

GROUNDWATER QUALITY FOR IRRIGATION IN RANPATHWILA CASCADE IN ANURADHAPURA DISTRICT OF SRI LANKA

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The Tank Cascade Systems (TCSs), located in dry and intermediate zones of Sri Lanka, are recognized as a globally important agricultural heritage System by the Food and Agriculture Organization. In dry zone where rainfall is scarce, TCSs play a crucial role in fulfilling the irrigation water need. The utilization of groundwater in TCSs for agricultural purposes leads to increased groundwater salinity and limits the selection of crops for cultivation. It is, therefore, important to determine the groundwater quality in TCSs. With that objective, twenty agro-wells were randomly selected from *Ranpathwila* TCS by dividing the area into a 1 km² grid and selecting one agro-well per cell. Samples were collected for five consecutive months in monthly intervals starting from September 2023. Electrical conductivity (EC), pH, salinity and total dissolved solids (TDS) were measured *in situ*. Phosphorus, nitrate nitrogen, ammonium nitrogen, magnesium, sodium, potassium and calcium concentrations were determined by standard methods at the Soil and Water Sciences Laboratory, Faculty of Agriculture, Rajarata University of Sri Lanka. Moreover, sodium adsorption ratio (SAR), sodium percentage, total hardness (TH) and Kelly's ratio (KR) were estimated. With the rainfall, almost all the parameters were changed from slight to moderate restriction to no restriction for irrigation. During the study period, SAR varied between 0.136 to 12.16; MAR between 12.73 to 98.06; KR between 0.059 to 11.76; and TH between 10.99 to 445.93 mg L⁻¹. Therefore, the average water quality tested during the six-month time period of the cascade falls within the irrigation water quality standards.

Keywords: KR, MAR, SAR, Tank cascade system