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Know your city and what you breathe

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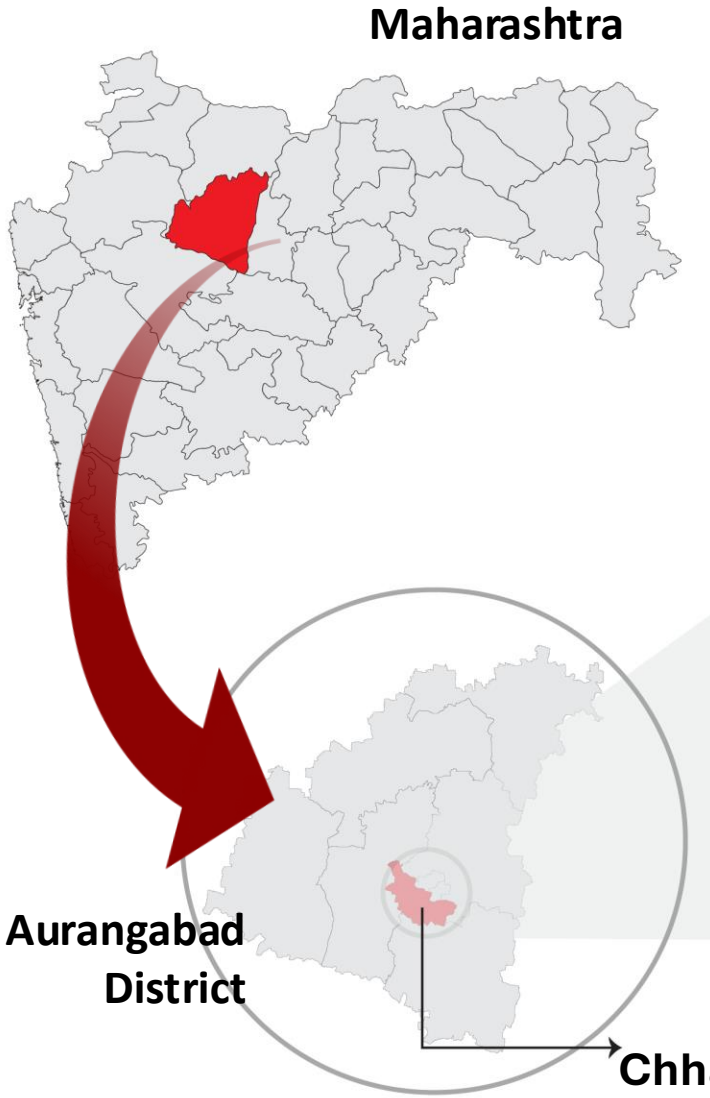
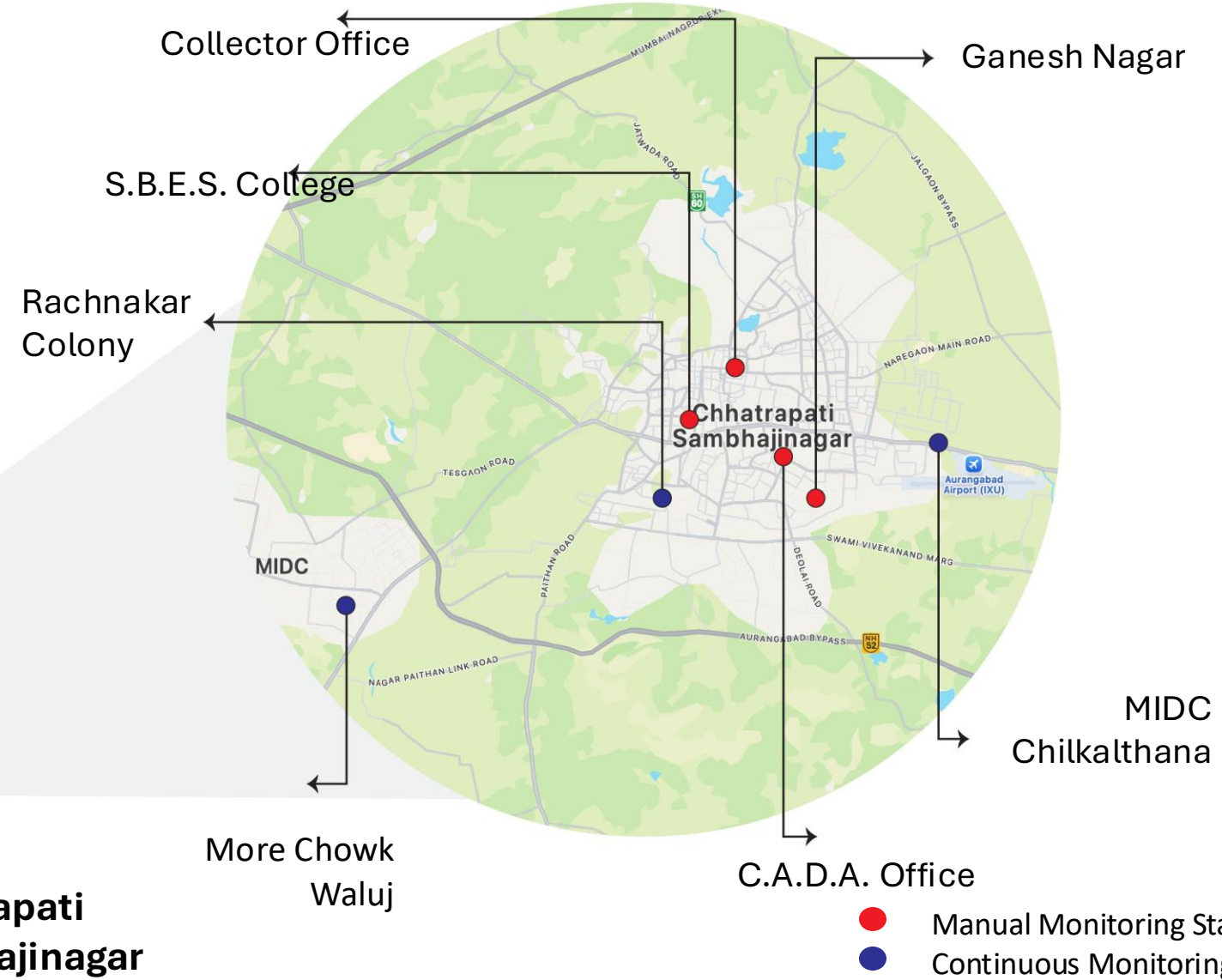
Air Pollution - What it Looks Like?

Source:

1) The Wire
2) Lokmat
3) https://www.aqi.in/in/dashboard/india/maharashtra/

Study Area


Maharashtra
Aurangabad District
Chhatrapati Sambhajinagar


Collector Office
Ganesh Nagar
S.B.E.S. College
Rachnakar Colony
Chhatrapati Sambhajinagar
MIDC
MIDC Chilkalthana
More Chowk Waluj
C.A.D.A. Office
Manual Monitoring Stations
Continuous Monitoring Stations
JATWADA ROAD
JALGAON BYPASS
NAREGAON MAIN ROAD
TESGAON ROAD
PAITHAN ROAD
DEOLAI ROAD
SWAMI VIVEKANAND MARG
AURANGABAD BYPASS
NAGAR PAITHAN LINK ROAD
Aurangabad Airport (IXU)

Contd.

