

Determination of water quality and evaluation of the trophic state of Udukirivila reservoir, Weerakatiya, Sri Lanka

T.P.D.S.Bandara, H.B.Asanthi* and R.A.Maithreepala

Department of Limnology, Faculty of Fisheries and Marine Sciences & Technology,
University of Ruhuna, Matara, Sri Lanka

*asanthi@fish.ruh.ac.lk

This study was conducted to determine the basic physiochemical parameters, Water Quality Index (WQI) and Carlson's Trophic State Index (TSI) in Udukirivila reservoir, Weerakatiya, Sri Lanka. It is in a cascade system connected to Muruthawela reservoir. Catchment area consists with residences of the villagers and farm lands. Water sampling was performed four times during two months period from October 2014 to November 2014 at randomly selected seven sampling sites from the surface middle and bottom of the water column at each site. Average water depth of the sites were taken as an indicator of the inflow and observed as $1.44\pm 0.82\text{m}$, $1.32\pm 0.76\text{m}$, $1.79\pm 0.68\text{m}$ and $1.71\pm 0.67\text{m}$ during the four occasions respectively. Though bottom temperature, BOD_3 , Chlorophyll-a, TSS, pH, surface and bottom conductivity, nitrate and phosphate didn't indicate significant variation among seven sampling sites except surface temperature, surface and bottom DO. Most of the parameters showed significant variation among four sampling occasions except surface temperature, BOD_3 , bottom conductivity, surface DO and surface nitrate. The values of WQI and TSI were not significantly different among the sites. However, WQI and TSI values varied significantly among the four sampling occasions. The WQI for occasion 1 (45 ± 8) and occasion 3 (29 ± 10) explained bad water quality and occasion 2 (64 ± 6) and occasion 4 (60 ± 15) showed medium water quality. The TSI values indicated eutrophic conditions in the reservoir when considering secchi depth and total phosphorus concentration in water. The eutrophic condition is visible in the google maps of recent years as the large coverage of aquatic macrophytes (nearly 1/3 of the

surface area). The temporal variation of the water quality parameters was clearly identified in the study and it revealed that water quality of the reservoir is badly affected by the runoff from the catchment area. The water from the reservoir cannot be recommended to use as a source for drinking water treatment via conventional treatment.

Keywords: Reservoir, Trophic State Index, Water Quality Index.