AIR QUALITY INDEX INVESTIGATES WORSENING OF AIR POLLUTION LEVELS IN INDIA.

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ABSTRACT: -

Air Quality Index (AQI) is a powerful tool for reporting the level of severity in air quality. The Air quality index objective is to make aware individuals about how local air quality affects their health.

In India, the Central Pollution Control Board estimates air pollution and establishes national air quality regulations to protect public health.

The AQI computed by monitoring five different pollutants viz. Ozone, Nitrogen dioxide [NO2], Sulphur dioxide [SO2], Carbon Monoxide [CO], Ammonia [NH3] and two particulate matter i.e. Particulate Matter 10 [PM 10] and Particulate Matter 2.5 [PM 2.5].

The main purpose of this research is to analyse the quality of air which can be used as a basis for taking possible steps and decisions rendering it fit for human consumption.

INTRODUCTION: -

The whole globe is wrapped up by the sheath of air pollution. It is among the leading causes of mortality globally. Air Quality Index is one such method for canvassing the air we breathe, and it is used to produce total results based on the country's regulations and rules.Air quality index is categorized with a scale of 0 to 500.

Fig. 1. Air Quality Standard

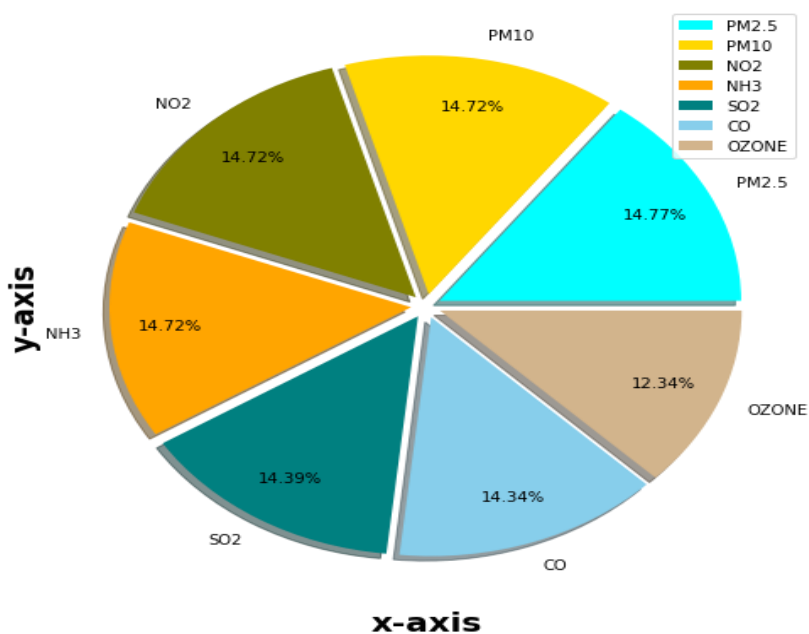The AQI evaluates contaminants that have a severe impact on human health (PM10, PM2.5, CO, NO2, O3, SO2, NH3).

