iFOREST

INTERNATIONAL
FORUM
FOR ENVIRONMENT,
SUSTAINABILITY
& TECHNOLOGY

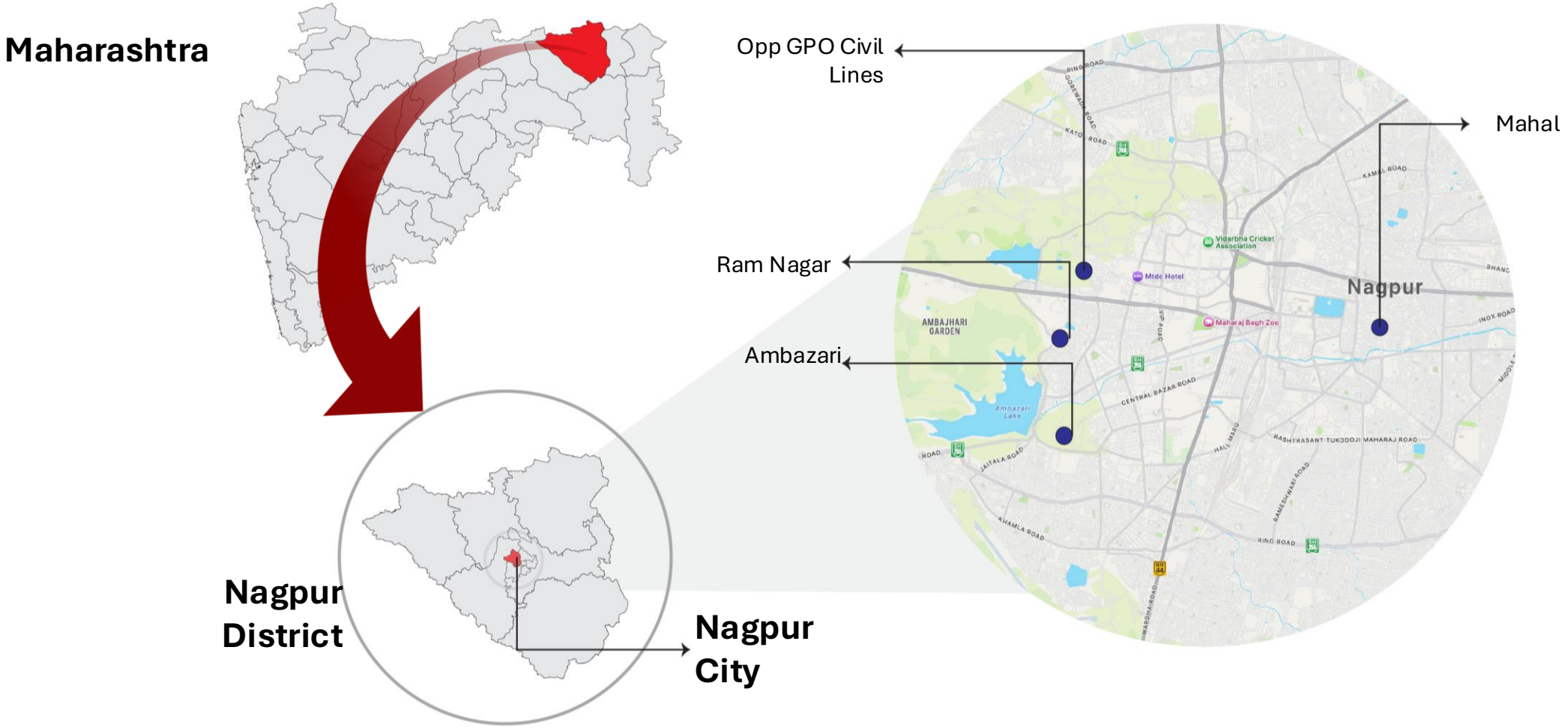
Know your city and what you breathe

Air Pollution - What it Looks Like?

Source:

1) Nagpur Today, Times of India
2) https://www.aqi.in/in/dashboard/india/maharashtra/nagpur

Study Area


Maharashtra
Opp GPO Civil Lines
Mahal
Ram Nagar
Ambazari
Nagpur
Nagpur District
Nagpur City
Vidarbha Cricket Association
Mtdc Hotel
Maharaj Bagh Zoo
AMBAJHARI GARDEN
Ambazari Lake
KAMAL ROAD
CENTRAL BAZAR ROAD
JAITALA ROAD
KHAMLA ROAD
RING ROAD
INOX ROAD

