

Seasonal variations in physico-chemical properties of the river Ganga of upstream and downstream areas in Kanpur, Uttar Pradesh, India

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Received October 18, 2017 and Accepted January 22, 2018

ABSTRACT: An assessment was performed to report the seasonal variations in the river water quality of Ganga upstream and downstream stations in Kanpur. Ranges of the estimated physico-chemical parameters are mentioned as temperature (16.6°C-29.5°C), pH (7.2-8.6), Total dissolved solids (331mg/l-397mg/l), Electrical conductivity (380µmhos/cm-510µmhos/cm), Total hardness (172 mg/l-212mg/l), Dissolved Oxygen (3.2mg/l-6.3mg/l), Biological Oxygen Demand (14mg/l-39mg/l), Chemical Oxygen Demand (37mg/l-46mg/l), Chloride (20mg/l-32mg/l), Nitrate (0.39mg/l-0.89mg/l) and Phosphates (0.32mg/l-1.23mg/l). EC, BOD, and COD were above the USPHS standards (300 µmhos/cm, 5mg/l and 4 mg/l, respectively) in the both upstream and downstream sites. Correlation coefficients revealed varied positive and negative correlations in physico-chemical parameters of the river water. Cluster analysis revealed physico-chemical parameters varied between the two clusters thus, indicated different sources of pollution. In this study, the river Ganga downstream area at Kanpur (Jajmau) is found much more polluted than upstream area Bithoor due to extreme anthropogenic disturbances in terms of tanneries and other industrial effluent input into the river.

Key Words : Physico-chemical parameters, correlation coefficients, cluster analysis.