

Assessment of Water Quality Concerning Slum Concentration and Its Impact on the River Ecosystem in the Doon Valley

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Abstract:

This study assesses physicochemical water quality parameters in relation to slum concentration and urban influence along major rivers in the Doon Valley, Uttarakhand. Twenty-three sampling locations were selected across the Rispana, Bindal, Suswa, Song, and Assan rivers, representing gradients from less impacted upstream sites to highly urbanised downstream areas. Parameters including pH, electrical conductivity (EC), dissolved oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD), total hardness (TH), sodium, potassium, nitrate, and sulphate were analysed according to APHA (2017) methods. Results showed spatial variation, with elevated EC, COD, and hardness in urban zones indicating anthropogenic impacts from waste discharge and runoff, while DO was higher in natural upstream sites and lower or unreported in several urban locations. Nitrate and sulphate concentrations remained low across all sites. A significant limitation is the absence of DO measurements at eight urban locations and the lack of microbial parameters, which constrains a comprehensive assessment of sewage-related pollution. It is recommended to implement targeted sanitation enhancements and maintain ongoing monitoring to safeguard the river ecosystems.

Keywords:

Water Quality, Doon Valley, Rispana River, Dissolved Oxygen, WasteWater Management, Urbanization.