



**A study on the agricultural runoff and other improper
waste disposal degrading the quality of stagnant water
bodies in South Eastern region of Sri Lanka**

A thesis submitted to the Faculty of Science University of Colombo
For the partial fulfilment of the Degree of M.Sc. in Analytical
Chemistry

UCFS



559810

By
MAC Mohamed Haniffa
December 2011

ABSTRACT

Agricultural runoff is a leading source to degrade the quality of stagnant water bodies through its substance. The direct discharge of these runoff and other improper waste disposal to the stagnant water bodies and to paddy field significantly degrade the quality of water and soil. The objective of this research is to investigate the level of degradation in stagnant water bodies due to agricultural runoff and other improper waste disposal practices. Physical, chemical and biological parameters were monitored over a period of six months and the correlations were sought among them. Three of different stagnant water bodies were subjected to the investigation.

Each of these stagnant water bodies are highly contaminate having different type of chemical fertilizer, pesticides, sedimentation, nutrients, and animal feed. Not only agricultural waste but also other improper waste disposals including municipal waste, industrial waste, hospital and domestic effluent have contributed to the degradation of the water quality and their impacts were monitored.

Any considerable deviation in chemical characteristic of the location C with respect to other locations and its related paddy cultivated soil samples were further investigated to identify the leaching rate of agricultural runoff containing chemical compounds.

Analytical data and three way ANOVA and correlation investigations revealed that the stagnant water body at Sammanthurai was contaminated with significant amount agricultural runoff with LSD (least significant difference), hospital and domestic effluent. The Ninthavure stagnant water body was contaminated with high levels of salt and it had a significantly effect on the dissolved oxygen levels, salinity levels and total coliform levels with LSD ($P < 0.05$). Stagnant water body at Kalmunai was found to be degraded by all type of contaminants mentioned above.

From the correlation investigation, significant positive R^2 values were found among physical and chemical parameters, biological parameters and finally physical and biological parameters. Similarly nutrient and salt concentration correlate with dissolved oxygen. The salt concentration not only correlates with dissolved oxygen but also it will significantly correlate with biological parameters.