City Demographics

141 KM²

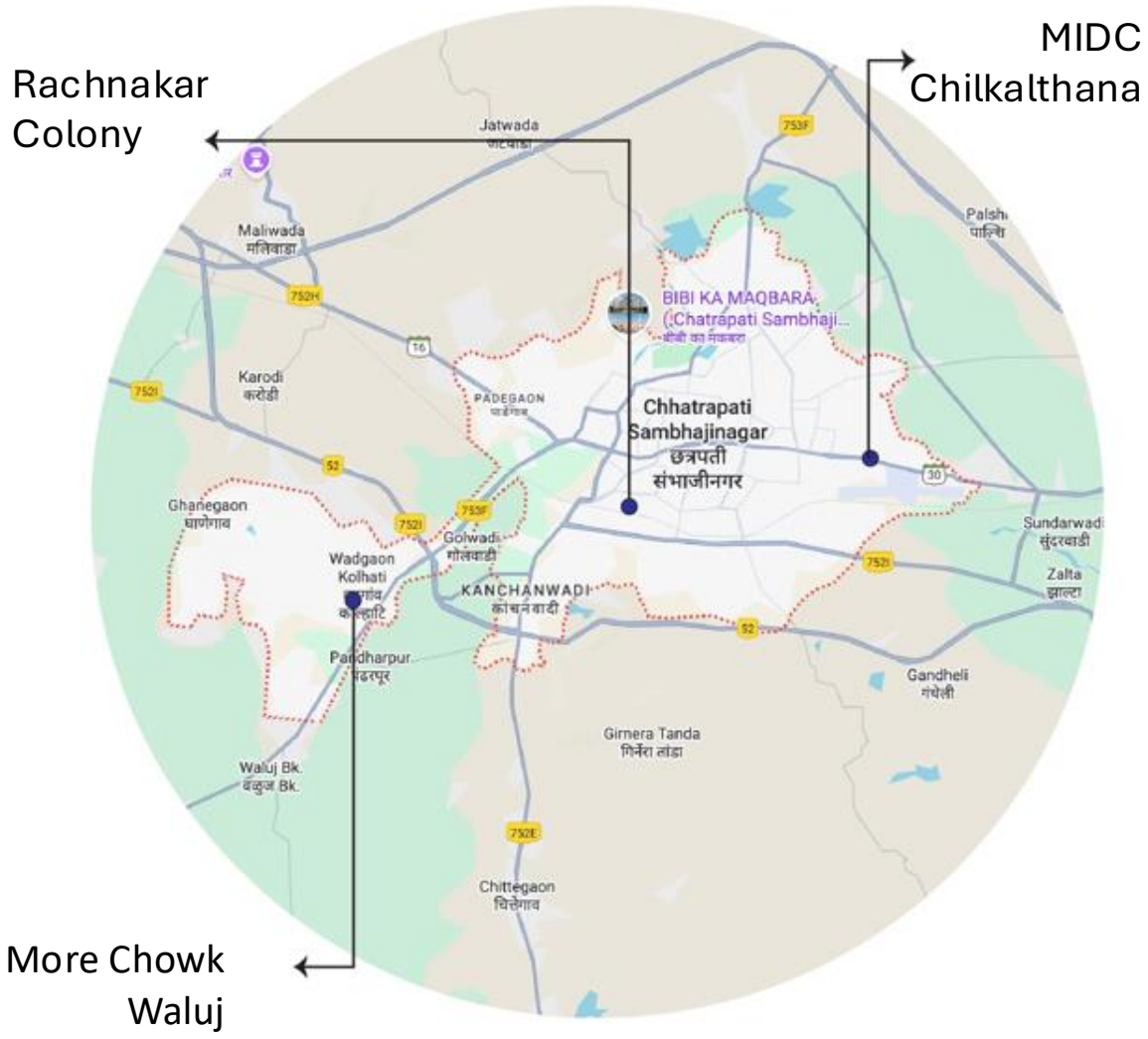
Total Area

17.17 Lakhs

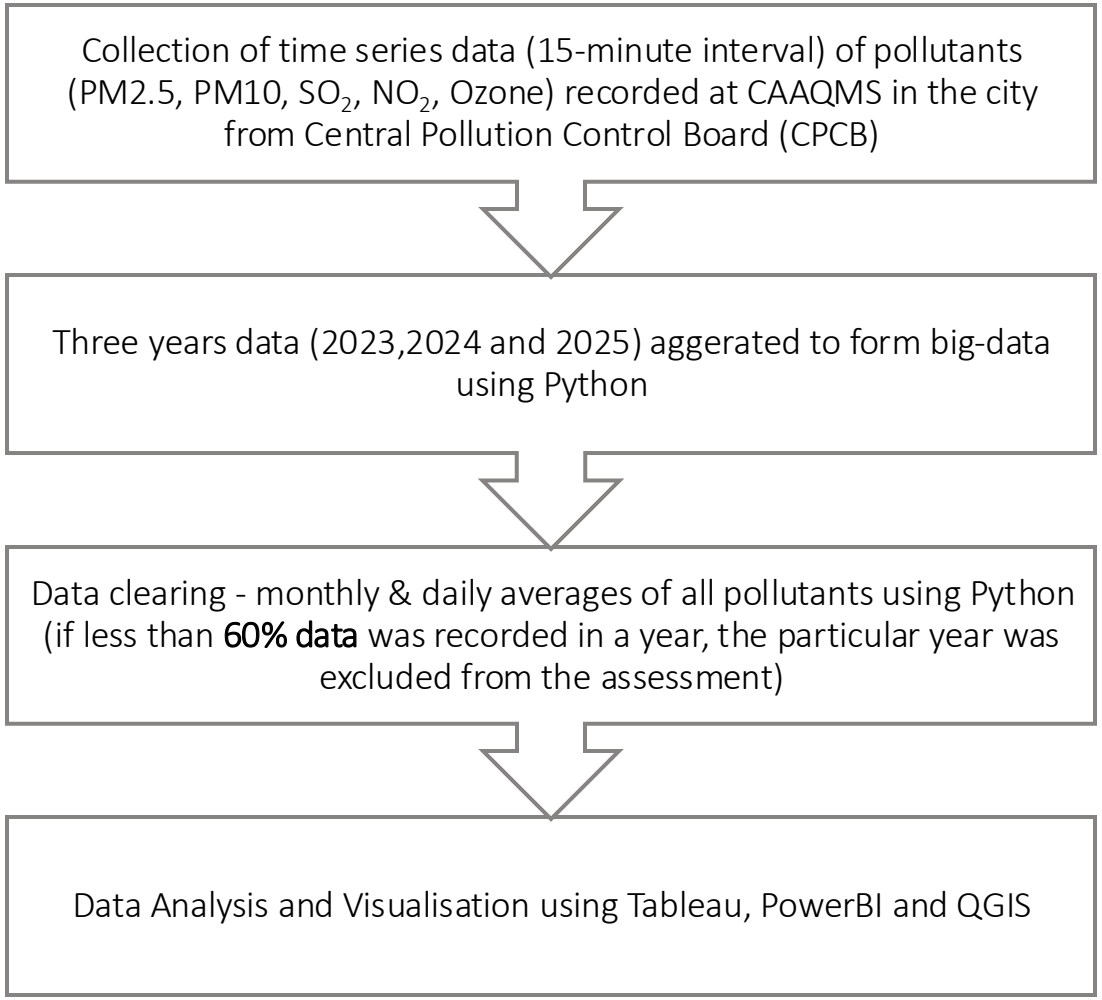
Total Population

Required no of stations

	CAAQMS	Manual	Total
Available	3	4	11
Required	5	3	8



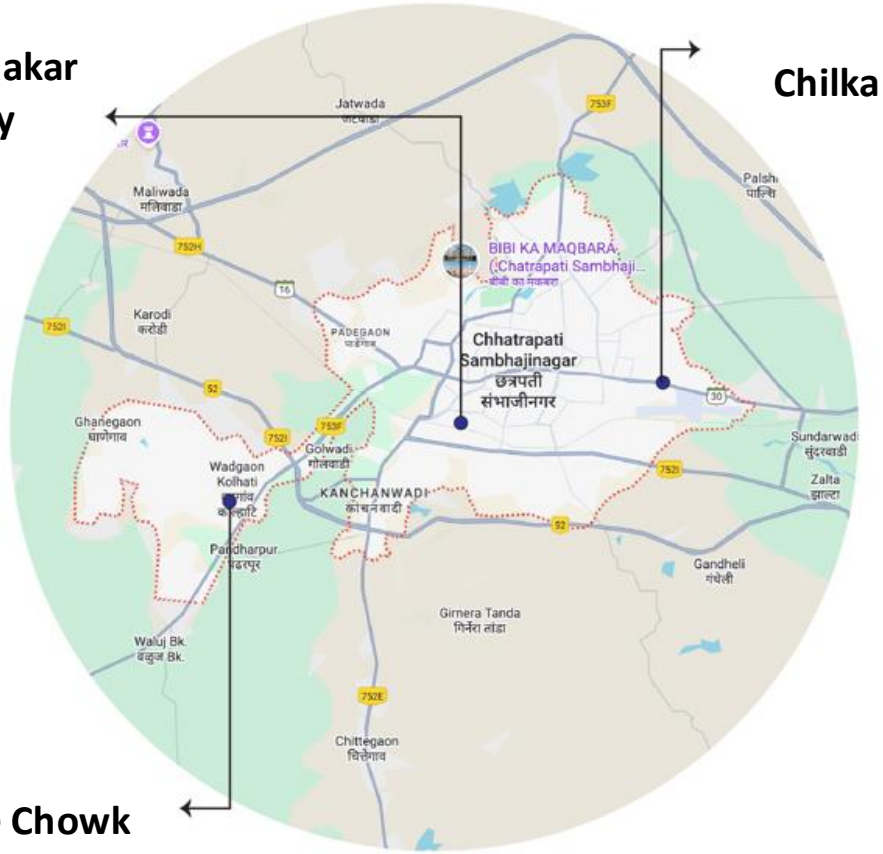
Approach - Data Cleaning



Results – Annual Average 2025

