

EFFECT OF APPLICATION OF EXCESS FERTILIZER ON THE QUALITY OF GROUNDWATER IN THE EPPAWALA AREA

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Since ancient times, Sri Lanka has traditionally been an agricultural country. After the introduction of chemical fertilizers and other agro chemicals to produce high yielding crops, environmental friendly agricultural practices had been diminished and a number of pollution issues have appeared. The main pollutants in such areas are surplus nutrients that are readily available in soil. When they are found in excess in water, it is detrimental to human health, fauna and flora and cause many environmental problems.

Eppawala area in the North Central part of Sri Lanka is used for heavily for agricultural practices. Present work was carried out to study the accumulation of nutrients in the groundwater and an attempt is made to categorize the groundwater quality of North Central Dry Zone. Wells are located within agricultural fields, comprising the domestic, dug wells and tube wells were selected for the study. Water quality of wells was monitored for a period of three months.

Nitrate and phosphate levels of collected water samples were measured using the HACH 2100 spectrophotometer using the powder pillow method. Major cations were measured using the Perkin Elmer atomic absorption spectrophotometer at the Department of Geology, University of Peradeniya.

The shallow and deep ground waters possess generally low nitrate and phosphate concentrations even though large quantities of fertilizer had been applied to the agricultural fields. The nitrate values are in the range of 0.2 - 6.4 ppm and phosphate values fall between 0.04 ppm and 1.56 ppm. The dissolved cations samples are also considerably low in most locations. The pH values of water are in the range of 4.88 to 8.82.

The study revealed that the nutrient concentrations fluctuate according to the fertilizer applications. The low values of nitrates and cations of well water may be due to the reducing conditions developed by shallow groundwater table and the overlying clay soil layer. Such conditions facilitate to convert nitrate into NH_4^+ or N_2 gases which can easily be removed from the system. The negative correlations of cations with phosphate show that they may have precipitated into insoluble forms at favourable pH conditions. Further, the montmorillonite clay minerals in the area can scavenge phosphates.

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