Study Area

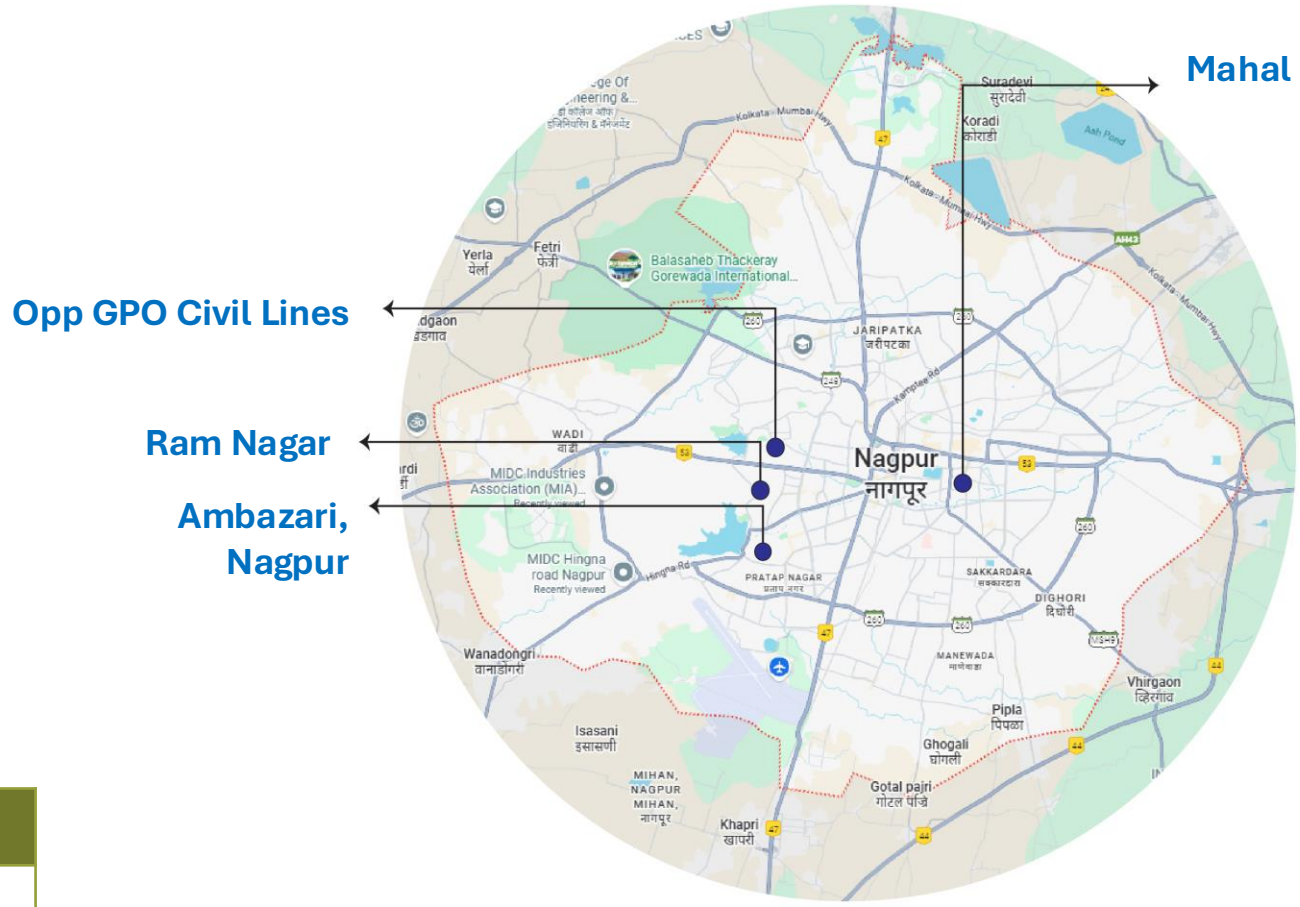
City Demographics

218 KM²

Total Area

35.17 Lakhs

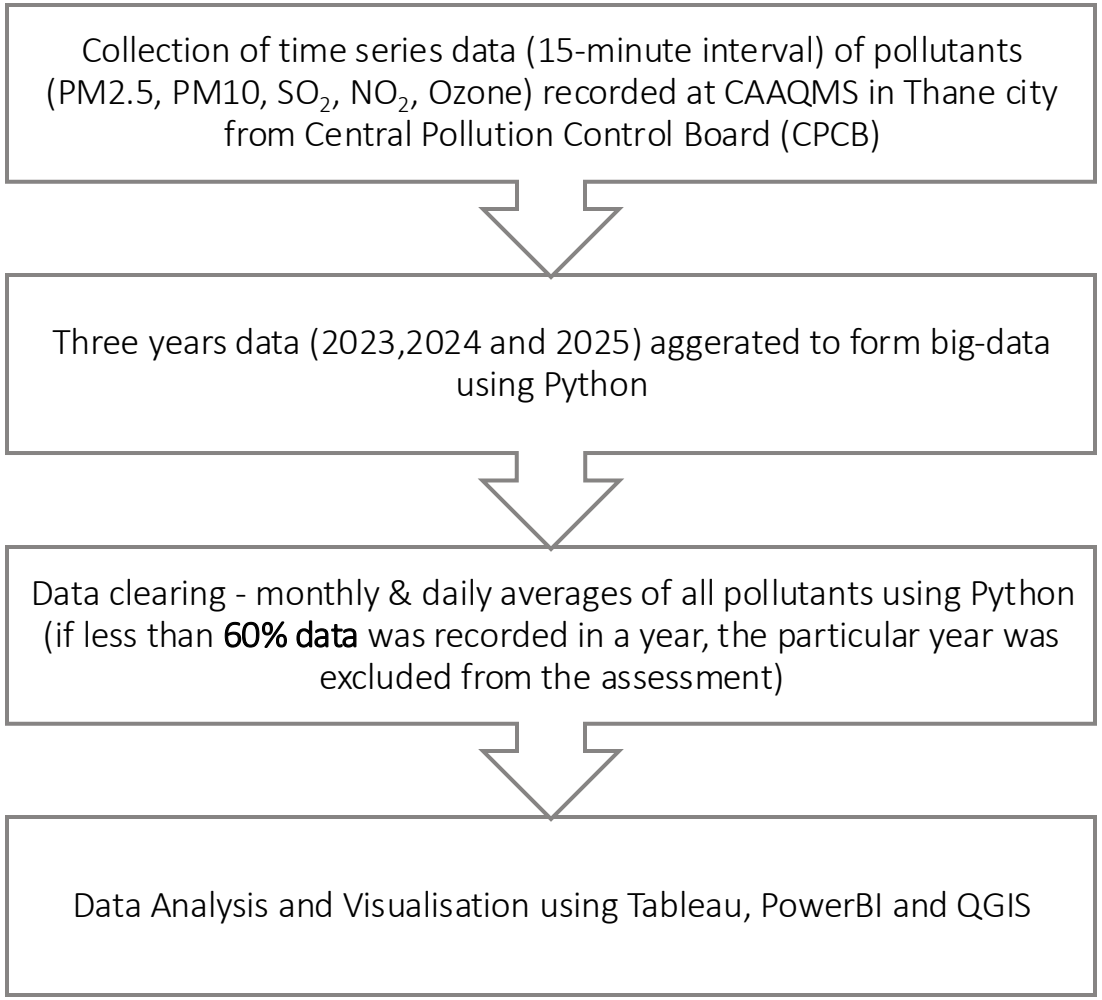
Total Population



Required no of stations

	CAAQMS	Manual	Total
Available	4	7	11
Required	5	3	8

Approach - Data Cleaning



Results – Annual Average 2024

PM10 - 88.43 µg/m³
PM2.5 - 47.70 µg/m³

Opp GPO Civil Lines

PM10 - 99.22 µg/m³
PM2.5 - 49.12 µg/m³

Ram Nagar

PM10 - 98.38 µg/m³
PM2.5 - 47.86 µg/m³

Ambazari

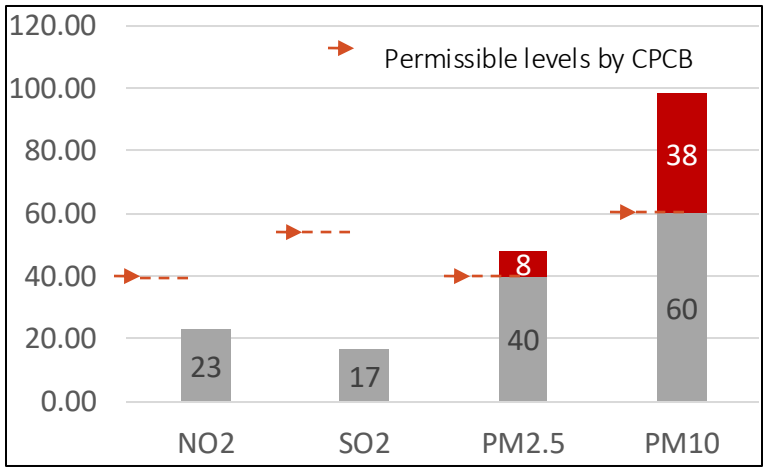
Mahal

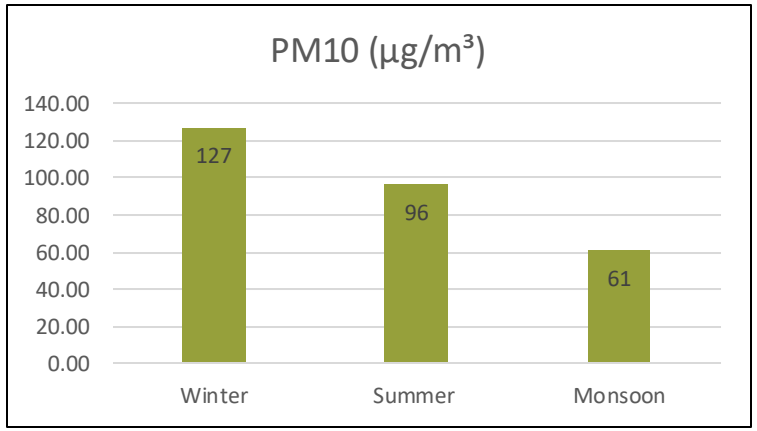
PM10 - 98.76 µg/m³
PM2.5 - 47.05 µg/m³

Annual Avg Concentration (2024)

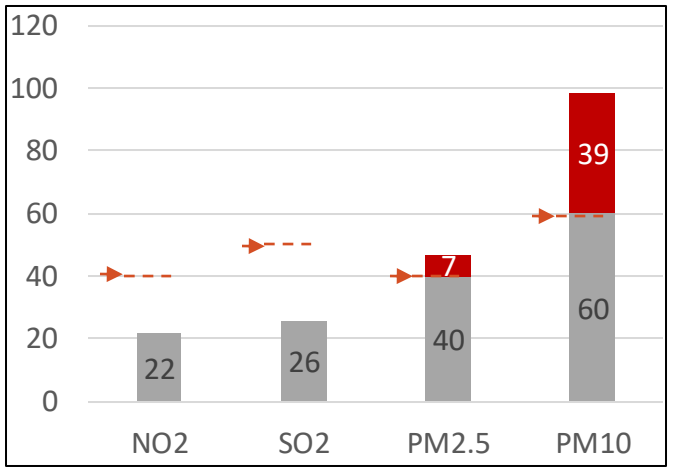
Pollutant concentration 2024 (µg/m³)