PM10 - 78 µg/m³
PM2.5 - 38 µg/m³

Rachnakar Colony



MIDC Chilkalthana

PM10 - 76 µg/m³
PM2.5 - 34 µg/m³

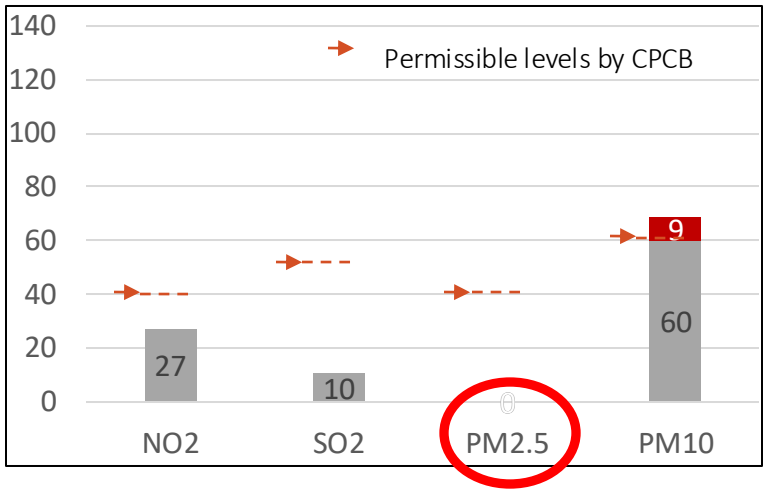
PM10 - 62 µg/m³
PM2.5 - NA

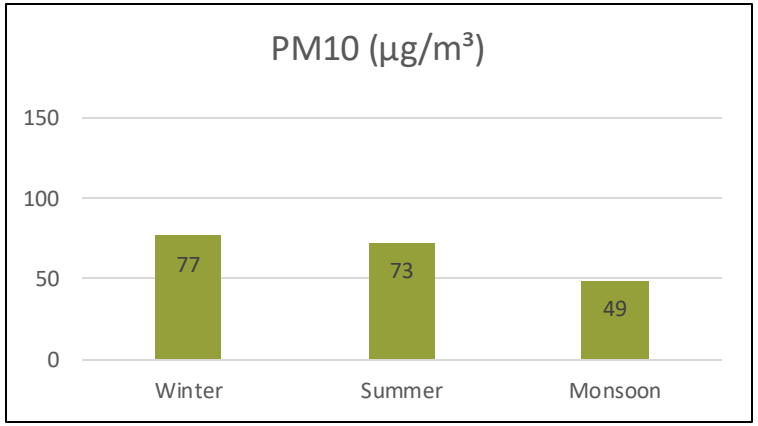
More Chowk Waluj

Annual Avg Concentration (2024)

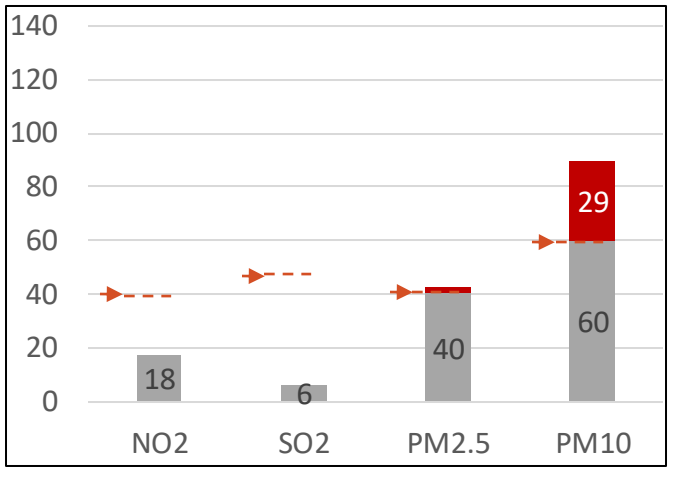
Pollutant concentration 2024 (µg/m³)

