

2018-09-01

Water quality in earthen dams and potential health impacts: case of Nadosoito Dam, Tanzania

Eliakimu, Naziel

IWA Publishing

<https://doi.org/10.2166/wpt.2018.083>

Provided with love from The Nelson Mandela African Institution of Science and Technology

Water quality in earthen dams and potential health impacts: case of Nadosoito Dam, Tanzania

N. Eliakimu; R. L. Machunda; K. N. Njau

DOI://doi.org/10.2166/wpt.2018.083

Abstract

The aim of the study was to assess seasonal water quality variations in an earthen dam and their potential impact on the health of those using the water for domestic purposes. High values of chemical oxygen demand, from <0.7 to 87 mg/l, and turbidity, from 204 to 53,300 NTU, were reported. Turbidity and total suspended solids were the highest at the onset of rainfall, and generally declined from the wet to the dry season. Ammonia concentrations ranged from 0.14 to 270 mg/l and nitrate from 0.6 to 1,715 mg-N/l, and were highest towards the end of wet season, while NO₂-N was highest (290 mg/l) in the dry season. There were some notably high phycocyanin (PC) pigment values (19.9 to 495 µg/l) unique to cyanobacteria, well above the WHO alert level of 30 µg/l. PC is associated with a variety of toxins affecting humans and animals. Possible sources of pollutants include animal droppings/urine and runoff from farms applying fertilisers. A further aim was to assess water treatability with a pilot inclined plate settler system for pollutants and microbial removal. The results of this study suggest that water treatment systems must be designed to take care of the worst influent water quality conditions.

Keywords: cyanobacteria, earthen dam, health impacts, water quality