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**Assessment of Chemical Retention of Riparian Area (Thaulla) in a Small Tank: A Study in Kankanam Tank, Weeraketiya, Sri Lanka**

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**Abstract**

The agriculture sector in Sri Lanka utilizes a considerable amount of land cover (27,400 km<sup>2</sup>), allowing a significant contribution to the national economy. Most of these agricultural fields are cultivated via irrigation schemes, especially in the Dry Zone of Sri Lanka, which receives limited rainfall throughout the year. In ancient days, communities in these areas used their techniques to develop tanks as a strategy to store and conserve the rainwater. The riparian area or “Thaulla” located in the upper peripheral region of the tank, is one of the basic and vital components that help filter nutrient pollutants and sediments in the water inflow of the tank. This study aimed to assess the chemical retention of Thaulla in a small tank viz. Kankanam tank, located in Hambantota District in Sri Lanka. The extent in the Thaulla area of the selected tank is about 2,185.3 m<sup>2</sup>. Surface soil (0-30 cm) samples from eleven locations within the Thaulla area and water samples from three tank locations were collected randomly. As the control, typical soil samples near the sampling site were collected. These samples were tested using standard methods for nine parameters: pH, EC, NO<sub>3</sub><sup>-</sup>-N, NH<sub>4</sub><sup>+</sup>-N, Total N, P, Na, K, and Ca. ArcMap Software prepared a spatial distribution map for each parameter to identify their spatial variations in the studied area. Results revealed that concentrations of nutrients in Thaulla area were high compared to the typical soil and water in the tank indicating that it was highly contributed to retaining chemicals such as P (29.88 ppm), Ca (447.55 ppm), Na (5.14 ppm), and K (4.17 ppm). According to the spatial variation, it was noted that various external sources around the tank influenced the nutrient retention in the Thaulla area. The nutrient retention was high in the areas, closer to the landfills, paddy fields, and leachate canals. Further, the functionality of the Thaulla area as a constructed wetland could be identified. The tank water quality was satisfied with the tested parameters and in accordance with the irrigation water quality guidelines. Therefore, the Thaulla/riparian area is an important component of a tank allowing substantial chemical retention to control the pollution of water in the tank. Further studies need to be conducted to understand the seasonal variation of the chemical retention in Thaulla area.

**Keywords:** Constructed wetland, Riparian area, Small tank, Soil parameters, Water quality parameters