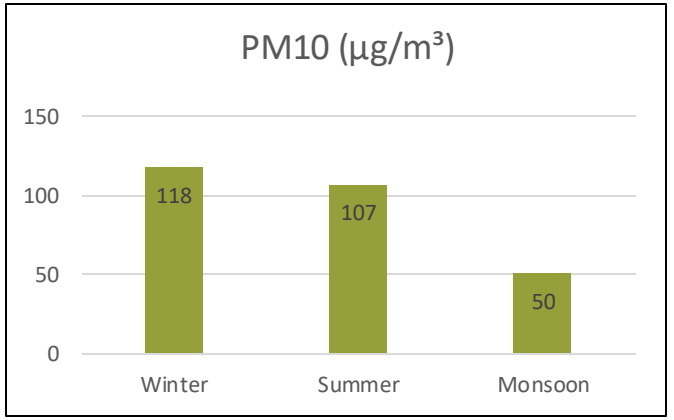
More_Chowk_Waluj



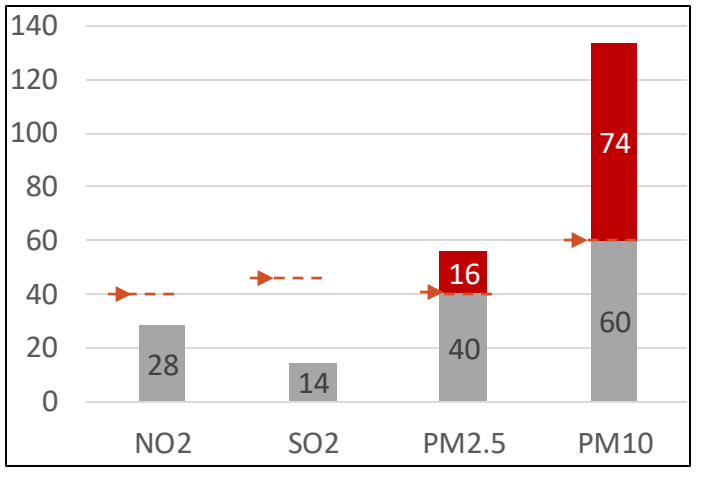


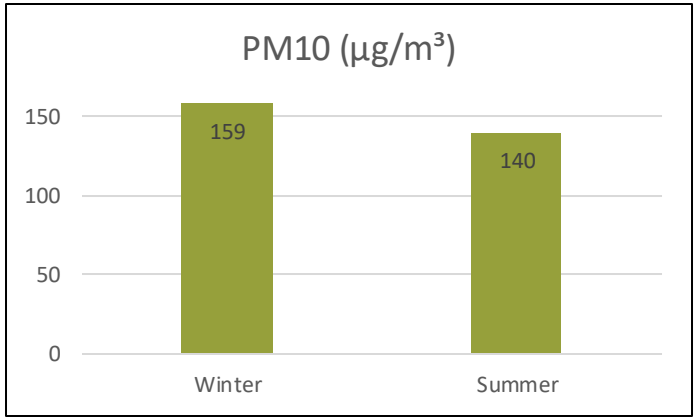
MIDC_Chilkalthana





Rachnakar_Colony

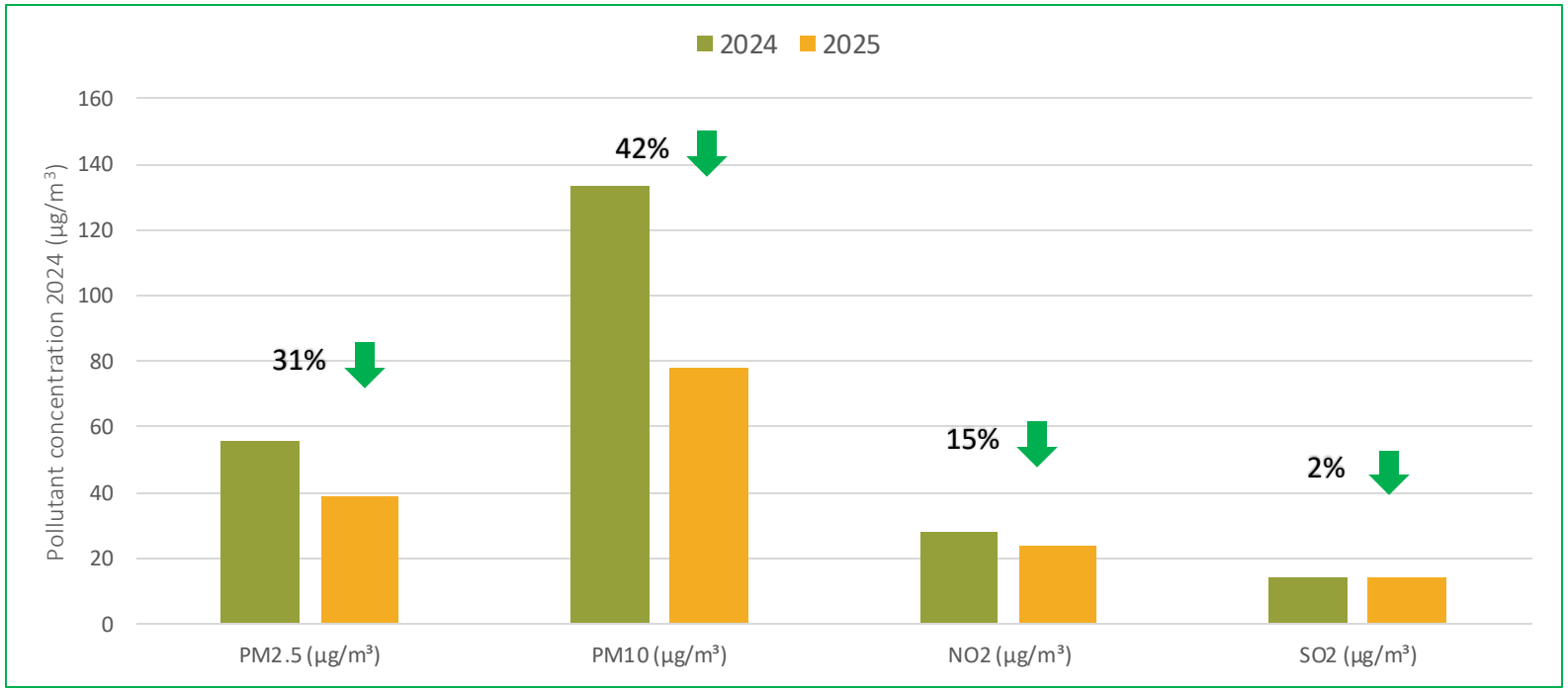




Yearly Annual Comparison

Rachnakar Colony

Particulate Matter pollutant concentration **2024 vs 2025** (µg/m^3)

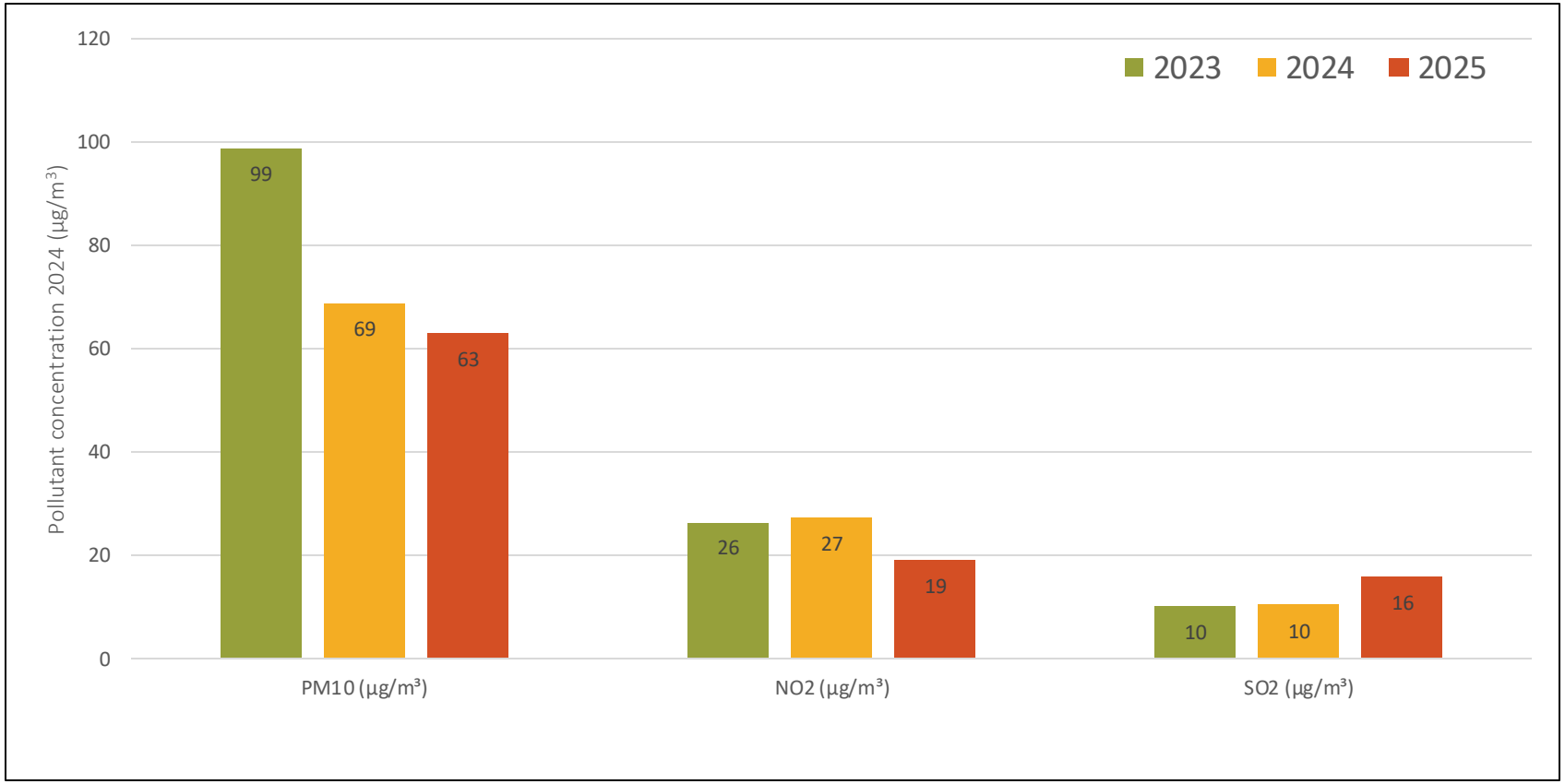


Sufficient data was not captured at the station for June, July, and August 2024

Contd.

