

**B-01 : IMPACT OF AGRICULTURE ON GROUNDWATER QUALITY:
KALPITIYA PENINSULA PART 1: TRENDS IN GROUNDWATER
QUALITY WITH TIME AND LAND-USE**

*A M Mubarak, H P G Gunawardhana, D J Abeyratne,
D S P Kuruppuarachchi*, W A R N Fernando*, A R Lawrence**
Ceylon Inst. of Scientific & Indust. Res., Colombo,
*Dept. of Agriculture, Peradeniya, **British Geological Survey, UK.*

Agriculture in Sri Lanka is being intensified as evidenced by the increasing trend shown in the consumption of agrochemicals. However in many areas intensive crop production occurs on soil directly overlying shallow aquifers used for both potable water supply and irrigation. Rural water supplies are rarely monitored for agrochemicals although intensive agriculture can have a significant impact on groundwater quality.

Kalpitiya Peninsula was selected for this study as hydrogeological conditions together with intensive horticulture have made this area highly vulnerable. Twenty five dugwells within 3 broad land-used categories were sampled and analysed for chloride and nitrate concentrations over a period of 4 years to gain an overall appreciation of groundwater quality. Analysis for chloride and nitrate were carried out initially with ion specific electrodes but later Ion Liquid chromatograph was used as the electrode method gave erroneous results for nitrogen.

Results indicate that there is a clear correlation of groundwater quality with land-use. Groundwater within the intensively cultivated area typically had nitrate and chloride concentrations in the ranges of 10-50 mgN/l and 100-300 mg/l respectively, compared to 0.2 mgN/l and 50-100 mg/l within the non-cultivated area.

Clear trends in the water quality of the dugwells with time are difficult to confirm over the relatively short period of monitoring. A possible rising trend in chloride concentrations was observed although no corresponding increase in nitrate was apparent. Both varied considerably over short periods in most of the wells producing a very 'peaky response' with time. Most likely explanation is that nitrate and chloride are washed down rapidly from the soil to the water table during period of excess rainfall/irrigation and this plume of nitrate and chloride rich water migrates to the dugwells as a pulse with little dispersion in the sand aquifer.

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