WATER QUALITY PARAMETERS OF SOME SELECTED RIVERS IN THE GREATER ACCRA REGION AND THEIR ENVIRONMENTAL PROTECTION NEEDS IN RELATION TO WATER CONSERVATTION POLICIES OF GHANA

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ABSTRACT

The study was conducted to provide environmental data needed for the assessment on the physicochemical and bacteriological quality of the Rivers Densu, Nsaki, Onukpa Wahe and Mamahuma in the Greater Accra Region and to establish whether these rivers harbour opportunistic pathogens of human health importance. The bio-physical and human influences that impact on the water quality of the rivers were also investigated. Attempt was made at finding the level of awareness of water conservation byelaws/regulations relevant to water conservation policies with the view to evaluate their application for the protection and conservation of the rivers.

Drainage map of the Greater Accra Region was used to map out ten sampling stations after reconnaissance survey. Appropriate physico-chemical parameters, bacteria loads and macro-invertebrates of the selected rivers were monitored using standard methodologies applied for such studies. Data collection was obtained through field studies, questionnaires and discussions.

The study showed that the quality of water has been affected by human activities in the catchments of the four rivers and that their waters are polluted. The concentrations of physico-chemical parameters recorded were generally beyond acceptable levels of the Environmental Protection Agency (EPA) of Ghana. The temperature (23.1C ó 31.8C), pH (7.25-9.26), turbidity (16NTU-635NTU) and suspended solids (2mg/l-159mg/l) in the Densu basin exceeded EPA of Ghana standards. The range of turbidity (12NTU-316NTU), suspended solids (7mg/l-453mg/l) and conductivity (174 μ S/cm-2980 μ S/cm) in the Sakumo II basin were also high and exceeded EPA of Ghana standards. Dissolved oxygen in the Densu

basin (0.11mg/l ó 6.44mg/l) and in the Sakumono II basin (0.62mg/l ó 6.22 mg/l) was relatively low. The nutrient levels; nitrate (0.3mg/l ó 3.0 mg/l; 0.1mg/l ó 4.8mg/l) and phosphate (0.05 mg/l ó 2.39 mg/l; 0.25 mg/l - 4.94 mg/l) were high in the Densu and Sakumo II basins. The rivers had high levels of faecal contamination. Levels of total coliforms (2.40log₁₀ cfu/100ml -5.44 log₁₀ cfu/100ml; 2.36 log₁₀ cfu/100ml -4.44 log₁₀ cfu/100ml), faecal coliforms (1.73 log₁₀ cfu/100ml -4.83 log₁₀ cfu/100ml;1.60 log₁₀ cfu/100ml ó 3.63 log₁₀ cfu/100ml) and faecal streptococci (2.25 log₁₀ cfu/100ml ó 5.33 log₁₀ cfu/100ml) in the Sakumo II and Densu basins were above the maximum permissible limits stipulated by EPA of Ghana regulations for drinking and domestic use. Macro-invertebrates such as Ephemenoptera, Anisoptera, Hemiptera and Gastropoda were frequently recorded in the rivers.

Major environmental threats found occurring along the basins were the indiscriminate defecation, waste disposal and fuel wood harvesting. The socio-economic implication of these observations on the local community and the need to incorporate environmental protection/conservation policies on rivers to ensure attitudinal change were also discussed.

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