

## STREAM WATER QUALITY DEPLETION UNDER INTENSIVE AGRICULTURE

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### Abstract

*Intensive vegetable farming is becoming popular in central highlands of Sri Lanka where most of the nation's rivers originate. Many studies have revealed that stream water quality is affected by various anthropogenic factors including intensive farming. This study presents the impact of intensive farming on stream water pollution in Krundu Oya catchment, a sub watershed of Upper Mahaweli Catchment Area of Sri Lanka.*

*Five sampling points were established along a tributary of Kurundu Oya catchment to measure nutrient and sediment discharge. A pre-tested questionnaire was administered to gather information on socio-economic aspects of stream water pollution.*

*Suspended sediments,  $\text{NO}_3\text{-N}$ , and  $\text{PO}_4\text{-P}$  in stream water showed a significant relationship with different land uses. The forest land use exhibited the lowest threat to stream water quality while contribution of intensive vegetable farming was the highest. The  $\text{NO}_3\text{-N}$  content in vegetable farming location of the stream exceeded the WHO standard of 10mg/l while indicating possible health risks as people use this water for domestic purposes. The results of the household survey showed that majority of farmers have certain knowledge on water pollution but the awareness on nutrient pollution is highly limited.*

*Key words: Mahaweli Catchment, sediment discharge, nitrate pollution, intensive farming, suspended and dissolved concentrations*

### 1. Introduction

Agriculture is one of the leading sources contributing to water pollution (Andreoli, 1993; Convey and Pretty, 1988). Agricultural fields contribute a considerable proportion of Nitrogen(N) to streams and other water bodies in major agricultural areas. Therefore, increasing nitrogen inputs in agriculture have caused great concern for the health of riverine ecosystems (Pimentel, 1993; Hill 1996 and Zhao et al., 2009). In general, one third of the nitrogenous fertilizers incorporated to farm lands are exported to surface waters (Howarth et al., 2002). Nitrogen export is generally greater in rivers which drain intensively cultivated catchments (Jordan and Weller, 1996). Nitrate pollution continues to be a continental problem causing deterioration both fresh and marine waters.

Phosphate P ( $\text{PO}_4\text{-P}$ ) is another pollutant, which causes water quality deterioration in numerous ways. An excess of phosphate entering the waterways can induce the process of eutrophication. Non-point sources like farmlands are responsible to a great extent in loading phosphate in water bodies. Usually