India Air Pollution Tableau Dashboard Documentation

By Aditya Abhiram

Project Overview

The India Air Pollution Tableau Dashboard aims to provide a comprehensive analysis of air quality trends in India and their relationship with environmental policy changes. This project utilizes the Historical Daily Ambient Air Quality Data released by the Ministry of Environment and Forests and Central Pollution Control Board of India.
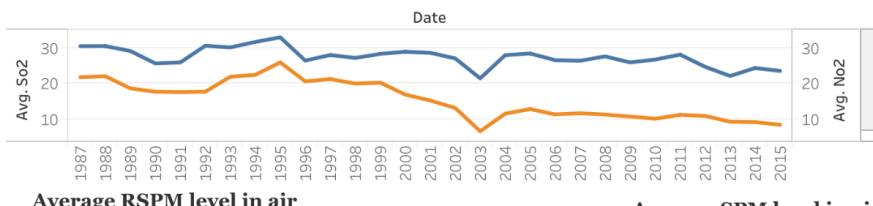
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DATASET LINK:

https://drive.google.com/file/d/1u3qaJLRNS0LPEzd6QNlrGt2IDgJEPfCk/view?usp=drive_link

TABLEAU PUBLIC LINK:

https://public.tableau.com/app/profile/vadegharu.aditya.abhiram/viz/AirQualityMonitoring_17117967842000/AirQualityMonitoring
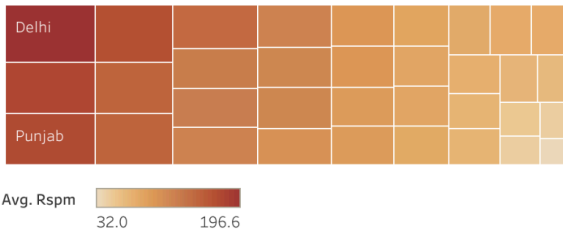
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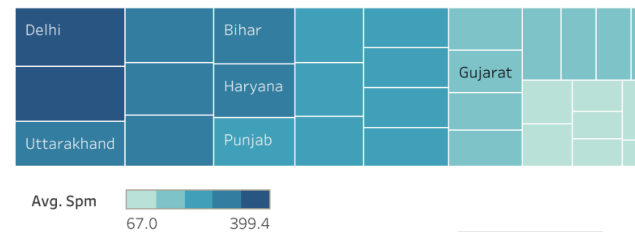**Yearly Average Levels of SO2 and NO2 in Air (1987 - 2015)**

Air Quality Surveillance
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Measure Names
- Avg. No2
- Avg. So2

Average RSPM level in air

Avg. Rspm 32.0 — 196.6

Average SPM level in air

Avg. Spm 67.0 — 399.4

Avg. So2 5.26 — 27.13

Areawise average levels of No2 and So2 in air
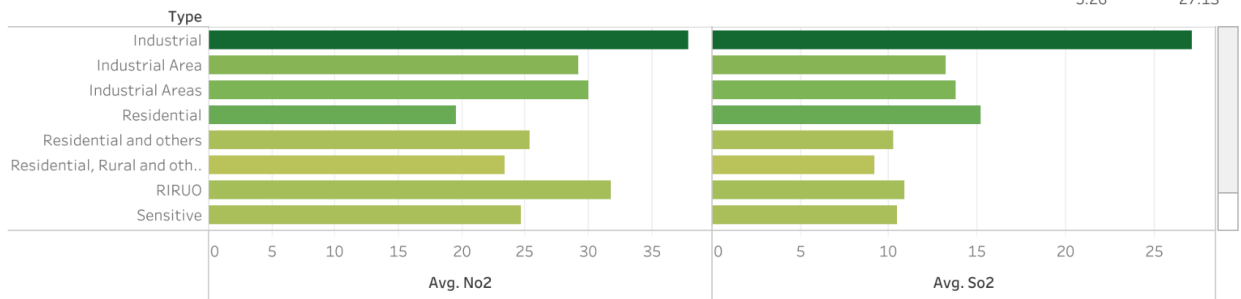
Relationship between Average SPM and RSPM by State