More Chowk Waluj

Average pollutant concentration **2023 vs 2024 vs 2025** (µg/m^3)



PM10 levels dropped in 2025 compared to 2023. The decline is substantial, about 36 % lower than 2023

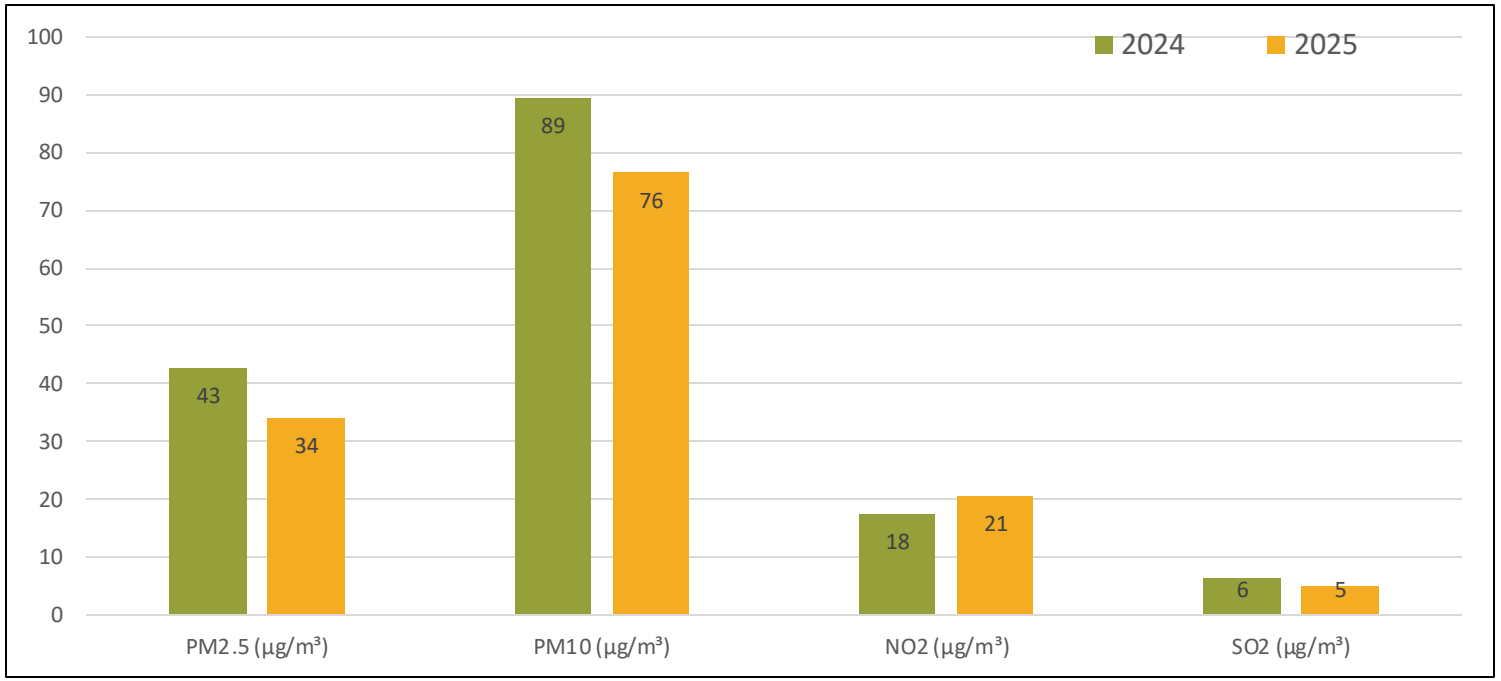
50% Increase in SO_2 values and **28% decrease** in NO2 values in 2025 compared to both 2023 and 2024

PM2.5 values for 2024 and 2025 are not captured
2025 doesn't include the December value, and 2024 is missing the January value

Contd.

MIDC Chilkalthana

Average pollutant concentration **2024 vs 2025** (µg/m^3)

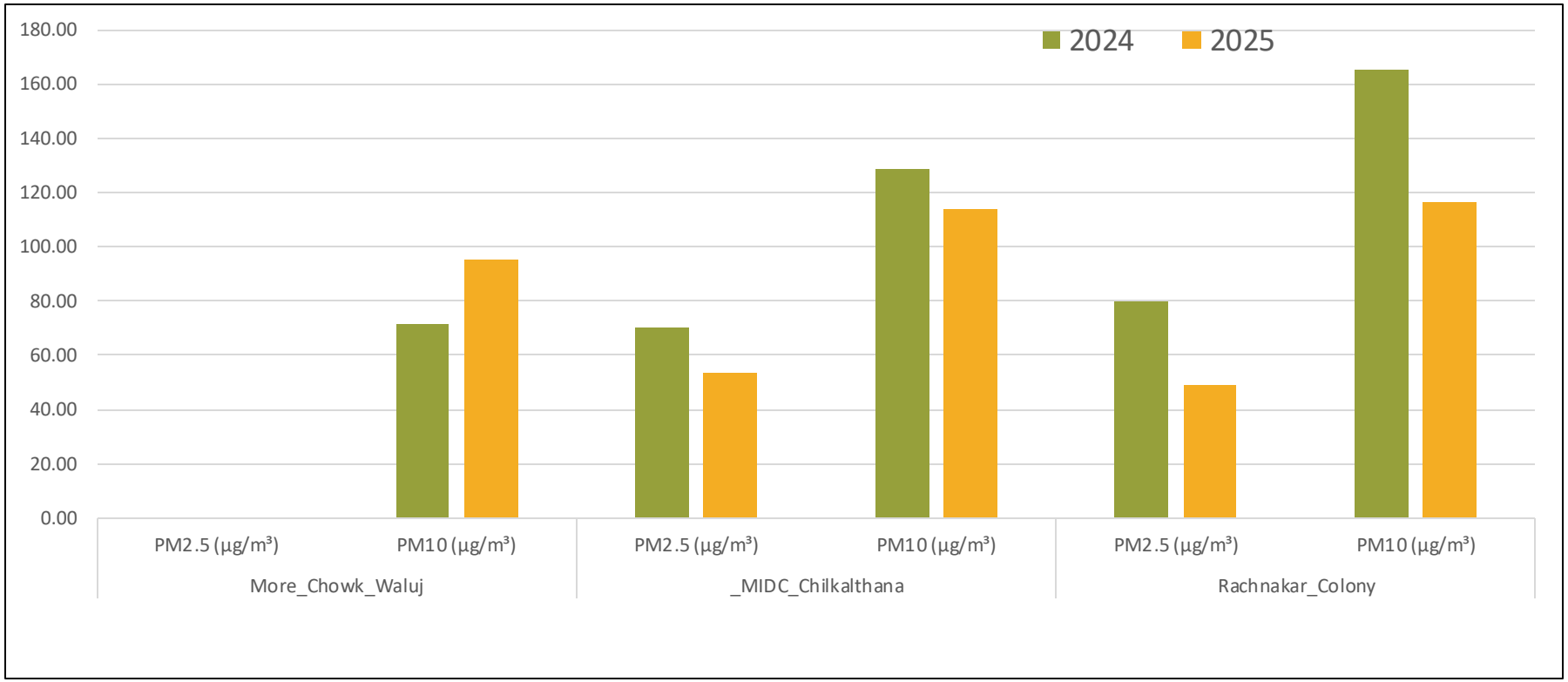


Decrease in annual PM2.5 and PM10 values for 2025 compared to 2024 by **20% and 14%**respectively, indicating improvement in particulate levels.

