

A mathematical modeling with respect to DO for environmentally contaminated drinking water sources of Sagar city (M.P.), India: A case study

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Abstract. Dissolved oxygen is one of the most important parameters in aquatic systems. Oxygen gets into water by diffusion from the surrounding air, by aeration (rapid movement) and as a waste product of photosynthesis. Dissolved oxygen analysis measures the amount of gaseous oxygen (O₂) dissolved in an aqueous solution. DO is an absolute requirement for the metabolism of aerobic organisms and also influences inorganic chemical reactions. Therefore, knowledge of the solubility and interactions with other physico-chemical parameters is essential to interpreting both biological and chemical processes within water bodies. Water samples have been analyzed of 19 ground/municipal/reservoir sample collection places from March 2009 to February 2010 for their 15 physico - chemical parameters. Water temperature, colour, conductivity, turbidity, total solids, total dissolved solids, pH, alkalinity, chlorides, total hardness, dissolved oxygen, biological oxygen demand, chemical oxygen demand; iron and fluoride were analysed. From the results it is cleared that some parameters were beyond the limit of water quality standards led by WHO. The results thus obtained have been discussed in light of role and effect on DO, and influences of other parameter on DO. Keeping in view the composition of this standard resource an analysis of water samples of this city have been performed so as to derived a model for pollution and contamination with respect to DO and search their source as typical man made activities.

Keywords: ground water, physico-chemical parameters, mathematical model, multiregression analysis