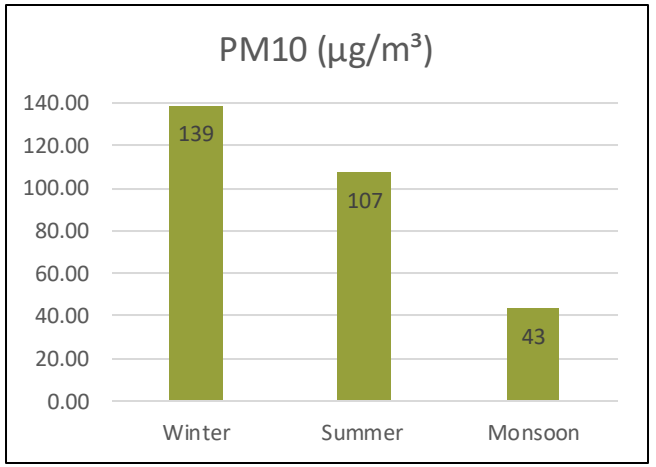
Ambazari



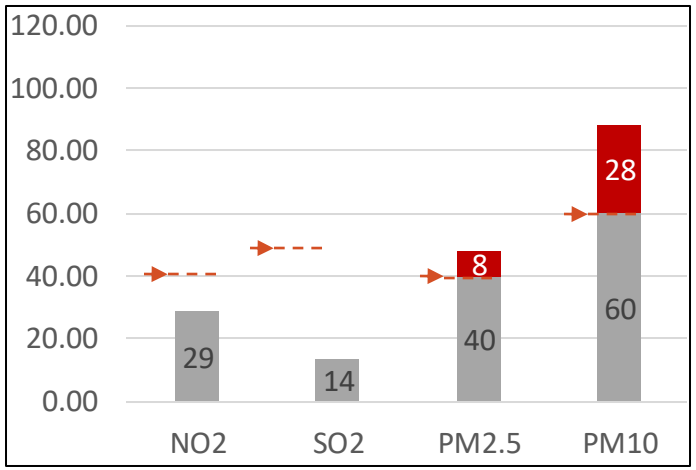


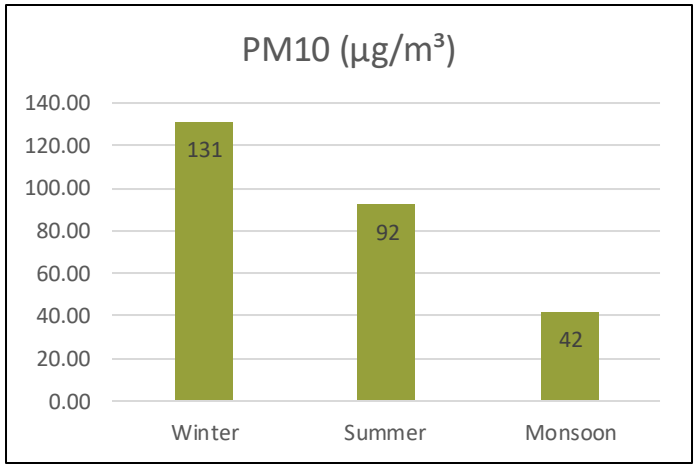
Mahal





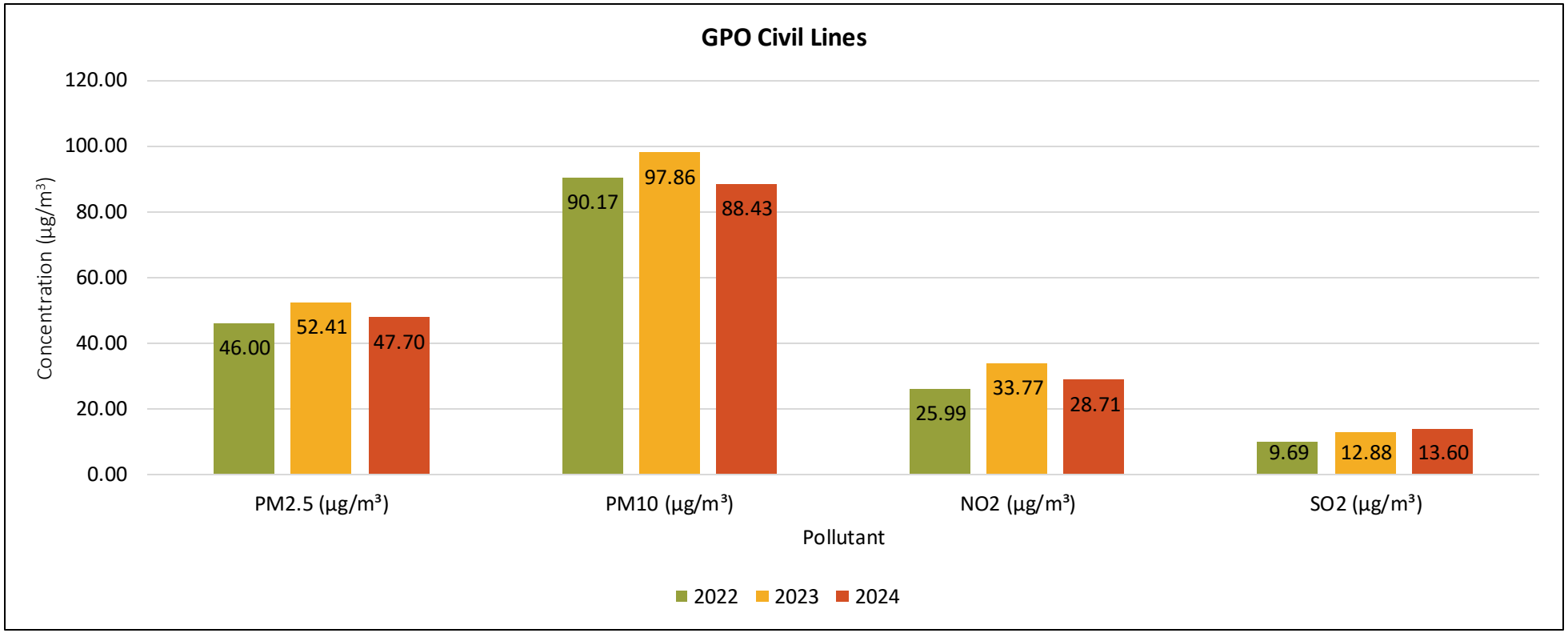
Opp GPO Civil Lines





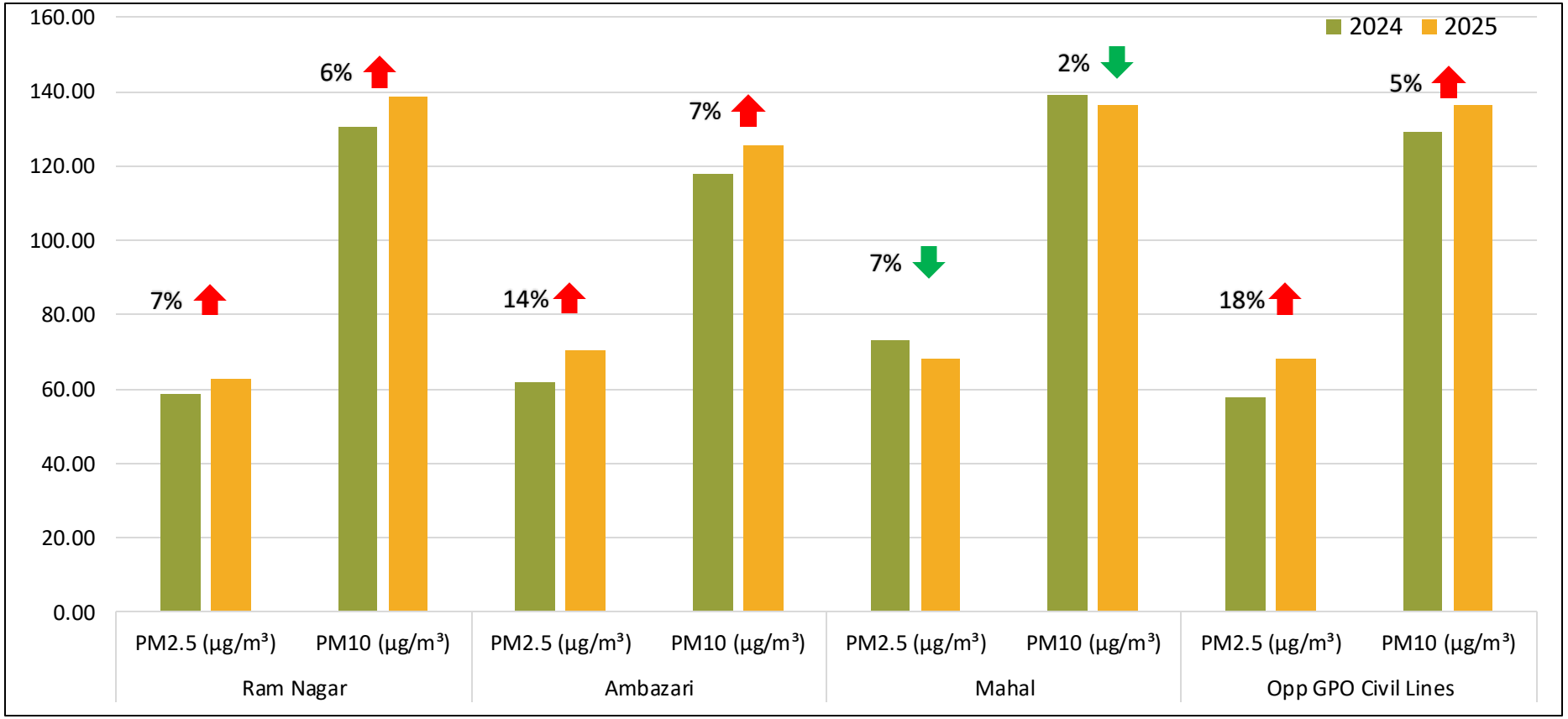
Annual Comparison – GPO Civil Lines

Average pollutant concentration **2022 vs 2023 vs 2024** (µg/m^3)