Increase in NO_2 values in 2025 compared to 2024 **by 18%.** This can be attribute to vehicular pollution **Decrease in SO2** values by **22%** from 2024 to 2025

Winter Season Comparison (Jan - Feb)

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

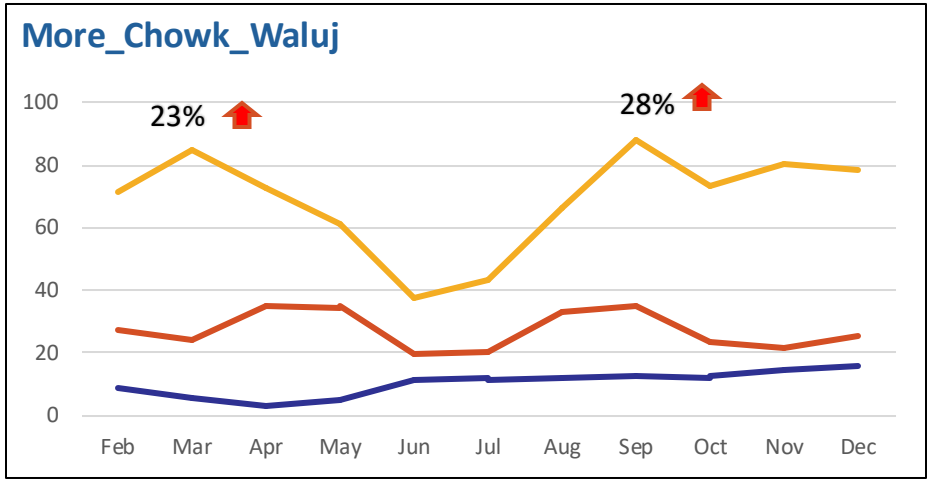


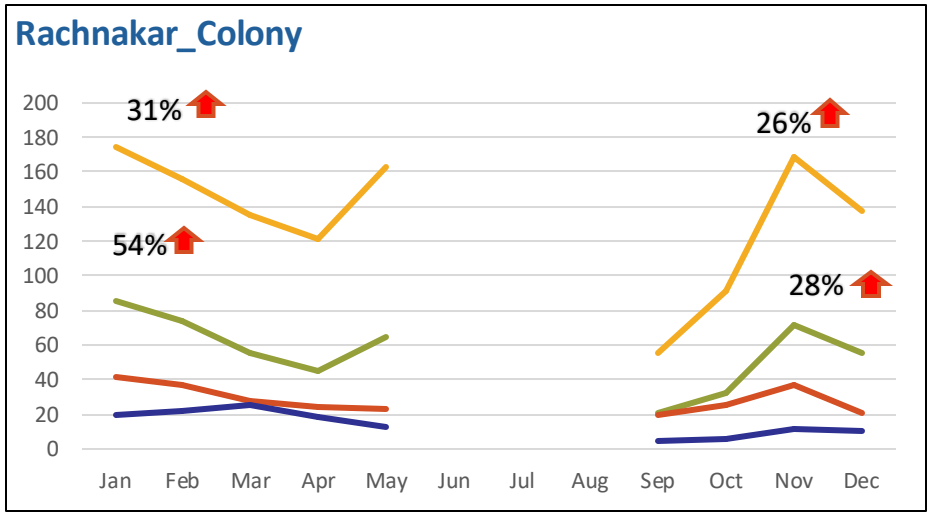
Only More Chowk Waluj stations shows increase in **PM10 (33%)** compared to 2024

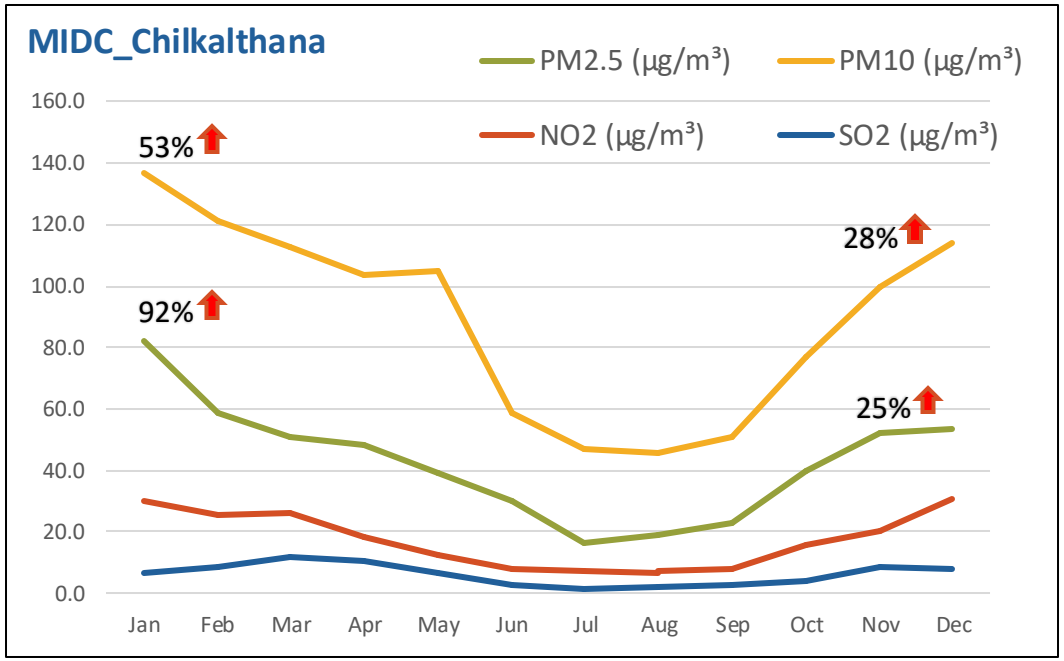
Decrease in both **PM2.5 (31%) and PM10 (13%)** levels for MIDC stations

Rachnakar Colony records the maximum reduction in **PM2.5 (63%) and PM10 (42%)** compared to 2024 among all the stations

