WATER QUALITY VARIATION IN A TANK CASCADE IRRIGATION SYSTEM: A CASE STUDY FROM MALAGANE TANK

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The dry zone agriculture in Sri Lanka was thrived by the ancient hydraulic system known as Tank Cascade Irrigation System (TCIS). It is a network of interconnected tanks and canals within a small watershed, which enhances irrigation water supply to farmlands. The eutrophication of these tanks have not been observed, even though a significant amount of excess nutrients enter into tanks from the agricultural fields, buffalo wallows and buffalo resting grounds (Pillawa). We hypothesized that the upper periphery (Thawalla) of a tank may act as a constructed wetland which could remove these nutrients. The main objective of this study is to identify water quality variation in an end member tank of a selected cascade.

The Malagane tank, located in the Deduru Oya basin was selected for this study. Tank and seepage water samples at prescribed locations were collected on regular basis. Chemical parameters such as pH, electrical conductivity, alkalinity, hardness, nitrate-nitrogen ratio and nitrite-nitrogen ratio, and concentrations of sulphate, sulphide, phosphate, chloride, sodium, potassium, calcium, magnesium, iron and manganese were analyzed twice a month. In this paper, water quality variation of the tank and the seepage zone is discussed. A significant variation of some water quality parameters was observed during the wet period although the concentrations of Na, K, Ca and Mg were comparable. During the dry season, the concentrations of chemical species tested increased. The monitoring program is being continued to investigate the annual trend patterns of the water quality parameters.

National Science Foundation of Sri Lanka is acknowledged for the Research Grant RG/2004/GMR/01.