Fig. 2. Different pollutants represented as percentage
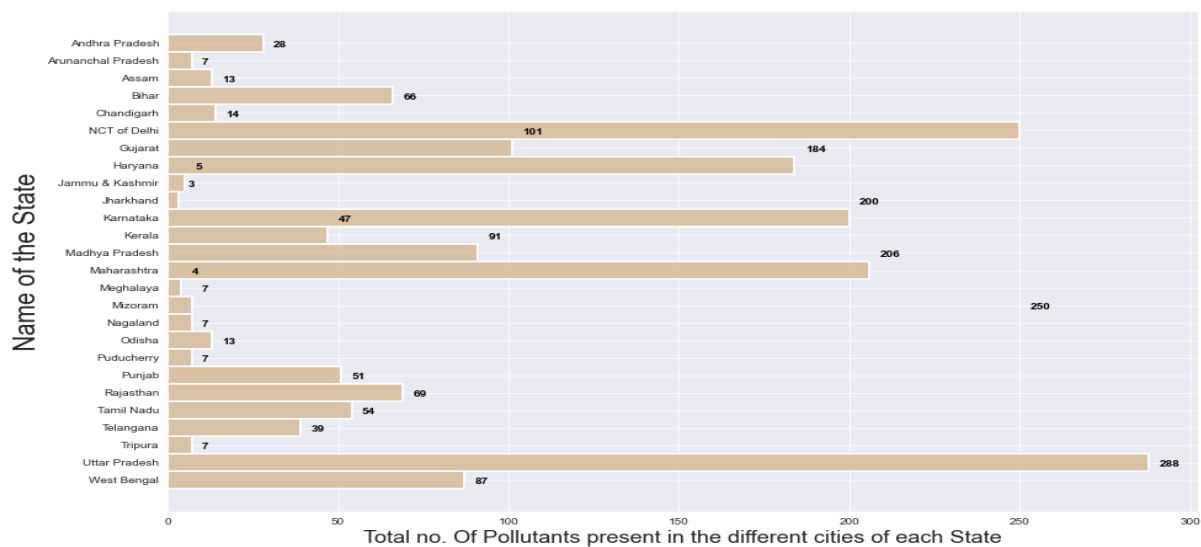
AQI OF DIFFERENT STATES OF INDIA

Fig. 3. Total no. of pollutants presents in the different cities of each state
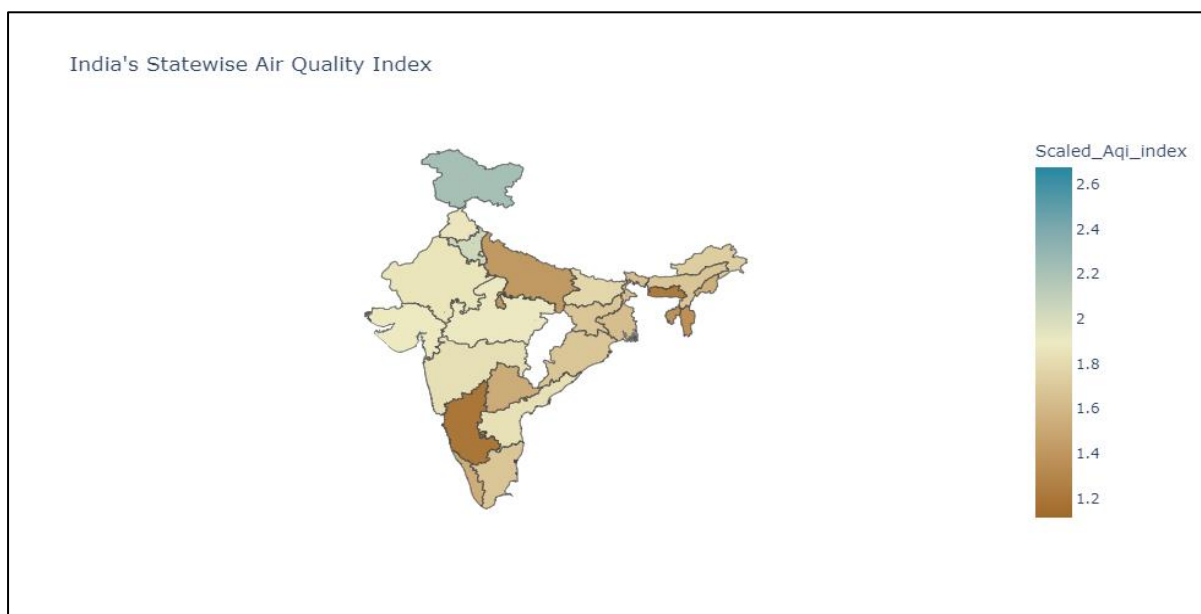

