

EFFICIENT WATER QUALITY ANALYSIS & PREDICTION USING MACHINE LEARNING

Dharani. G, Jayapriya. K. S, Revathi. S, Suvalakshmi. D

Project description:

Water is considered as a vital resource that affects various aspects of human health and lives. The quality of water is a major concern for people living in urban areas. The quality of water serves as a powerful environmental determinant and a foundation for the prevention and control of waterborne diseases. However predicting the urban water quality is a challenging task since the water quality varies in urban spaces non-linearly and depends on multiple factors, such as meteorology, water usage patterns, and land uses, so this project aims at building a Machine Learning (ML) model to Predict Water Quality by considering all water quality standard indicators.

Literature survey:

1. Assessment of ground water quality and its Impact in around Mangalam near Tirupati ; G.DILLI RANI, M.SUMAN, C.NARASIMHA RAO, P.REDDIRANI, R.PRATHIBA V.G.PRASHANTH, P. VENKATESWARLU Ground water quality and its impact on human health in and around Mangalam, near Tirupathi, India was assessed. Water samples were collected from 8 different areas in and around Mangalam and analyzed for physicochemical parameters such as pH, electrical conductivity, total dissolved solids, total hardness, calcium, chlorides, sulphates, nitrates and dissolved oxygen. The found values of physicochemical parameters were compared with the World Health Organisation water quality standards. Based on the analysis, it was found that ground water of some of the areas was polluted and not suitable for drinking purpose. Thus the ground water of the area needs purification before drinking.

2. Analysis of Drinking Water Quality and its Impact on human health in Chandragiri, near Tirupati, India. S.V.DORAIRAJU, C. NARASIMHARAO, M. BUJAGENDRA RAJU, AND P.V.CHALAPATHI. Drinking water samples were collected from different locations of Chandragiri, near Tirupati, Andhra Pradesh, India and analyzed to assess physicochemical parameters and suitability of water for drinking purpose. Physicochemical parameters such as pH, hardness, alkalinity, calcium, magnesium, iron,

nitrates, chlorides, sulphates, electrical conductivity, total solids (TS), total dissolved solids (TDS), total suspended solids (TSS), dissolved oxygen (DO), chemical oxygen demand (COD) and bio chemical oxygen demand (BOD) were determined. The found values were compared with the World Health Organisation water quality standards. Interpretation of data shows that drinking water of some of the areas was polluted and not suitable for drinking purpose. Thus the ground water of these areas needs purification before drinking.

3. Hydro chemical characterization of ground water in around tirupati areaE. Balaji, A. Nagaraju, Y. Sreedhar, A. Thejaswini, Zahed Sharifi In the management of water resources, quality of water is just as important as its quantity. The main aim of this study has been to assess the variability of groundwater parameters to develop water quality of Tirupati area and its suitability for domestic and irrigation purpose. Further, the samples were analyzed for pH, EC, TDS, carbonates, bicarbonates, alkalinity, chlorides, sulfates, hardness, fluoride, calcium, magnesium, sodium, and potassium. Based on the analytical results, chemical indices like percent sodium, sodium absorption ratio (SAR), adjusted SAR, percent sodium (Na %), residual sodium carbonate (RSC) and permeability index (PI) have been calculated. Chadha rectangular diagram for geochemical classification and hydro chemical processes of groundwater indicated that most of waters are Ca–Mg–HCO₃ and Ca–Mg–Cl types. Assessment of water samples from various methods indicated that majority of the water samples are suitable for domestic and irrigation purpose.

4. Statistical and Analytical Evaluation of ground water quality of Tirupati Area, A.Naraju, Z. Sharifi, E. Balaji. The multivariate statistical analysis, hydro geochemical modelling using visual MINTEQ software, indices of base exchange and Gibbs ratio were simultaneously applied to groundwater hydro chemical data of the Tirupati area. These techniques were applied to know the principal processes controlling the water chemistry. Fifty groundwater samples were analysed for pH, electrical conductivity (EC), Ca, Mg, Na, K, HCO₃, CO₃, Cl, and SO₄. The results showed that the abundance of the major ions in the water samples is in following order: Na > Ca > Mg > K and HCO₃ > Cl > SO₄ > CO₃ > F.