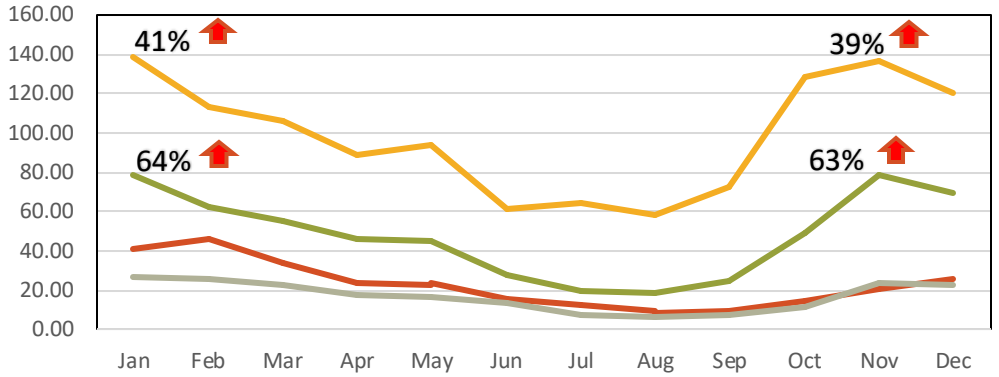
Winter Season Comparison (Jan - Feb)

Average Winter pollutant concentration **2024 vs 2025**(µg/m³)

