

# ASSESSING WATER QUALITY USING A COMPOSITE INDEX: A STUDY IN KOTAGALA WETLAND, NUWARA ELIYA, SRI LANKA

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**Abstract:** The Kotagala wetland plays a vital role in provisional, regulating, cultural and supporting ecosystem services. Since the water in this wetland is used for a variety of human functions, a periodic chemical and physical quality assessment of its water appears to be required. This study used a Water Quality Index (WQI) to assess the level of water quality since it was designed to integrate multiple criteria and their dimensions into a single score. Water samples were collected from six selected inlets and one outlet in the wetland for a duration of ten months from November 2021 to August 2022 with monthly intervals. The following seven parameters were measured and used to generate WQI: Nitrate, Phosphate, Total Sus-pended Solids, Total Dissolved Solids, pH, Electrical Conductivity, and Salinity. According to the calculated WQI for separate locations, two locations fell under “Poor” water quality status, and all other locations were counted under “Good” water quality. However, the study revealed that the sampling location's proximity to urban areas indicated “Poor” water quality. According to the calculated monthly WQI, the values ranged from 45.8 in February to 113.3 in December. The minimum value of WQI appeared in the driest month. It shows the minimum water pollution experienced in the driest month. A significant relationship was identified between the WQI and rainfall ( $P=0.002$ ). The wetland's mean WQI was calculated to be 75.5, which is considered as a “good” quality water. While certain inlets exhibited "Poor" water quality, the overarching water quality of the entire wetland was consistently classified as "Good," highlighting its effective role in regulating water quality. The results demonstrated the wetland's capacity to regulate water quality.

**Keywords:** Ecosystem services; Water quality index; Wetlands