

Abstract FM 07

PHYSICOCHEMICAL AND MICROBIOLOGICAL CHARACTERISTICS OF GROUND AND SURFACE WATER IN PUTTALAM AREA, SRI LANKA

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Water is the most vital natural resource for life and plays a significant role in drinking, industry, agriculture and domestic sectors. In most parts of Sri Lanka, about 60% of the population extracts groundwater for drinking from shallow dug wells. Catchment characteristics, anthropological activities and land use practices are the major factors that affect the quality of ground- and surface water. Therefore, the present study was carried out to identify the microbiological and chemical contamination status of 37 sources (24 groundwater and 13 surface water) in Puttalam District during May 2018. The study was focused to determine total coliform and fecal coliform contamination along with some physicochemical parameters of ground and surface water. Sampling, transportation and analysis were performed following standard protocols. Results of the study revealed that all sampling locations were contaminated with both total and fecal coliform bacteria, and the values exceeded the WHO and SLS standards for drinking water. The range of pH values in groundwater (5.90 - 9.54) and surface water (6.90 - 8.70) showed greater variation, and the lowest was recorded from Lunuwila groundwater sampling location (5.90). Samples of 42% groundwater locations were not within the WHO and SLS standards for conductivity ($> 750 \mu\text{S cm}^{-1}$), and the highest value was recorded from Mundalama groundwater location ($9,210 \mu\text{S cm}^{-1}$). Ammonia, nitrate and nitrite concentrations in groundwater of the study area ranged from < 1.00 to $16.11 \mu\text{g L}^{-1}$, 0.14 to 14.76 mg L^{-1} and from < 1.00 to $11.64 \mu\text{g L}^{-1}$, respectively. PCA analysis revealed that sampling locations were grouped into groundwater and surface water according to the water quality recorded during the study period.

Keywords: Ground and surface water, Puttalam area, water quality

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