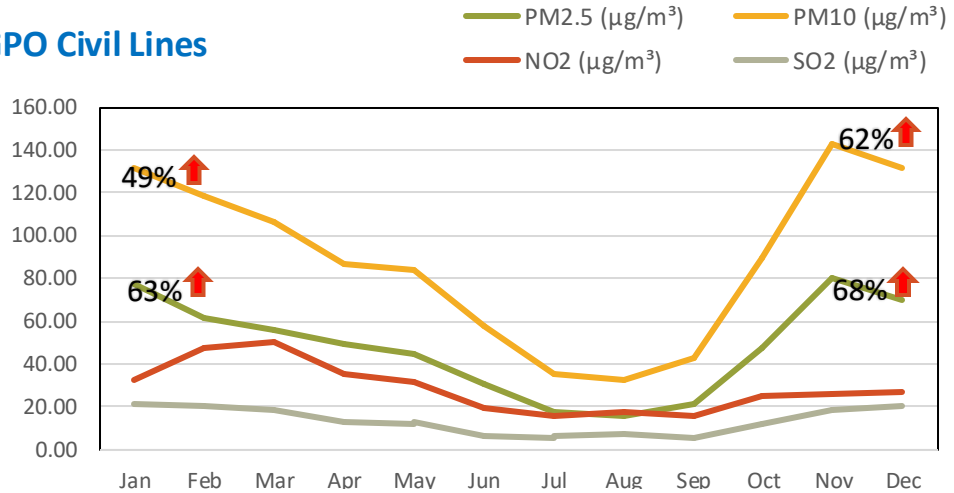


Monthly Average Trends – Station Wise

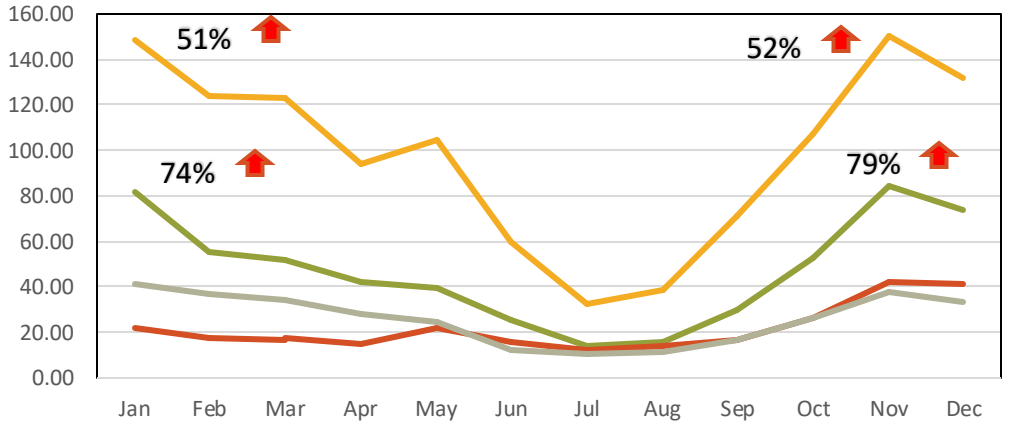
Ambazari



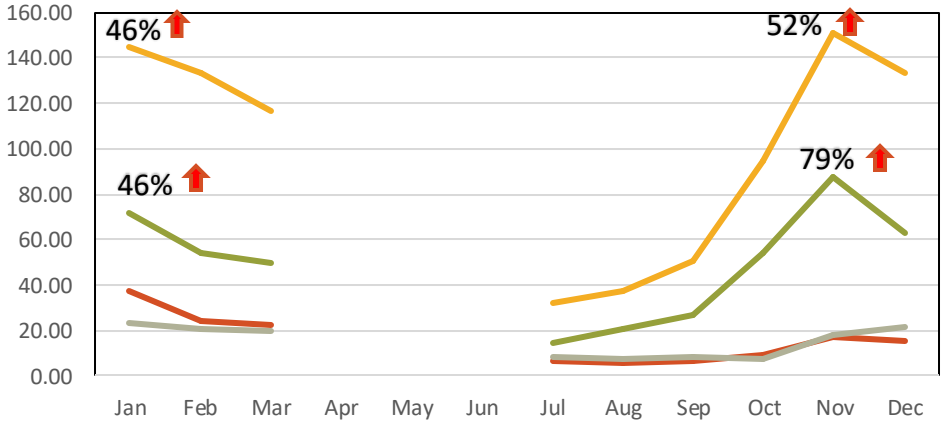
GPO Civil Lines



Mahal Nagar



Ram Nagar



PM10

Jan – 41 to 51%

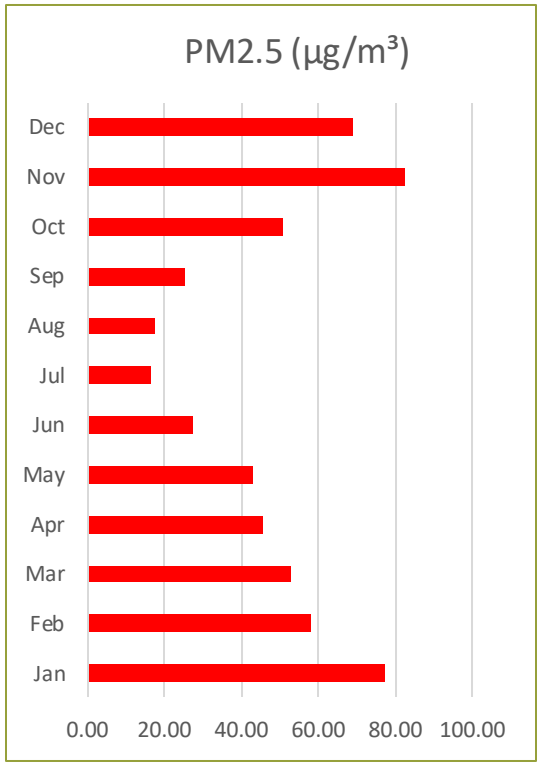
Nov – 39 to 62%

