ANALYSIS AND MODELLING OF SURFACE WATER QUALITY IN SOUTH-WEST IKPA RIVER BASIN, AKWA IBOM STATE

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BSc (Hons) (Calabar)
17/PG/FS/CH/011

A DISSERTATION IN THE DEPARTMENT OF CHEMISTRY
FACULTY OF SCIENCE

SUBMITTED TO

THE POSTGRADUATE SCHOOL, UNIVERSITY OF UYO, UYO
AKWA IBOM STATE, NIGERIA, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER'S OF SCIENCE (MSc) DEGREE IN ENVIRONMENTAL CHEMISTRY

JUNE 2021

ABSTRACT

Climate variability land cover/use and soil erosion risk are important contributors to surface water quality. The aim of the study was to assess the impact of rainfall variability on surface water quality of selected rivers in South-west Ikpa River Basin, Akwa Ibom state Nigeria. Thirteen physicochemical parameters (pH, temperature, DO, EC, alkalinity, BOD, TDS, TSS, nitrate, sulphate, phosphate, turbidity and chloride content) of the sampled surface water were quantified. The mean values of the aforementioned physicochemical parameters were used in computing the water quality index (WQI). Rainfall data and water quality index was derived from data collected from secondary sources over a 7-year period (2012-2018). An additional experimental data was obtained for 2019 to help in forecasting the trend for the next one-and a half decade. The results revealed that the water quality were generally poor during the period under investigation. Furthermore, the results indicated that the increase in rainfall between 2012-2015 and 2018 led to corresponding reduction in water quality during these years. This was due to increase in runoffs of soluble ions and debris into the surface waters. The study also forecasted that there could be a rainfall increase of about 1500 mm in the next four years (2020-2023) while an increase of about 2000 mm from 2024-2029 could also be recorded within this period. The WQI forecast for the sample stations exposed variabilities in the water quality. The prediction indicates a steady increase in the WQI and the implication is that the water quality index would exceed the threshold value of 100, making the water quality unsuitable for dinking from 2024-2028 with a slight improvement from 2029-2034.

[269 words]