

Groundwater quality assessment and distribution in Kolonnawa agriculture dominate area- Sri Lanka

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Abstract

A research study was conducted in the Kolonnawa agriculture dominate area, Colombo district in the Western Province of Sri Lanka. Study area was located in the right bank of the Kelani river basin. Objectives were to assess the groundwater quality changes in the agriculture dominate field with precipitation, present groundwater levels fluctuations and groundwater consumption of the region. Continuous monitoring was conducted in 35 dug wells with respect to groundwater levels, electrical conductivity (EC), total dissolved solids (TDS). Fifteen wells were selected for total chemical analysis. The study helped to prepare the groundwater distribution map using the GIS package. Groundwater recharge and discharge areas were identified based on the prepared groundwater distribution maps. Groundwater EC values of the groundwater in the recharge area was below 250 micro siemens per cm ($\mu\text{s/cm}$). The mean EC in the fields situated away from the agriculture field was recorded as 215 $\mu\text{s/cm}$. Some quantity of saline river water intruded through channel and EC values increased. The EC values in the groundwater near by the channel was recorded as 1880 $\mu\text{s/cm}$ and with precipitation EC values was decreased down to 500 $\mu\text{s/cm}$. Nitrate levels had a significant difference in cultivated and non cultivated areas. The results revealed that the nitrate level in groundwater has increased to certain level but not exceed 20 mg/l (50 mg/l WHO standard).

Keywords: Groundwater, Salinity, Nitric Level, GIS