

## SPATIAL VARIATION OF GEOCHEMICAL PARAMETERS DUE TO RECENT EXCAVATIONS OF LAKES IN COLOMBO SUBURBS WITH SPECIAL REFERENCE TO THALAWATUGODA AREA

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The urban development projects are currently established in and around Sri Jayawardenapura Municipal Council area tend to change the landscape with the excavation of the mud in the bottom of irrigation systems and small lakes. Increasing the depth of canals and tanks will result in change the elevation of such areas below mean sea level (MSL). If the bottom lies below the sea level, it may promote salt water intrusion. Mixing saline water to fresh water will cause geochemical and ecological imbalance of the area. This paper describes the spatial variation on geochemical parameters across the zone of Wellawatta-Nugegoda–Thalawatugoda and its suburbs and reviews the causes and management of saltwater intrusion due to recent excavations of the Thalawatugoda tank.

A total of one hundred and fourteen (114) groundwater samples were collected from three parallel traverses of 500 m distance of the study area during the dry period of July to September 2015 from residential, commercial, and municipal wells. Sampling from vertical profiles was also done in some locations where large water bodies are located. Temperature, pH, Electrical Conductivity (EC), Salinity and Total Dissolved Solids (TDS) were measured as in-situ parameters, whereas Chloride (Cl<sup>-</sup>), Nitrate (NO<sub>3</sub><sup>-</sup>) and Sulphate (SO<sub>4</sub><sup>2-</sup>) were analysed at the chemical laboratory of the Geological Survey & Mines Bureau. The fish species in water tanks were obtained from the Biological Park, Thalawatugoda and illegal fishermen around both Thalawatugoda and Diyawannawa tanks. Fish were collected up to deep profiles (up to 2 m) of the water bodies and categorized into freshwater, marine or brackish water species, according to the standard fish guide/book of Freshwater Fishes of Sri Lanka, in order to observe whether the specific brackish water fish species are available or not. Salinity, chloride and electrical conductivity of the samples across three traverses-lines show the similar pattern of chemical variation. Salinity values are as high as the range of 237 -572 ppm at the coastal areas, then values decreases towards the land areas. However, abnormally high salinity values of 300 -550 ppm were observed at the water bodies near Madiwela, which is located nearly 6 km away from the coastal line. The same area recorded the highest concentrations of chloride, sulphate, and electrical conductivity than surrounding land area. Fish species which have the ability to tolerate salinity, such as *Channa striata*, *Aplocheilichthys parvus*, *Aplocheilichthys dayi*, and *Ambassis ambassis* were also recorded from the bottom layer of the tank at the Madiwela.

The spatial variation of the some chemical variables as well as brackish water fishes in the fresh water tanks suggested that the salt water intrusions were experienced in the Thalawatugoda town in the recent past, which could be mainly due to the recent excavations of Tawatugoda tank and related irrigation systems, now being located below the MSL. Obtaining such data from pilot surveys are important as baseline data for Environmental Impact Assessment (EIA) reports of the development projects.