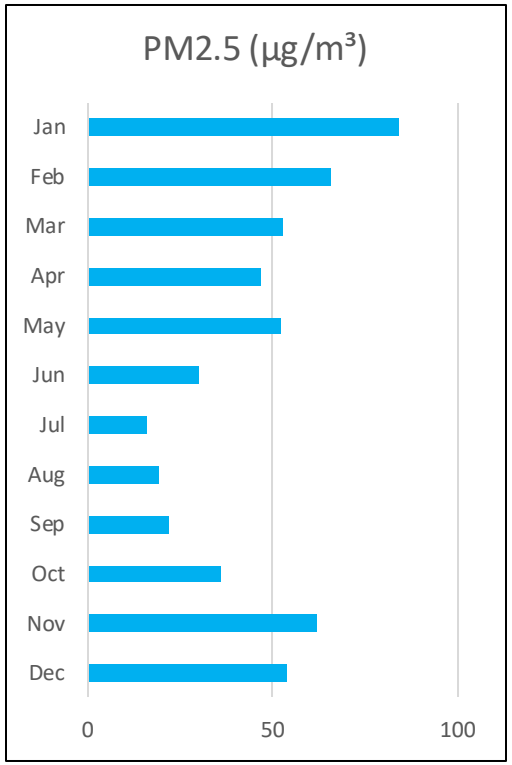
Monthly Average Trends – Station Wise

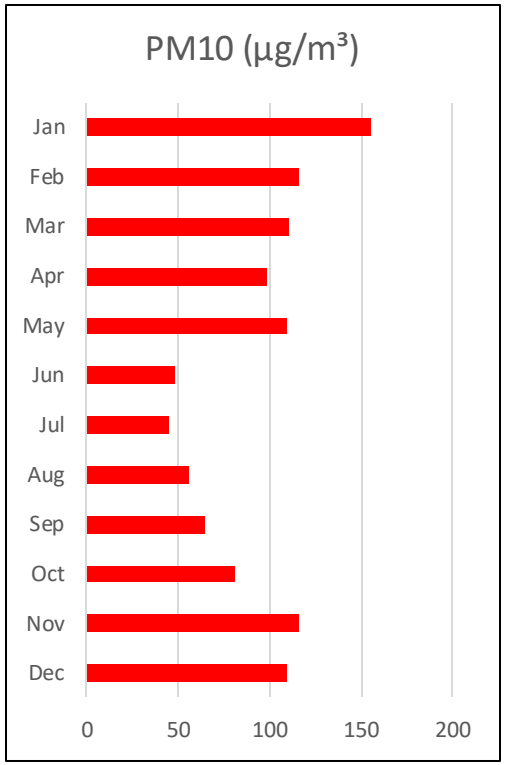


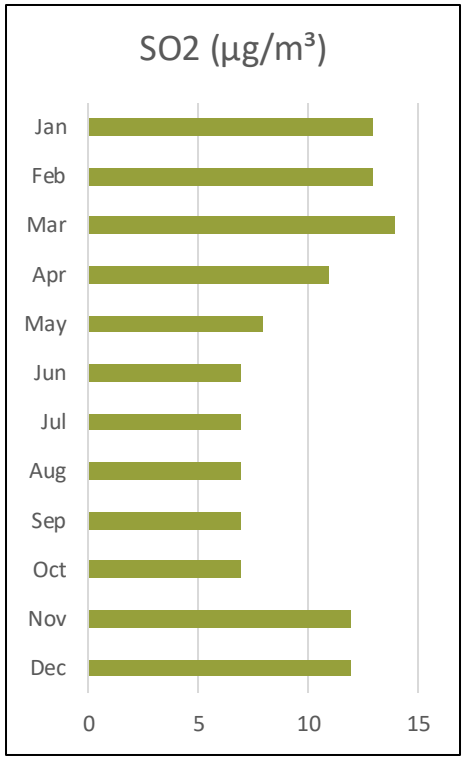


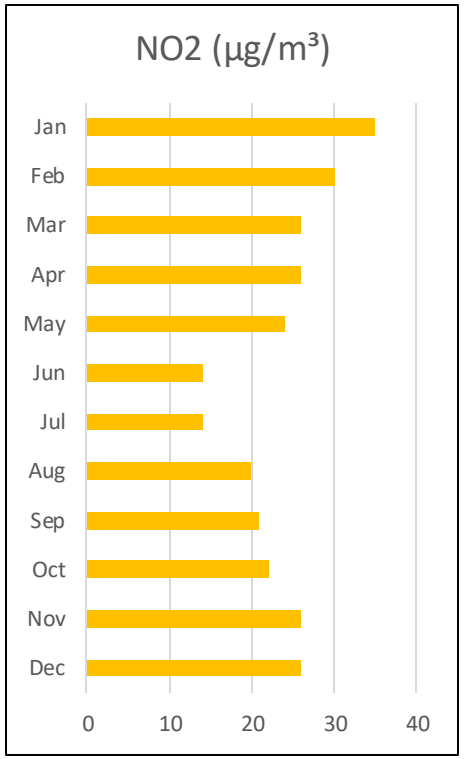


Monthly Trends (2024) – Pollutant wise









Concentration (µg/m³)

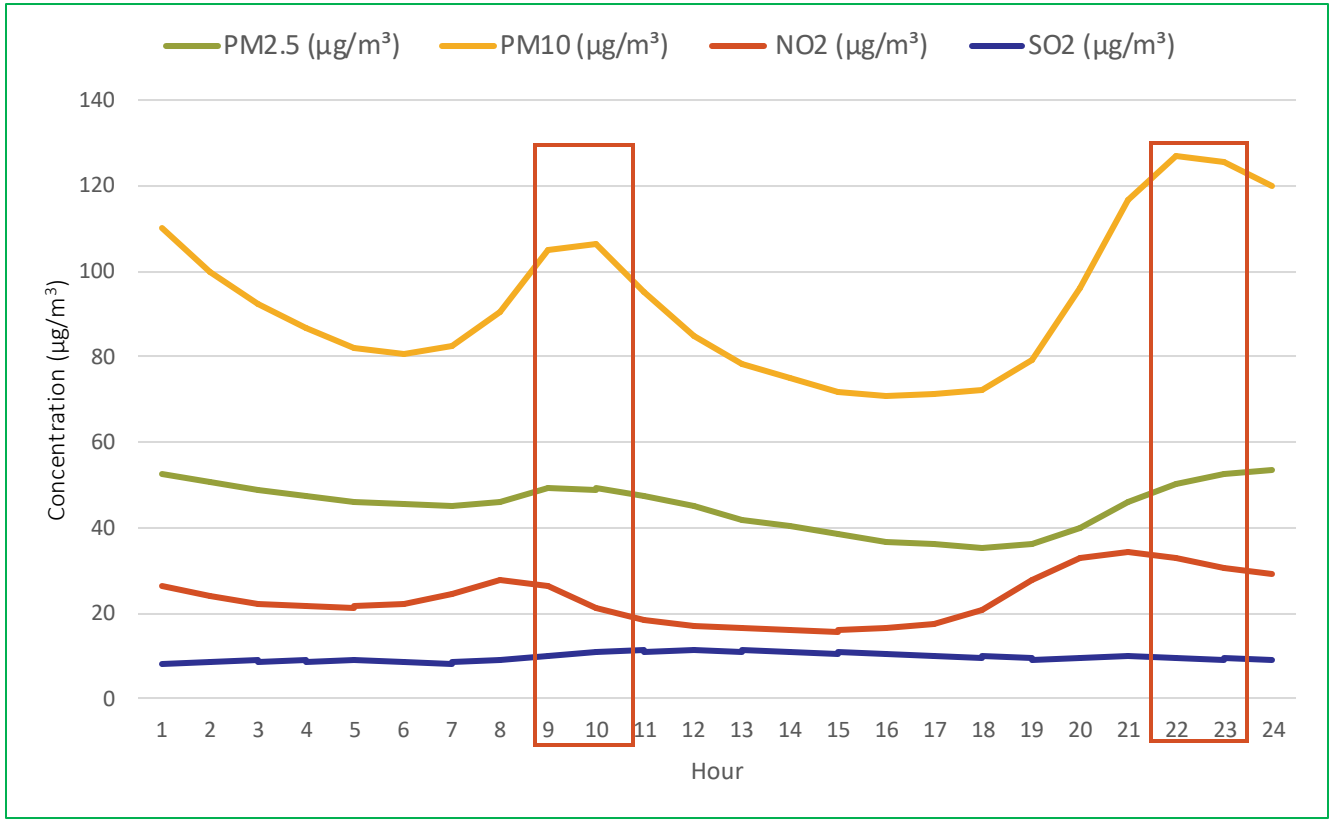
Winter months (November – February) experience highest PM10 and PM2.5 concentration

Average winter concentration was observed to be around **124 µg/m³ for PM10 and 66 µg/m³ for PM2.5**

During the monsoon season, PM2.5 levels **dropped** by **52%** compared to the annual average concentration

Winter season saw PM2.5 **increased by 48 %** compared to the annual average concentration

Hourly Trends



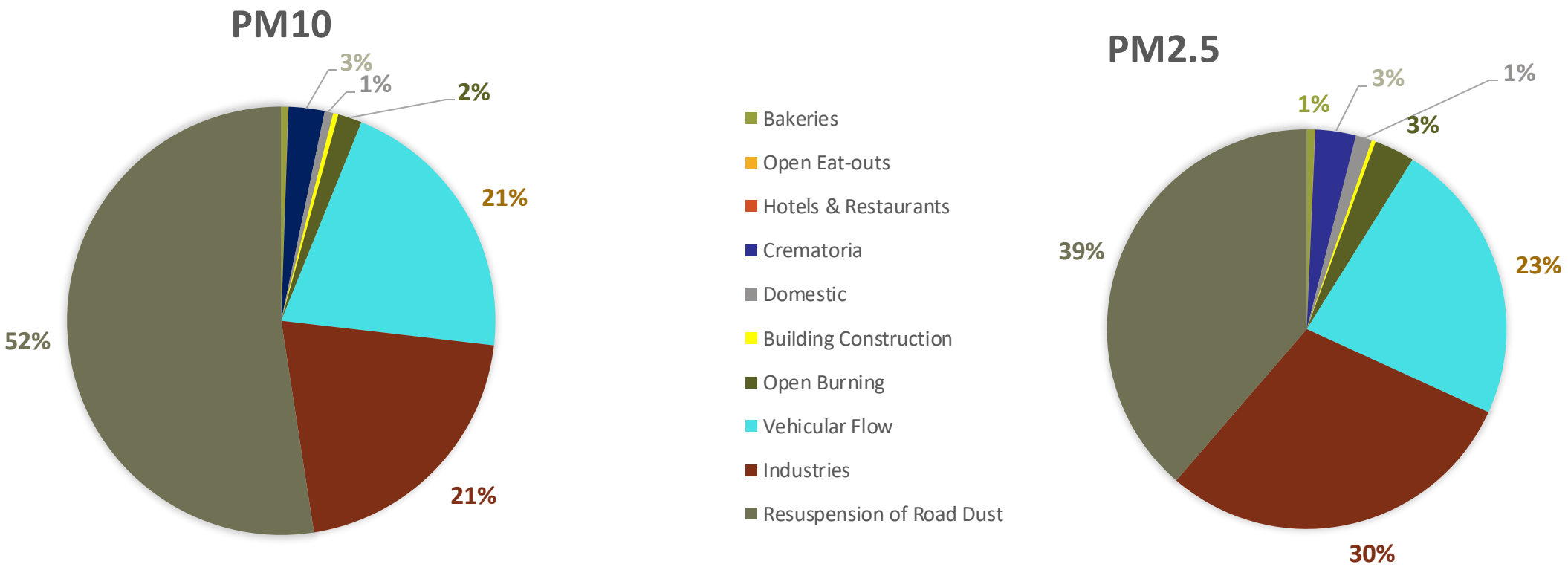
Data shows sharp peak in PM2.5 and PM10 concentrations in the late evening between **10 to 11 PM**.