Fig. 4. India's state-wise air quality index

METHODOLOGY: -

Data is collected from all-over the country in real time for only one day. This dataset has some missing values and is used for the analysis of the air quality index. The median and mean, were used to impute

this missing value. Using data insights, we identified that Particulate matter 10 is the Predominant Parameter across the country.
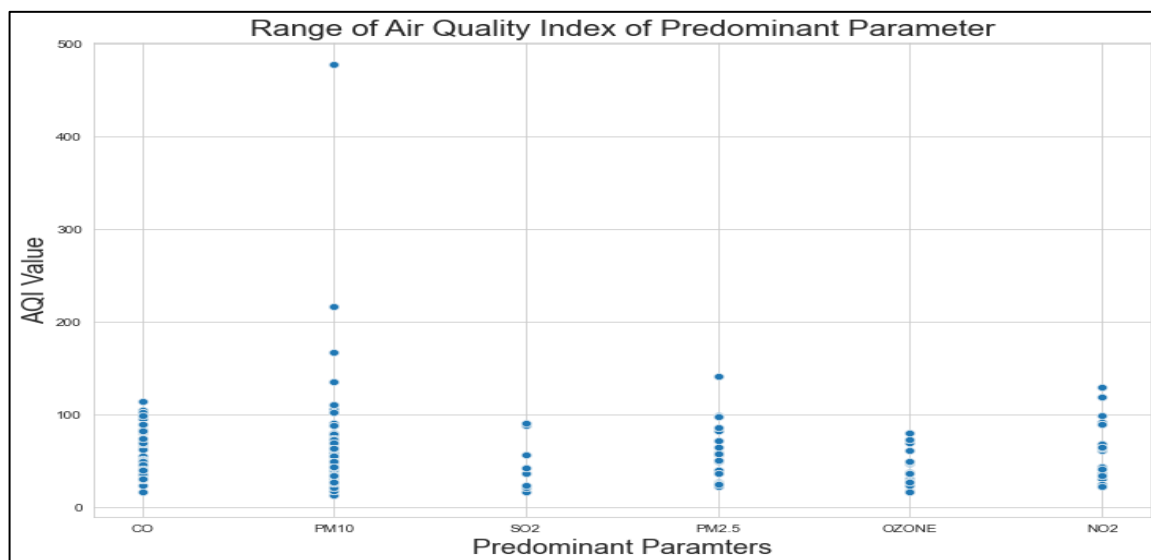

Fig. 5. Range of Air quality index of predominant parameter

RESULT AND CONCLUSION: -

According to the AQI study, particulate matter (mostly PM10) was also recognized as the most prevalent contaminant in the index value.
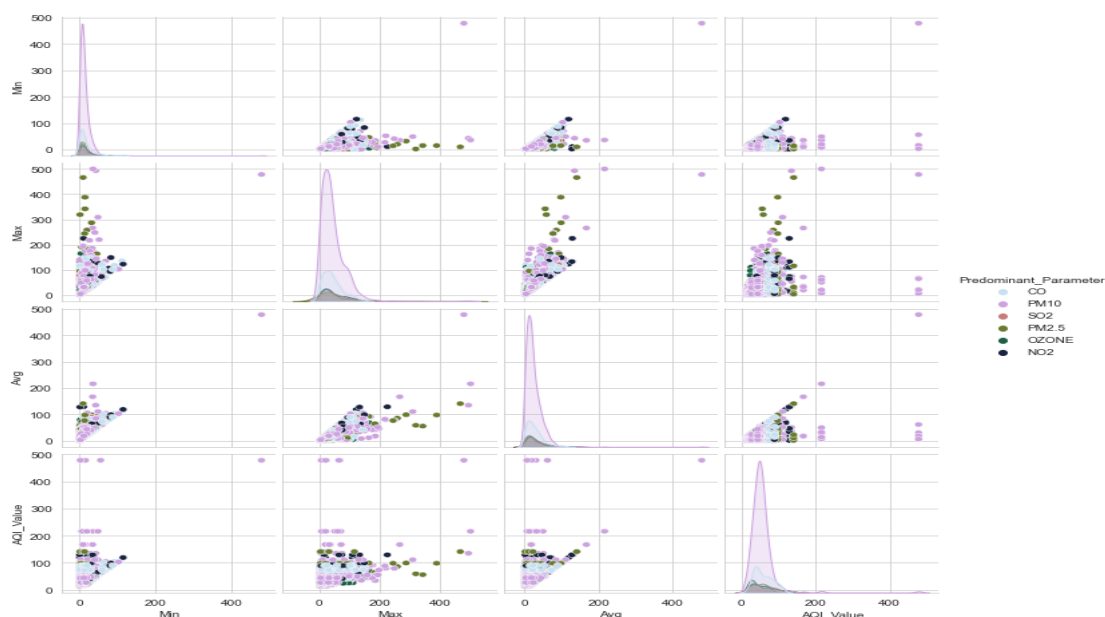

