



**Study of Physiochemical &
Microbial water quality parameters
of selected domestic wells in
Panadura area**

By

B.C.J. Fernando

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Abstract

Ground water is a valuable resource and is a vital source of drinking water. Unfortunately many people view ground water as a limitless resource protected from human activity. Ground water is vulnerable to contamination and in order to preserve its quality must be protected. Since ground water is consumed by people using wells, the quality of such water is extremely important to human health.

The objective of this study is to investigate the physiochemical and microbial quality of well water in selected wells in Panadura area. Thirty wells were selected randomly from Panadura area to determine the physicochemical parameters (i.e. temperature, pH, electrical conductivity, nitrates, phosphates, chemical oxygen demand, chlorides & iron) and microbial water quality parameters (i.e. Coliforms and *E. coli*) in domestic wells during wet and dry season and to investigate whether there is a correlation between ground water quality and structure of the wells and locations of wells. Sampling was carried out during a four months period from August to September 2009 representing wet season and January to February 2010 representing dry season. The parameters were then compared with Sri Lanka standards.

This study revealed that most of the well water in Panadura area were unsuitable for drinking due to higher levels of Coliform bacteria (Greater than 10 per 100ml) and COD (Greater than 10mg/l) values and lower levels of pH (Less than 6.5). Only 13% of wells were within the microbiological limits specified in SLS 614 part II standard. Nitrate, Phosphate, Chloride and Iron levels in Panadura area were within the recommended levels given in SLS standard. Suitable suggestions were made to improve the quality of well water in Panadura area.

It was evident that there were linear positive correlations 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.