MSc Degree in Environmental Science

IMPACT OF CHEMICAL FERTILIZERS USED IN TEA INDUSTRY ON GROUNDWATER QUALITY: A CASESTUDY FROM SRI LANKA

A dissertation submitted

by

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ABSTRACT

The basis of this research was a long-held belief among the villagers that the groundwater in the Morawaka area was unsuitable for drinking. The research was conducted in two Grama Niladari divisions called Morawaka and Paragala in Kotapola divisional secretariat, Matara District. Groundwater in 33 wells and 02 pipe wells were tested for parameters such as pH, Electric Conductivity, Salinity, Biological Oxygen Demand, Chemical Oxygen Demand, Total Dissolved Solids, Calcium Hardness, Total Hardness, Nitrate ions and fluoride ions. Apart from few deviations of some tested samples such as low pH value (4.88) in sample 03, High Total Dissolved Solid value in sample 01, 8 and sampling area 2 of sample site 05, high Electric Conductivity value in sampling area 2 of sample site 05, high Biological oxygen demand in sample no. 13, 14, 15, 20,22,24,26, 27, 28 and 31, and high total hardness and Ca hardness in sample no. 09, other samples were within the suitable range for drinking.

However, according to the facts revealed by questionnaires carried out, people of the area are facing several problems while drinking groundwater such as unpleasant taste and odor. The possible causes for changes in water quality such as chemical fertilizer contamination, household water added to water sources and surface runoffs mixed to uncovered wells and the solutions for them such as increasing awareness about the effects of fertilizer to groundwater quality among farmers, purifying drinking water and taking measures to prevent soil erosion were suggested by residents through a questionnaire.

Based on the results of the above parameters, the water samples that were tested can consume drinking water. However, there are many other water quality parameters that should be tested for the above samples and therefore, further research is needed to reach a definitive conclusion.