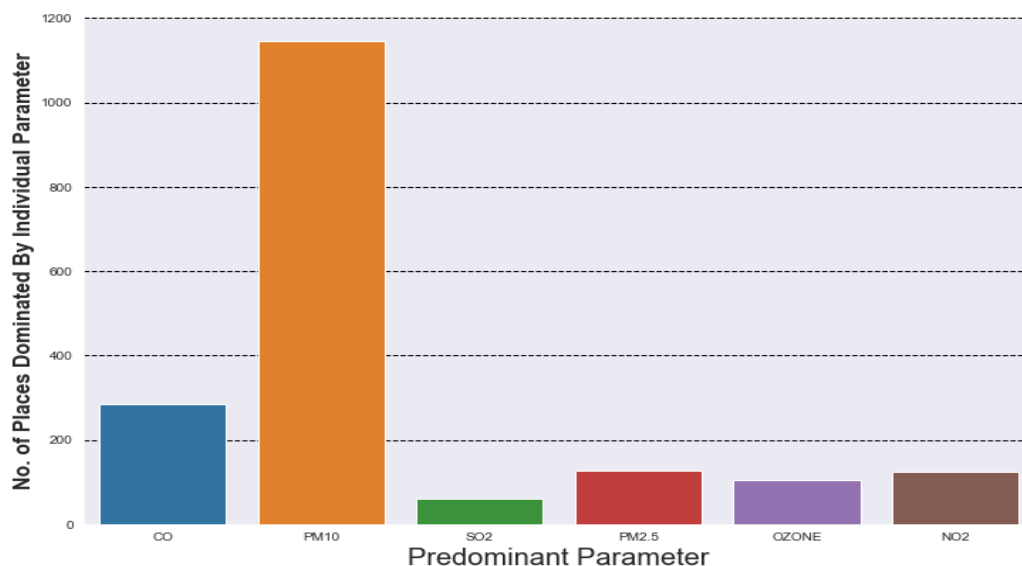**Fig. 6. Pair plot of different pollutants**

Fig. 7. Predominant parameter of different pollutants

For the benefit of civic life, we must seek for proper pollution control and management plans, such as plantations and green belts.

- **Good (0–50) -** Minimal Impact

- **Satisfactory (51–100) -** May cause minor breathing difficulties in sensitive people.

- **Moderately polluted (101–200)** - May cause breathing difficulties in people with lung disease like asthma, and discomfort to people with heart disease, children, and older adults.

- **Poor (201–300) -** May cause breathing difficulties in people on prolonged exposure, and discomfort to people with heart disease

- **Very Poor (301–400) -** May cause respiratory illness in people on prolonged exposure. Effect may be more pronounced in people with lung and heart diseases.

- **Severe (401-500) -** May cause respiratory issues in healthy people, and serious health issues in people with lung/heart disease. Difficulties may be experienced even during light physical activity.

Dataset and variable selection—considering a large dataset with more parameters and measurements, which can support more accurate air pollution and particulate forecasting models. For predicting the air quality index, data science can be highly useful. And, based on the predictions, we can take whatever steps are necessary to clean up our environment.