

SOIL QUALITY IN *THAULLA* AREA AND WATER QUALITY STATUS DURING LOW FLOOD LEVELS OF *ULANKULAMA* TANK IN ANURADHAPURA, SRI LANKA

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Thaulla is the upper peripheral region of small tanks in the Dry Zone of Sri Lanka. It plays a significant role in filtering inflow water and absorbing pollutants which could otherwise deteriorate the tank water quality. This study investigated the chemical precipitation function of the *thaulla* area in the *Ulankulama* tank by testing the variation of 13 soil parameters and 15 tank water quality parameters, i.e. pH, EC, TDS, NO_3^- , NH_4^+ , total N, available P, total K, Na, Ca, Mg, Fe, Al, As, Cd, and Pb. Soil samples were collected from 19 randomly selected points in the *thaulla* area from two depths (0-15 and 15-30 cm). Water samples were collected three times from *gilma* area (central part) of the tank during low flood levels. All soil and water samples were tested for the above parameters using standard methods and point soil sample values were interpolated to the *thaulla* area using Kriging method in Arc GIS 10.2. The results indicated that the *thaulla* area of the *Ulankulama* tank acts approximately as a wetland and it is evident by high accumulation of Fe (1819.65 ppm) and Al (1586.75 ppm) with a considerable retention of P (74.80 ppm), Ca (163.79 ppm) and Mg (203.67 ppm) in soil. The chemical precipitation function of *thaulla* was further corroborated by observing considerable higher concentrations of P, Fe, and Al than those of the reference values of the soils (Reddish Brown Earth) in the area. Moreover, this function was confirmed by the very low concentrations of Fe (1.40 ppm), Al (0.009 ppm) and P (0.095 ppm) in tank water during dry spell. N was the limited nutrient in the *thaulla* area (0.073%) and it is identical to the wetlands. EC, N, P, Na, Ca, and Mg concentrations decreased towards the water spread area. In contrast, K and Pb concentrations followed the opposite. This study shows clear evidence for the chemical precipitation function of *thaulla* and suggests to restore *thaulla* area of all tanks of the Dry Zone to sustainable usage of tank water for drinking and irrigation.

Keywords: Chemical precipitation, *Thaulla*, *Ulankulama* tank, Wetland