condition compared to the wet condition. Total sodium, SAR, and $\text{Na}\%$ of the studied reservoirs had significantly greater values ($p < 0.05$) in wet conditions compared to the drought condition. Hence, the irrigation water quality of the selected reservoirs has changed according to the rainfall pattern in the dry zone of Sri Lanka. However, further studies are required to conclude the influences of land uses on the irrigation water quality of the selected reservoirs. All the measured water quality parameter values were below the maximum permissible levels during both dry and wet periods.

Key words: Drought and wet conditions, Irrigation water quality, Spatial and temporal variation, Water quality guidelines, Water quality parameters