Hydrochemical analysis and evaluation of groundwater quality in Rathupaswala area in Sri Lanka

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Water quality analysis is one of the most important aspects in groundwater studies. The physiochemical parameters of groundwater and soil play a significant role in classifying and assessing water quality. The groundwater quality is a function of natural processes as well as anthropogenic activities.

The objective of the present work is to ascertain the major ion chemistry of groundwater and soil in Rathupaswala area in Sri Lanka. Water and soil samples were collected from 12 drinking water wells between 7º 02' 25" to 7º 04' 06" North latitude and 80º 00' 043" to 80º 2' 08" East longitude in Rathupaswala area. Each drinking water well was subjected to four times analysis within four months for pH, specific conductance, COD, hardness, and metal ions including Al, Fe, Ca, Mg and Na. The observed physicochemical parameters of ground water were compared with World Health Organization Standards (WHO). According to the experimental results, all the ground water samples appeared colorless, clear and odorless. The observed pH values of all the water samples were ranged from 4.8 to 6.5. Aluminium content in the water samples was not in the detectable limits and the maximum iron content observed was 0.14 mg L^{-1}. Total magnesium and calcium contents were ranged from 4.9 to 29.3 as $CaCO_3$ mgL^{-1}. The majority water type in the study area was found to be Na-bicarbonate water type. Groundwater soil samples were analyzed for pH, specific conductance, cation exchange capacity organic matters, mineral phases, and metal irons including Al, Fe, Ca, Mg and Na.

Groundwater samples in studied area do not exceed the WHO standards for drinking water parameters except pH value. The recommended pH value was also achieved by boiling process of the ground water. Experimental data revealed that the pH range of groundwater and soil does not greatly influence on the Al, Fe, Ca, Mg and Na content in drinking water in this area.

Key words: groundwater, water quality parameters, soil analysis, pH value, Rathupaswala area