

EVALUATION OF GROUNDWATER QUALITY AND SUITABILITY IN LOWER WALAWE BASIN FOR DRINKING AND IRRIGATION

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The Walawe River basin is the fourth largest river basin in Sri Lanka, where rapid industrial and agricultural development is undergoing. Hence in this area, groundwater, which is the most important source of freshwater for consumption, has become very vulnerable due to irrigation influences. A detailed hydrogeochemical study was carried out in the lower region of Walawe River basin in order to assess its suitability for drinking and irrigation purposes. Thirty-two groundwater samples were collected during the dry season and analysed for their major and trace elements. The solute compositions were dominated by HCO_3^- (mean = $380 \pm 30 \text{ mg L}^{-1}$), Cl^- (mean = $129 \pm 50 \text{ mg L}^{-1}$), and SO_4^{2-} (mean = $89 \pm 27 \text{ mg L}^{-1}$), which were balanced by Na^+ (mean = $79 \pm 15 \text{ mg L}^{-1}$), Ca^{2+} (mean = $63 \pm 13 \text{ mg L}^{-1}$), and Mg^{2+} (mean = $44 \pm 10 \text{ mg L}^{-1}$). The Piper classification indicated that the groundwater in the region was dominated by $\text{Ca}^{2+}\text{-HCO}_3^-$ type of water. The calculated water quality index rating showed that out of the 32 samples, only 53% of the samples were suitable for drinking purposes during the dry period. According to the US salinity laboratory and Wilcox's classification, two-thirds of investigated groundwater samples were suitable for irrigation purposes. The findings of this study suggest that water quality management in lower region of the basin is critical for the future sustainability of the water resource.

Keywords: Agricultural pollution, Irrigation suitability, Water quality index