Avg. No2 18.06 — 37.86
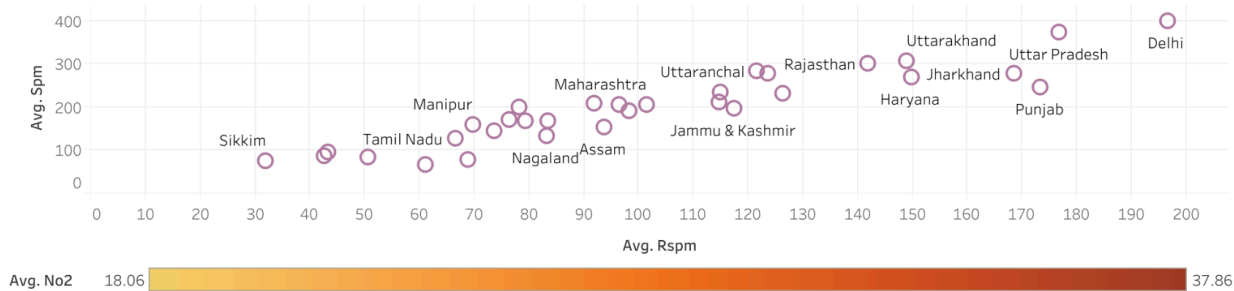
Average So2 and No2 Levels by Area
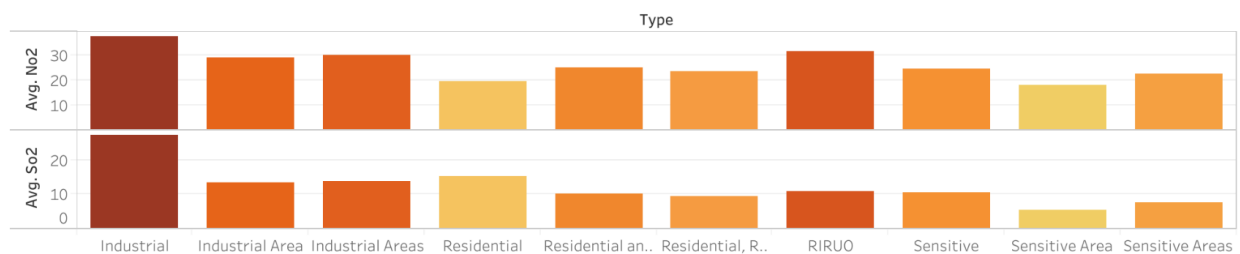
Steps for Dashboard Creation

1. Data Collection and Preparation

- Acquire the Historical Daily Ambient Air Quality Data from reliable sources.
- Clean and preprocess the data to ensure consistency and accuracy.
- Combine data across years and states to create a unified dataset for analysis.

2. Design Dashboard Layout

- Plan the layout to include map visualization, time series charts, policy change timeline, filter options, comparative analysis, top pollutant analysis, and insightful annotations.
- Ensure a user-friendly and intuitive interface for easy navigation.

3. Create Visualizations

- Develop map visualizations to represent air quality levels across different states or regions in India.
- Construct time series line charts to depict changes in air quality over the years.
- Integrate a timeline component to showcase key environmental policy changes.
- Implement filters for users to customize their views based on specific criteria.
- Include comparative charts and top pollutant analysis to provide deeper insights into air quality variations.

4. Enhance Interactivity

- Add interactive elements such as tooltips, hover effects, and click actions to enhance user experience.
- Ensure seamless interaction with visualizations and filters for dynamic exploration of the data.

5. Test and Refine

- Thoroughly test the dashboard for functionality, usability, and visual appeal.
- Address any issues or bugs encountered during testing.
- Refine the dashboard layout and visualizations as needed to optimize performance and user engagement.

6. Document Design Choices and Rationale

- Document the rationale behind each visualization choice, including color schemes, chart types, and data representation.
- Explain the reasoning behind the layout design and interactive features implemented in the dashboard.
- Provide insights into any challenges faced during the Tableau dashboard creation process and the solutions adopted to overcome them.

Design Choices and Rationale

- Map Visualization: Chosen to provide a spatial representation of air quality levels across different regions in India, allowing users to quickly identify areas with high pollution levels.
- Time Series Charts: Used to visualize temporal trends in air quality, enabling users to identify seasonal patterns and long-term trends.
- Policy Change Timeline: Integrated to provide context for environmental policy interventions and their potential impact on air quality.
- Filter Options: Implemented to allow users to customize their views based on specific states, time periods, or pollutant types, enhancing the dashboard's flexibility and relevance to users' research questions.

- Comparative Analysis: Included to facilitate comparisons between different states or regions, helping users identify disparities in air quality metrics.
- Top Pollutant Analysis: Added to highlight the main contributors to poor air quality, aiding in the identification of priority areas for intervention.
- Insightful Annotations: Utilized to provide context and explanations for key data points, events, or trends, enhancing the interpretability of the visualizations.

Insights and Conclusions

- Analysis of the air quality data revealed significant variations in pollution levels across different states and regions in India.
- Time series analysis identified seasonal trends in air quality, with pollution levels typically peaking during certain months of the year.
- Integration of the policy change timeline highlighted key environmental policy interventions and their potential impact on air quality improvements.
- Comparative analysis facilitated the identification of regions with particularly poor air quality, guiding policymakers in targeting interventions effectively.
- Top pollutant analysis shed light on the main contributors to air pollution, informing strategies for pollution mitigation and control.
- Overall, the dashboard provides valuable insights into India's air pollution dynamics and underscores the importance of targeted policy interventions in addressing this pressing environmental issue.