

LITERATURE SURVEY

Problem Statement : Prediction of water quality index using machine learning techniques

Sl no.	Literature Paper	Author	Inference
1	Assessment of drinking water quality:A case study of Ambala cantonment area,Haryana , India	Routh Chadetrik,Sharma Arabindh	Water is a vital resource for human survival. In the present study, the physicochemical characteristics of groundwater of Ambala Cantonment area were assessed for its suitability for drinking purposes. A total of 26 water samples were collected from deep aquifer based tube wells from different parts of Ambala Cantonment area. In order to assess the ground water quality, the water samples were analyzed for different physicochemical properties, e.g., pH, electrical conductivity (EC), total dissolved solids (TDS), calcium, magnesium, total hardness (TH), sodium, potassium, carbonate, bicarbonate, total alkalinity (TA), chloride, fluoride and sulphate concentrations. The results were compared with the standards prescribed by World Health Organization (WHO) and Bureau of Indian Standard (BIS). All the physiochemical parameters were found to be in the prescribed permissible limit. The correlation matrix was also calculated for different parameters of drinking water. From the pH values it is clear that the ground water of the study area is alkaline in nature and the total hardness varies in between 116.6129.4 mg/l, which indicates that water in the deep aquifer is moderately hard. Hence it is suggested to the cantonment localities to soften the tube well water before consumption.
2	Impact of Irrigation Water Quality on human health:A case study in India	Jeena.T.Srinivasan,V.Ratna Reddy	It is seen that higher rates of morbidity exist in the wastewater irrigated villages when compared to the control village. Specifically, adult and female morbidity rates are significantly higher than child and male morbidity rates. From the logit analysis it is seen that exposure to wastewater and engagement in activities based on it places the households in higher risk groups to report morbidity. Small and marginal farmers incur higher economic cost of illness. However, it has

			<p>been difficult to ascertain the cause and effect relationship as most of the households have reported more common illnesses like fever, head ache, skin itching, stomach ailments, etc. The study points out the need for a comprehensive risk assessment and adoption of risk management measures including setting standards for treatment and discharge of wastewater and regulations on the type of uses etc. to prevent unplanned use of untreated or partially treated wastewater while taking into account local conditions.</p>
3	Impact of informal regulation of pollution on water quality in rivers in India	Nandini Banarjee, Bishwanath Goldar	<p>In this paper an attempt is made to assess the impact of informal regulation of water pollution on water quality in Indian rivers. For this purpose, an econometric analysis of determinants of water quality in Indian rivers is carried out using water quality (water class) data for 106 monitoring points on 10 important rivers for five years, 1995–1999. To explain variations in water quality, an Ordered Probit model is estimated, in which poll percentage in parliamentary elections, a proxy for the intensity of informal regulation, is taken as one of the main explanatory variables. Rainfall, industrialization, irrigation intensity and fertilizer use are some of the other explanatory variables used in the model to control for the influence of these factors. As expected, river water quality is found to be positively related with rainfall, and negatively related with industrialization, irrigation intensity and fertilizer use. A significant positive relationship is found between poll percentage and water quality, and also between the rate of increase in literacy level in a district and the water quality in rivers flowing through the district. These results point to a significant favorable effect of informal regulation of pollution on water quality in rivers in India.</p>
4	Challenges of sustainable water quality management in rural India	R.Srikanth	<p>High rates of mortality and morbidity due to water-borne diseases are well known in India. Serious degradation of water quality in urban India has often been attributed to indiscriminate disposal of sewage and</p>

			<p>industrial effluents into surface water bodies. Although some degree of intervention in terms of chlorination and monitoring of water quality exists in major cities and towns, rural India, which constitutes the bulk (70%) of the population, is usually deprived of such interventions. The population in rural India is mainly dependent on the groundwater as a source of drinking water. As a quality concern the groundwater is often found to be contaminated with fluoride, arsenic, iron and salts. In recent years, fluorosis has emerged as major public health issue in rural India. At the technical level, some progress has been made in the development and use of field-level diagnostic kits. Decentralization of health-related monitoring at the villages needs to be institutionalized and this requires capacity development at all levels. This article discusses the various components that impact effective water quality management in rural India. Experience suggests that redesigning of data management programme at village, district and at national level, upgradation of district-level laboratories and addressing technical, legal and institutional components should become the first steps in achieving effective water-quality management and providing better health to millions of people living in rural India.</p>
5	<p>A study on water quality prediction by a hybrid CNN-LSTM model with attention mechanism</p>	<p>Yurong Yang, Qingyu Xiong, Chao Wu, Qinghong Zou, Yang Yu, Hualing Yi & Min Gao</p>	<p>The water environment plays an essential role in the mangrove wetland ecosystem. Predicting water quality will help us better protect water resources from pollution, allowing the mangrove ecosystem to perform its normal ecological role. New approaches to solve such nonlinear problems need further research since the complexity of water quality data and they are easily affected by the noise. In this paper, we propose a water quality prediction model named CNN-LSTM with Attention (CLA) to predict the water</p>

			<p>quality variables. We conduct a case study on the water quality dataset of Beilun Estuary to predict pH and NH₃-N. Linear interpolation and wavelet techniques are used for missing data filling and data denoising, respectively. The hybrid model CNN-LSTM is highly capable of resolving nonlinear time series prediction problems, and the attention mechanism captures longer time dependence. The experimental results show that our model outperforms other ones, and can predict with different time lags in a stable manner.</p>
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