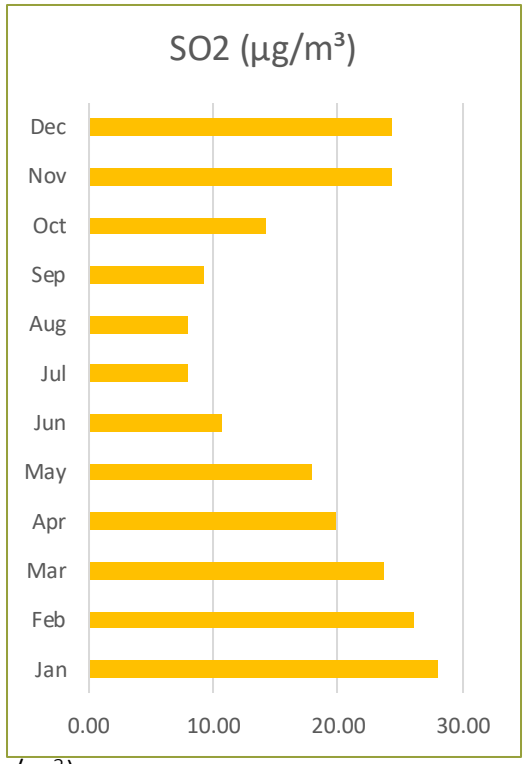
PM2.5

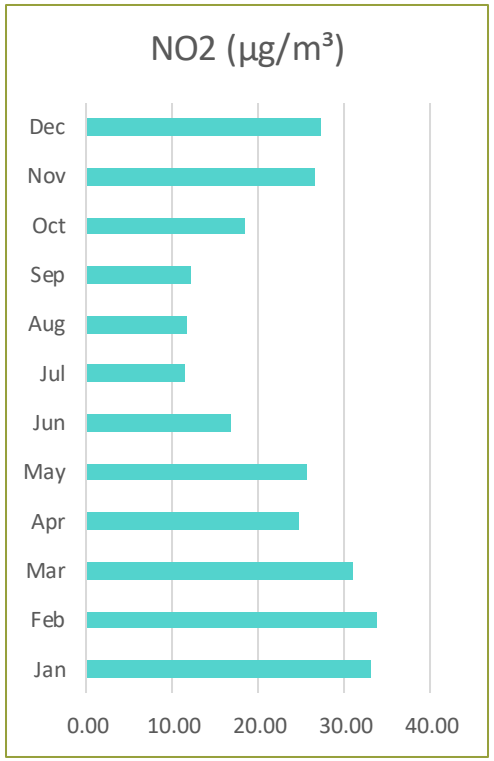
Jan – 46 to 74%

Nov – 63 to 79%

Monthly Trends (2024) – Pollutant wise







Concentration (µg/m³)

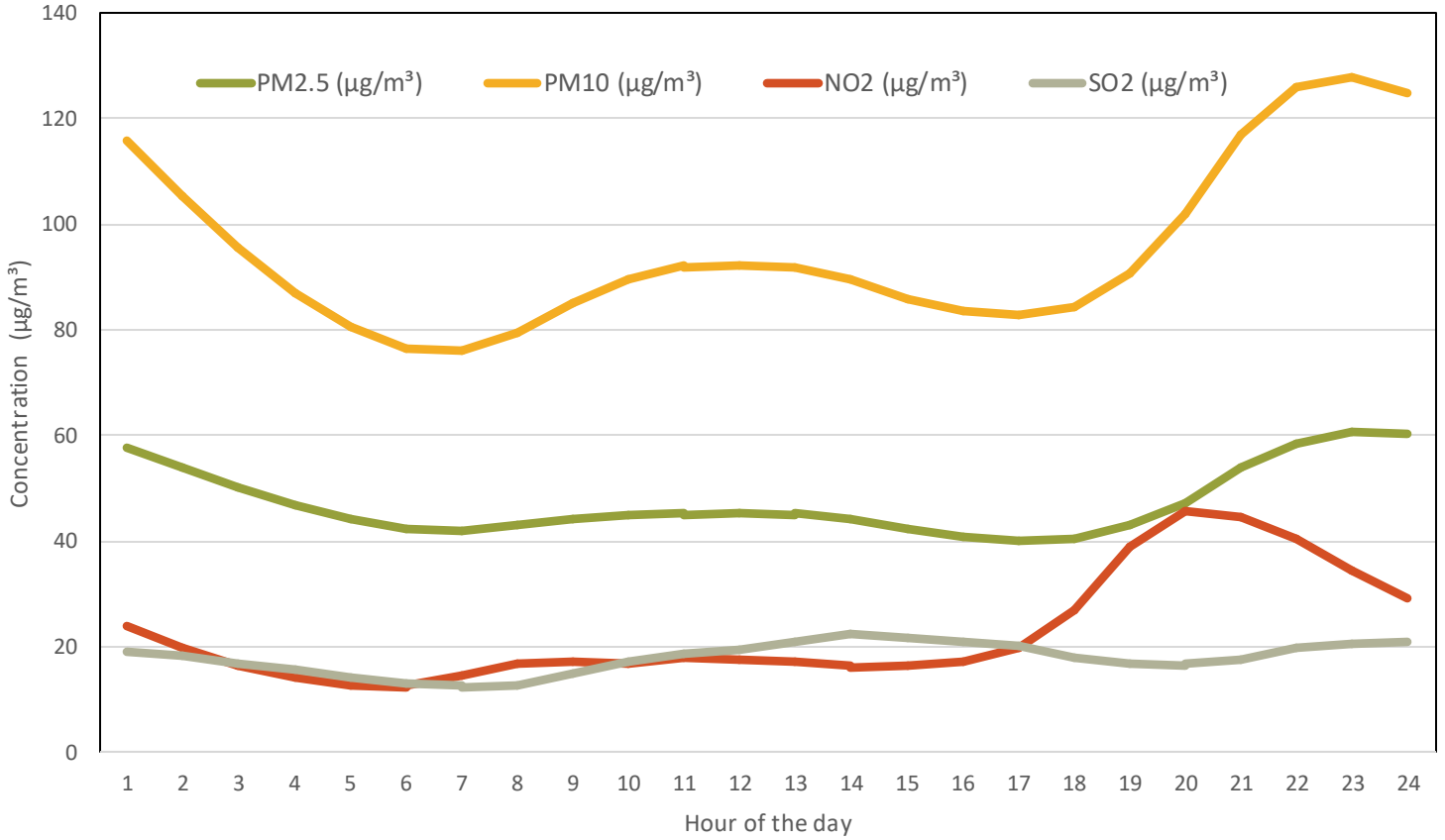
Winter months (November – February) experience highest PM10 and PM2.5 concentration

