

Study of physiochemical and microbial water quality parameters of domestic wells in Panadura

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Ground water is a valuable resource and is a vital source of drinking water. Due to population and developmental pressures ground water is vulnerable to contamination in different ways. Since ground water is still consumed by the people in many cities and suburbs, it is of vital importance to ensure the water is of good quality. The objective of this study was to investigate the physiochemical and microbial quality of well water in selected domestic wells in Panadura area, a populated city in the Colombo district.

Thirty wells were selected randomly to determine the physicochemical parameters (i.e. temperature, pH, electrical conductivity, nitrates, phosphates, chemical oxygen demand, chlorides and iron) and microbial water quality parameters (i.e. Coliforms and *E. coli*) during wet and dry season in 2009 and 2010. In addition, investigations were carried out to study whether there is a correlation between ground water quality and structure and locations of the wells. The parameters were then compared with Sri Lanka standards for drinking water.

This study revealed that water from most of the wells were unsuitable for drinking mainly due to poor microbial quality. The results revealed that the levels of Coliform bacteria were of a wide range (2912.93 in the wet season and 1481.63 in the dry season). Similarly, COD values too showed a variation of 42.21 mg/l and 16.79 mg/l in wet and dry seasons respectively. In all wells, pH was less than 5.5, which is below the standard value. Only 13% of wells were within the microbiological limits specified in SLS 614 part II standard. Nitrate, Phosphate, Chloride and Iron levels were within the recommended levels given in SLS standard. It was evident that there is a linear positive correlation between conductivity vs. pH, conductivity vs. COD, conductivity vs. nitrates, conductivity vs. phosphates, conductivity vs. chlorides, phosphate vs. COD and *E. coli* vs. pH. Negative correlations were found between: pH vs. distance to the toilet pit, Coliform vs. distance to the toilet pit, Coliform vs. whether the well is covered or not and depth vs. temperature. According to the paired sample t -test there is a statistically significant difference between the mean values of temperature, pH, nitrates, COD, iron, Coliform and *E.coli* during wet and dry seasons.