5. The Physico-Chemical And Bacteriological Analysis Of Ground Water In Around Tirupati- R. Usha, A. Vasavi, Spoorthi And P.M.Swamy. In the present study, an attempt has been made to investigate the quality of ground water in and Around Tirupati, Chittoor District, Andhra Pradesh. The various parameters monitored include pH, Temperature, Total Suspended Solids, Total Dissolved Solids, Total Solids, Dissolved Oxygen, Biochemical Oxygen Demand, Alkalinity, Chlorides, Hardness and Colony Count. The results showed that all water samples have neutral pH,.

6. Groundwater Quality Assessment using Correlation and Regression Model in Tirupati, Ambiga Kannapiran . Groundwater is the most important natural source required for drinking to the public's around the world, particularly in rural areas. An attempt has been made in order to determine the spatial distribution of groundwater quality parameters and to study the correlation and regression

method. The physical and chemical analysis results were compared to the standard guideline values as recommended by the Bureau of Indian standards for drinking and public health in order to have an indication of the present groundwater quality.

7. Analysis of Physico-Chemical Characteristics of Industrial Effluents in Tirupati- Putaka Ramesh, K. Abraham, B. suresh, T. Damodharam . Physico-chemical characteristics of industrial effluents were collected from three industrial sites in and around Tirupati. Industrial effluents were studied in two years month by month from Jan 2014 - Dec 2015. The present research work deals with the study of some of the important physicochemical parameters of industrial waste water collected from Tirupati industrial region. Results indicated that pH values of effluent samples.

8. Determination of heavy metals in surface water and ground water in and around Tirupati-V. Hanuman Reddy, P.M.N. Prasad, A.V. Ramana Reddy and Y.V. Rami Reddy Water Quality is one of the most important concerns. The heavy metals levels up to ppb levels in drinking water quality may cause seivour health problems and also cause cancer. In this study we made an attempt to know the concentration of eight heavy metals in ground water and surface water in different locations of Tirupati, Chittoor District, Andhra Pradesh up to ppb levels.

9. Statistical Analysis of the Hydro geochemical Evolution of Ground water in Rangampeta area of Tirupati – A. Nagaraju, K. Sunil Kumar, A. Thejaswini, Z. Sharisi Multivariate statistical techniques involving factor analysis (FA) and R-mode hierarchical cluster analysis (HCA) were performed on 30 groundwater samples from Rangampeta, Chittoor District, Andhra Pradesh, South India to extract principal processes controlling the water chemistry. The groundwater samples were analyzed for distribution of chemical elements Ca, Mg, Na, K, Si, HCO₃, CO₃, Cl, and SO₄. It also includes pH, and electrical conductivity (EC).

10. Testing of Ground Water Quality For drinking purpose in Tirupati- Dr. R. Bhavani and smt. S. Sharada Testing of groundwater quality is very important before using it for drinking purpose. In the present study ten samples at various locations of Tirupati were collected and the values of various chemical parameters like total dissolved solids (TDS), pH, chlorides, hardness, sulphates and fluorides were determined. These values were compared with Drinking water standards of IS: 10500-1991 to assess the suitability for drinking purpose.

11. Water Quality monitoring on Tirumala and Tirupati- K. Raju, T. Damodharam. An attempt has been made to evaluate the water quality of supplemented and ground water in Tirumala and Tirupati, Chittoor District, Andhra Pradesh, India. The Tirumala and Tirupati are the most popular pilgrimage and education areas in Andhra Pradesh. Twelve areas of Tirumala and Tirupati have been selected, where the peoples are used supplemented and groundwater for drinking purpose, and the

water samples were subjected to systematic analysis with a view to understand the potability of drinking water sources.

12. Seasonal assessment of water quality in Tirupati- Tho Damodharam, S. Suresh. Water quality studies were conducted for surface and sub-surface water in Tirupati. Water was monitored during summer, winter and rainy seasons to assess the status and identify the impacts due to domestic, industrial and agricultural activities. Water quality assessments showed that the treated surface water supplied to Tirupati and Tirumula are within the limits of Indian standards for drinking water whereas sub surface water at certain locations near agricultural and drainage areas varied seasonally and showed higher values of hardness and chloride in April and December exceeding the limits. Seasonal assessment of water quality in Tirupati, A.P. India.