

**B-02 : IMPACT OF AGRICULTURE ON GROUNDWATER QUALITY:
KALPITIYA PENINSULA PART II: LEACHING PATTERN OF
AGROCHEMICAL SOLUTES**

*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.*

A research program was undertaken to assess the impact of agriculture on groundwater quality in the Kalpitiya Peninsula (see Part I)/. In order to estimate the fluxes to groundwater, a clear understanding on the processes controlling the leaching of various agrochemical solutes is important.

An experimental field plot at the Kalpitiya Research Station was cultivated with onion. Nitrogen (as N) and potassium (as K₂O) were applied in five applications at a rate of 250 kg and 200 kg/ha respectively. The irrigation water was pumped from a nearby open dugwell by a hand held hose. Lysimeters were installed at the field plot to determine the quality and quantity of water draining through the unsaturated zone during cultivation. Piezometers of different depths were used to monitor ground water quality beneath the experimental plot. Analyses 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.

The solute concentrations of the Maha lysimeter drainage were usually less than that in Yala. This can be attributed to the heavier rainfall generally experienced during the Maha season. Good chloride mass balance was obtained but the nitrogen data was more complicated. About 20-30% of the nitrogen applied is being leached to the groundwater which can be attributed to the highly permeable nature of the soil and heavy irrigation. Volatile nitrogen losses appear to be insignificant.

A considerable seasonal variation was noted with nitrate and chloride concentration and the electrical conductivity of the groundwater. This seasonal fluctuations make predictions of long term groundwater quality trends from such short period of monitoring impossible. No significant difference in water quality between the shallow and deep piezometers were obvious confirming that there is good mixing vertically.

This research was funded by the Overseas Development Administration (ODA), UK.