

ANNUAL WATER QUALITY ASSESSMENT REPORT

TITLE : WATER QUALITY MONITORING OF SOUTHWESTERN AND COASTAL RIVER BASINS

DURATION : 1YEAR

COMMENCEMENT : FEBRUARY 2007

EXPECTED YEAR TO END: JANUARY 2008

SOURCES OF FUNDING : DANIDA

SUMMARY

Water Quality Assessments of the Southwestern and Coastal Rivers Systems were carried out in 19 locations (16 River stations and 3 Reservoir stations). The river basins are Densu, Ayensu, Ochi-Amisa, Ochi-Nakwa and Kakum of the Coastal Rivers System, and the Bia, Tano, Ankobra and Pra under the Southwestern Rivers System, the Weija, Barekese and Brimso Reservoirs were also considered. These rivers and reservoirs were sampled five times in the year. The sampling months were February, May, July, September and November 2007.

Field and laboratory measurements and assessments were carried out on the following physico-chemical and biological water quality parameters, namely, Temperature, pH, Conductivity and Total Suspended Solids (TSS) and Transparency, Nutrients, Major Ions, Trace Metals, Mico-Organic Pollutants and Bacteriological, Phytoplankton and Bed Sediments (particle size).

Temperatures of the rivers ranged from 20.6 to 31.6 °C with a pH range of 6.04 to 8.02 units. Dissolved oxygen (DO) values ranged from 4.00 to 8.10. The low DO values for most of the stations were recorded in February, September and November showed relatively higher DO values for most of the stations. Generally, February showed higher levels of conductivity which may be due to dominance of point sources of pollution. The Densu Basin showed the highest levels of conductivity which may be as a result of domestic and agricultural activities. The Highest conductivity values were recorded in February for all the stations. High total suspended solids levels were recorded in September and November as a result of discharges from non-point sources.

The rivers showed an overall ionic dominance pattern of $\text{Na} > \text{Ca} > \text{K} > \text{Mg}$, and $\text{HCO}_3 > \text{SO}_4 > \text{Cl}$. Thus like most tropical waters, there is dominance of Na and HCO_3 in the cationic and anionic components, respectively.

Biochemical Oxygen Demand in the reservoirs ranged from 0.800 to 10.1 mg/l. The highest BOD was recorded at Weija Reservoir (10.1 mg/l) in November. Weija Reservoir (6.22 mg/l) followed by Barekese Reservoir (4.82 mg/l), then by Brimso Reservoir (2.66 mg/l).

The highest BOD was recorded at Weija Reservoir (10.1 mg/l) in November. This may be as a result of high inputs of both domestic and agricultural wastes into the river. Transparency of the Reservoirs decreased in the order: Barekese (85.2 cm) > Weija (72.0 cm) > Brimso (62.4cm). Mean chlorophyll 'a' decreased in the order Weija (35.7 mg/m^3) > Barekese (12.8 mg/m^3) > Brimso (4.27 mg/m^3). Because Weija reservoir had the highest chlorophyll 'a' with resultant high biomass, it was not surprising to record the highest oxygen demanding substances.

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