

An Investigation of Interdisciplinary Techniques for Assessment of Water Quality in an Industrial Area

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Abstract : Rapid urbanization and industrialization have increased the demand of groundwater. However, the present era has evident an enormous level of groundwater pollution. Therefore, water quality assessment is paramount importance to evaluate its suitability for drinking, irrigation and industrial use. This study focus to evaluate the groundwater quality of an industrial city in eastern India through interdisciplinary techniques. The multi-purpose Water Quality Index (WQI) assess the suitability for drinking as well as irrigation of forty sampling locations, where 2.5% and 15% of sampling locations have excellent water quality (WQI:0-25) as well as 15% and 40% have good quality (WQI:25-50), which represents its suitability for drinking and irrigation respectively. However, the industrial water quality was assessed through Ryznar Stability Index (LSI), which affirmed that only 2.5% of sampling locations have neither corrosive nor scale forming properties (RSI: 6.2-6.8). These techniques with the integration of geographical information system (GIS) for spatial assessment indorsed its effectiveness to identify the regions where the water bodies are suitable to use for drinking, irrigation as well as industrial activities. Further, the sources of these contaminants were identified through factor analysis (FA), which revealed that both the geogenic as well as anthropogenic sources were responsible for groundwater pollution. This research demonstrates the effectiveness of statistical and GIS techniques for the analysis of environmental contaminants.

Keywords : groundwater, water quality analysis, water quality index, WQI, factor analysis, FA, spatial assessment

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