

Air Quality Assessment Tamil Nadu

Project Definition:

The project aims to analyze and visualize air quality in Tamil Nadu using IBM Cognos.

The objective is to create Reports, Dashboard based on the dataset. To analyze and gain insights into air pollution trends, identifying areas with high pollution level and to develop a predictive model to estimate RSPM/PM10 levels based on SO2 and NO2 levels. This project encompasses defining objective, designing the analysis approach, selecting a relevant visualization technique using IBM Cognos and creating a predictive model using Python and relevant libraries.

Design Thinking:

1. Project Objective:

- Analyze air quality trends.
- Identifying pollution hotspots using visualization technique.
- To build a predictive model for RSPM/PM10 levels based on SO2 and NO2 levels using Python and relevant libraries.

2. Analysis Approach:

- Monitoring Network Design:

Establish a strategically located network of air quality monitoring stations across urban, suburban, and rural areas of Tamil Nadu.

- Real-Time Data Collection:

Implement continuous real-time monitoring of key air pollutants, including PM2.5, PM10, NO2, SO2, CO, and O3.

- Meteorological Data Integration:

Integrate meteorological data into the analysis to understand the influence of weather conditions on air quality.

- Data Quality Assurance:

Implement rigorous data quality assurance measures to validate and ensure the reliability of collected data.

- Source Apportionment Studies:

Conduct source apportionment studies to identify and quantify the major sources of air pollution.

- Dispersion Modeling:

Employ dispersion modeling to simulate the transport and dispersion of pollutants in the atmosphere.

- Temporal and Spatial Analysis:

Analyze temporal trends to identify patterns and seasonal variations in air quality. Conduct spatial analysis to understand pollution hotspots and variations across different regions of Tamil Nadu.

- Health Impact Assessment:

Evaluate the health implications of air pollution by correlating air quality data with epidemiological studies.

- Community Surveys and Feedback:

Engage with local communities through surveys and feedback mechanisms to gather qualitative insights. Understand community perceptions of air quality issues and incorporate local knowledge into the analysis.

- Data Visualization:

Utilize data visualization techniques to present complex air quality information in an understandable and accessible manner using IBM Cognos.

- Continuous Monitoring and Adaptive Management:

Implement a continuous monitoring system and adaptive management approach. Regularly review and update strategies based on ongoing monitoring data and emerging trends in air quality.

3. Visualization Selection:

Based on the given dataset we will select the visualization technique to effectively represent air quality trends and pollution levels by using IBM Cognos.

- Pie Charts for Composition:
 - Use pie charts to illustrate the composition of air pollutants in a specific location.
 - Provide a clear breakdown of the contribution of each pollutant to overall air quality.
- Time Series Charts:
 - Create line charts to depict temporal trends in air quality over a selected time period.
 - Use color-coded lines for different pollutants, allowing easy comparison.
- Heat Maps:
 - Employ heat maps to represent spatial variations in air quality across Tamil Nadu.
 - Integrate geographical features to enhance context and understanding.
- Box Plots:
 - Showcase the distribution of air quality parameters, highlighting median, quartiles, and outliers.
 - Provide a comprehensive view of the variability in pollutant levels.

Conclusion:

We aim to contribute to improved air quality management in Tamil Nadu, empowering decision makers and the public with valuable insights for proactive measures. By combining these visualization technique, we can create a comprehensive and intuitive IBM Cognos Analytics Report and Dashboard for effective communication and interpretation of air quality data in Tamil Nadu.