Influence of Land Use Patterns on some Limnological Characteristics in the South-Eastern Part of Lake Victoria, Tanzania

By

Salome D. Shayo[a], Charles Lugomela[b] & John F. Machiwa[b]

Abstract

To investigate the influence of human activities on limnological characteristics of Lake Victoria, we analyzed inorganic nutrient concentrations, phytoplankton diversity and biomass at three locations with different land use patterns: Mwanza (urban/industrial), Magu (agricultural) and Kayenze (sparsely populated). Mwanza had significantly higher ammonia concentration compared to Kayenze and Magu. At the shoreline stations, significantly higher nitrate concentration was observed at Mwanza compared to Kayenze and Magu. Similarly, Mwanza had significantly higher concentrations of soluble reactive phosphorous in the shoreline stations compared to Magu and Kayenze, but not in the open waters stations. Shoreline stations also showed significant differences in phytoplankton diversity among sites. The shoreline station at Mwanza also showed significantly higher levels of Chl. *as* compared to those at Magu and Kayenze. However, in the open water stations Chl. *a* concentrations did not differ significantly among sites. The results suggested that urban pollution in Mwanza and agricultural activities in River Simiyu catchment strongly influence the limnology of Lake Victoria and that the nearshore waters, which are the receiving points, were highly impacted compared to the waters outside bays. Thus, proper urban waste management and sustainable land management practices are critical for reducing point and non-point sources of pollution into Lake Victoria.

Keywords

Limnology; human activities; phytoplankton; eutrophication; East African Great Lakes