Average winter concentration was observed to be around **134 µg/m³ for PM10 and 72 µg/m³ for PM2.5**

During the monsoon season, PM2.5 levels **dropped** by **56%** compared to the annual average concentration

Winter season saw PM2.5 **increased by 34 %** compared to the annual average concentration

Hourly Trends



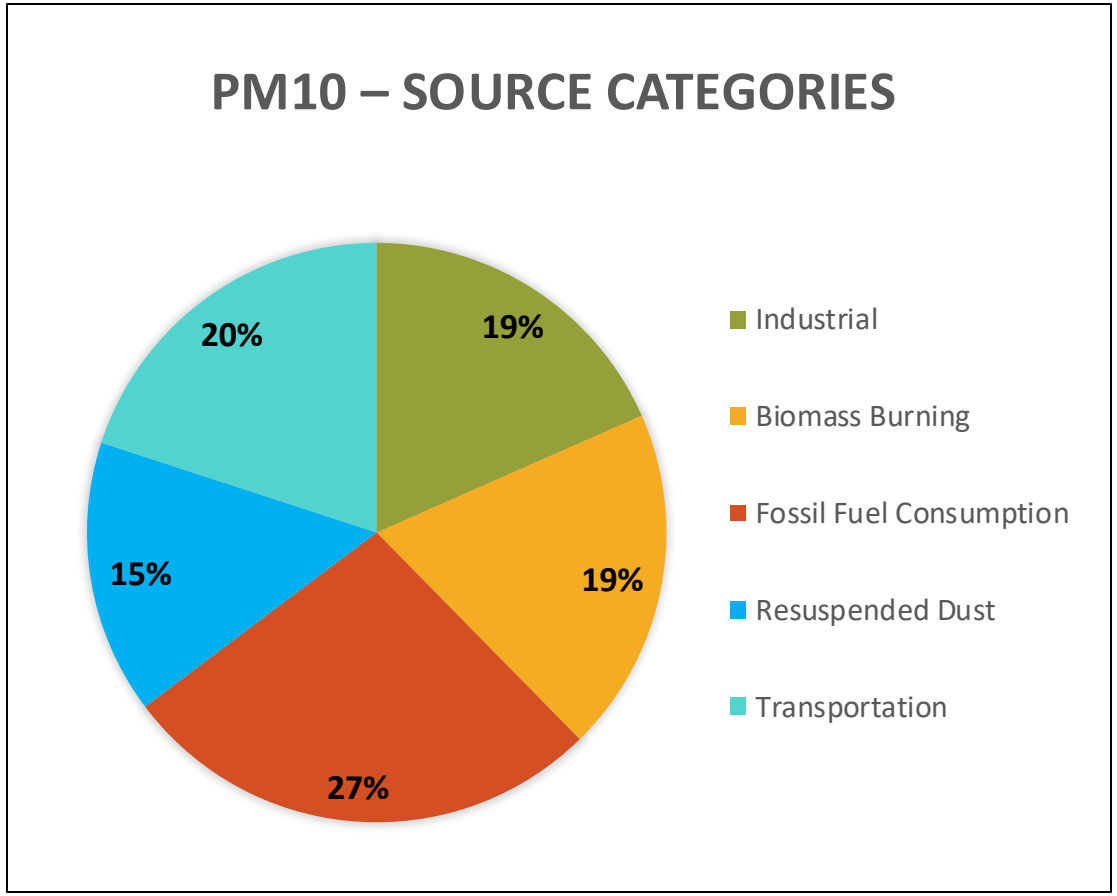
Data shows sharp peak in PM2.5 and PM10 concentrations in the late evening between **9 PM to 1AM**.

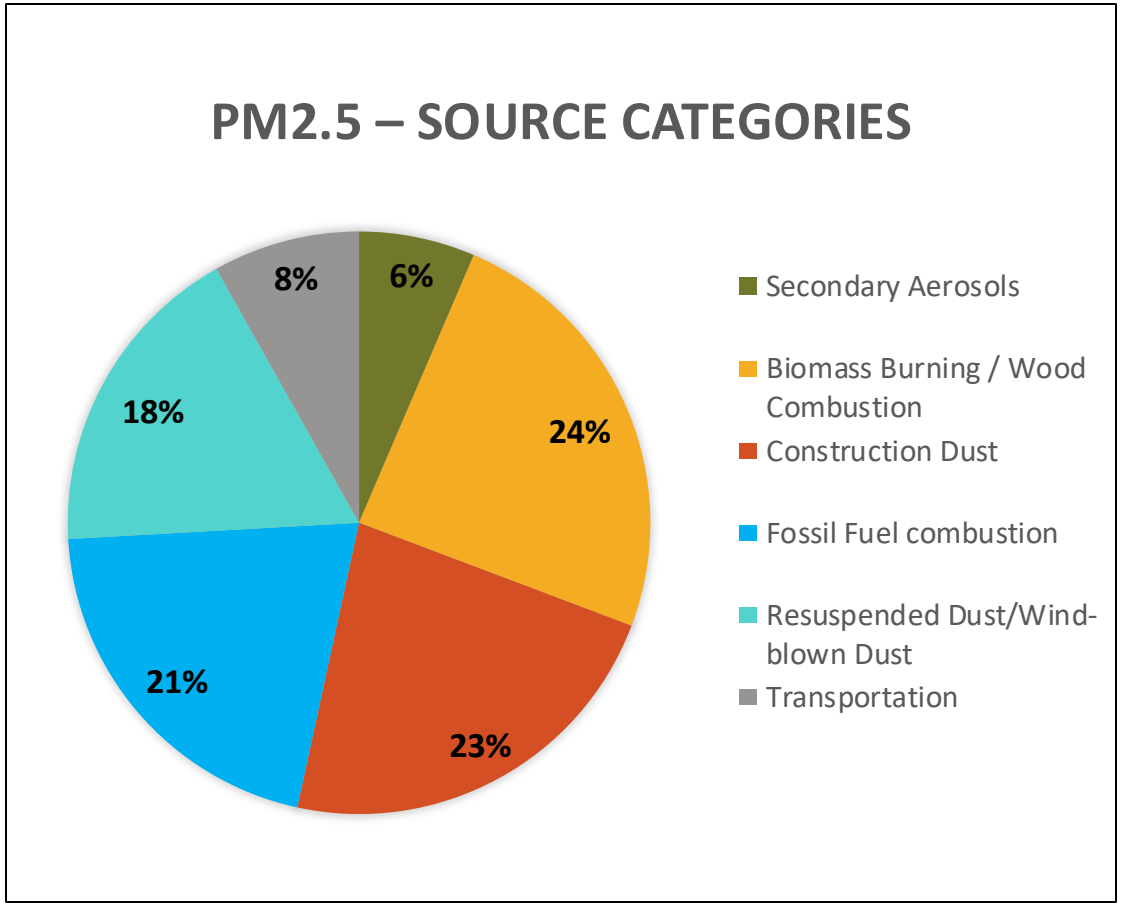
Morning peaks are not observed for both PM2.5 and PM10, however, slight increase around **10AM to 1PM** is observed

SO_2 levels stay low through most of the day.

NO_2 stays low for most of the day but rises noticeably **between 6 PM and 8 PM, indicating vehicular movement**

Particulate Matter - Source Categories



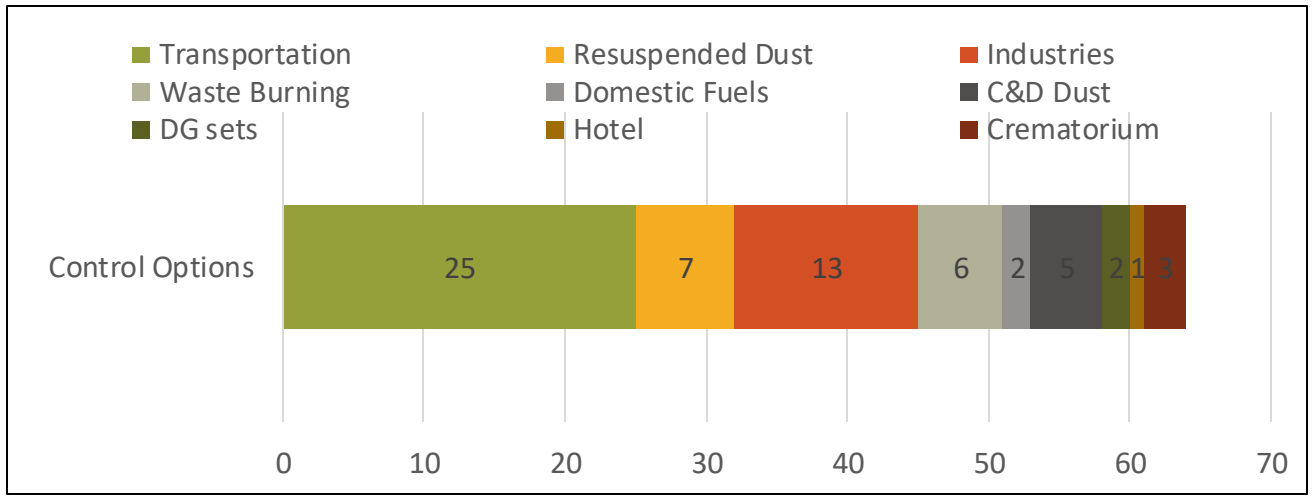


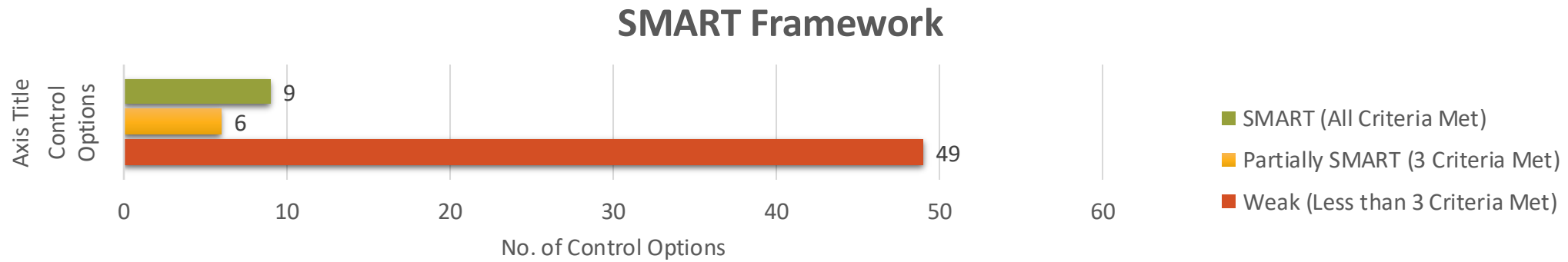
Source: IIT Bombay. (2022). *Air quality monitoring, emission inventory and source apportionment studies for ten cities in the state of Maharashtra.*

SMART Analysis – Nagpur CAAP

SMART FRAMEWORK

- Specific – Goals must be Clear, unambiguous, and focused
- Measurable – Quantifiable criteria to track progress
- Actionable/Achievable - Realistic Given city/state resources and context
- Related – Addresses dominant emission sources
- Timebound has set timeline or deadlines





Key Highlights

- **Monitoring station coverage:** Focused on the western part of the city
- **Data Availability:** CAAQMS data is available only from 2023 onward; only GPO Civil Lines provides usable data starting from 2022. Unavailability of data limits historical data annual comparison
- **Pollution Levels:** In 2024, average PM10 levels across stations ranged from 88 to 98 µg/m³, and PM2.5 levels hovered between 47 and 50 µg/m³, both exceeding the annual NAAQS limits
- Ambazari and Mahal stations showed the highest PM10 concentrations, each close to 98 µg/m³
- PM2.5 and PM10 peaks in the night, between 9 and 11 PM
- Winter concentrations indicate a mild rise in both PM10 and PM2.5
- Only 14% of control measures (9) follow the SMART framework and around 76% are weak in following SMART framework