Morning peaks were observed for PM10 **9 to 10 AM** is observed

SO_2 levels stay low through most of the day.

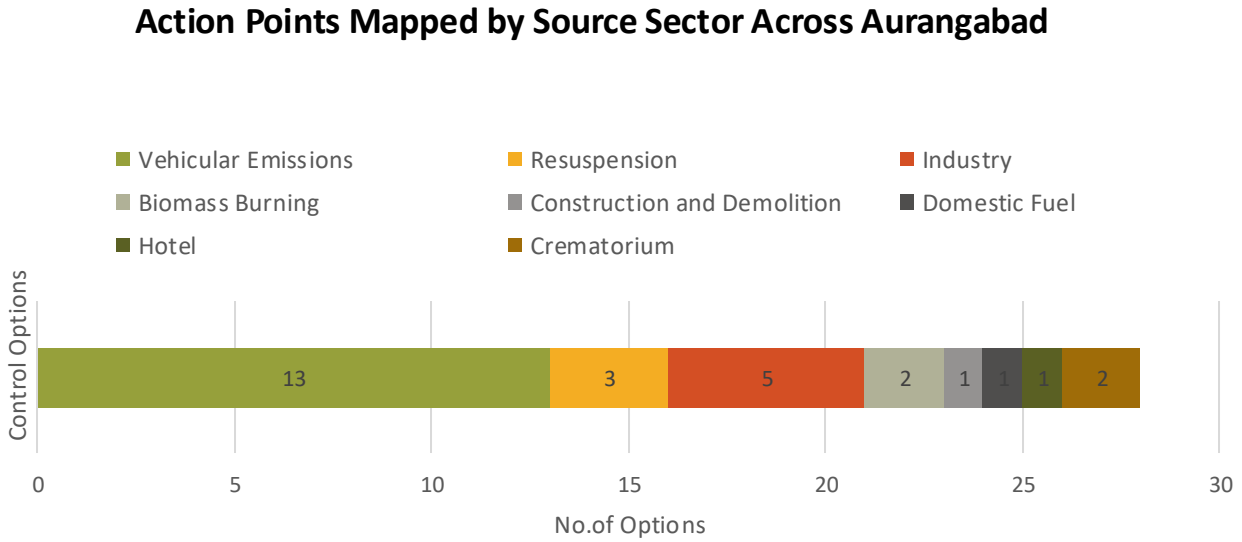
NO_2 stays low for most of the day but rises noticeably **between 6 PM and 8 PM, indicating vehicular movement**

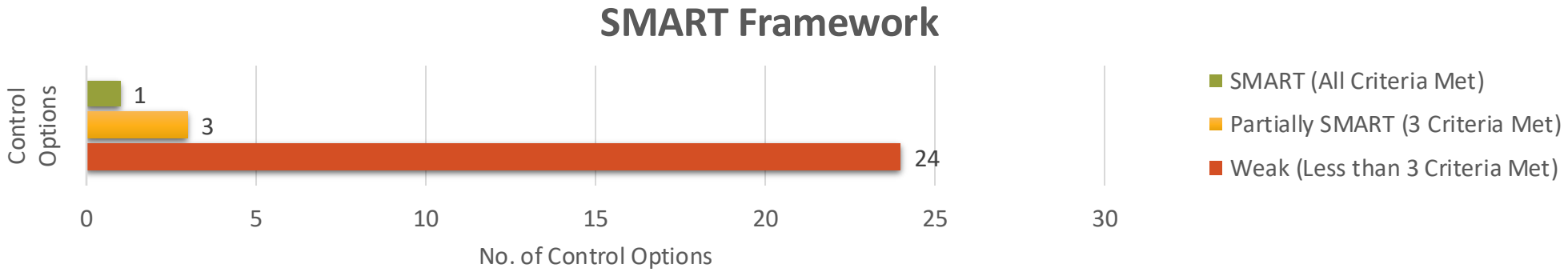
Particulate Matter - Source Categories (EI)



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

SMART Analysis – Aurangabad CAAP





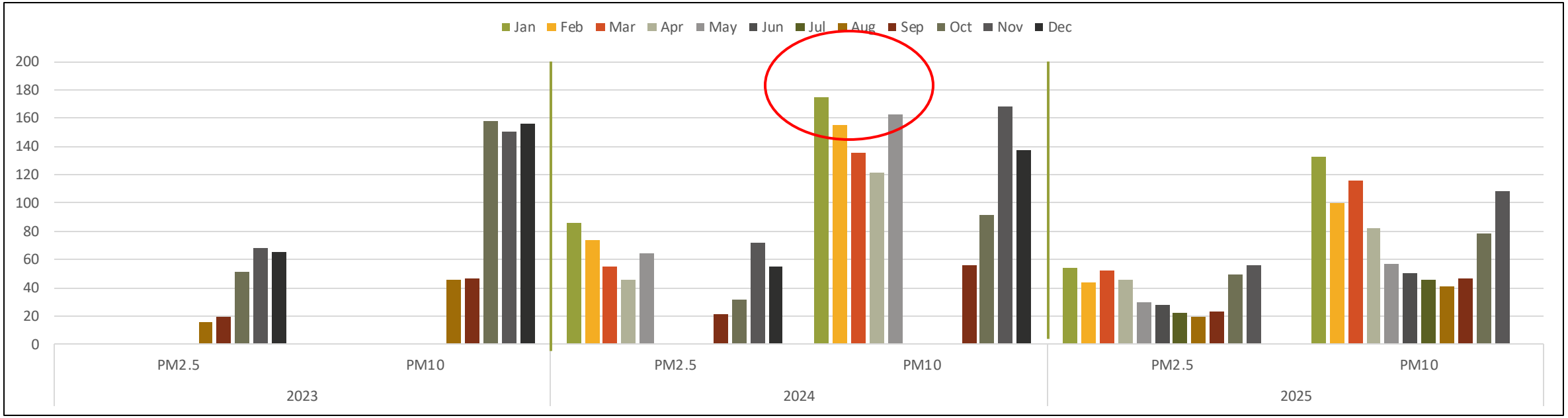
Key Highlights

- **Monitoring station coverage:** Only 3 CAAQMS, No station in the norther part of the city
- **Data Availability: N**otable data gaps such as missing months and absent PM2.5 values in some years. This restricts long-term trend analysis and weakens evidence-based planning.
- **Pollution Levels:** In 2024, average PM10 levels across stations ranged from 68 to 130 µg/m³, and PM2.5 levels stayed between 40 and 60 µg/m³, both above the annual NAAQS limits, showing significant variation across monitoring locations.
- Rachnakar_Colony showed the highest PM10 concentrations, close to 130 µg/m³
- PM2.5 and PM10 peaks in the night, between 10 and 11 PM
- Winter concentrations indicate a mild rise in both PM10 and PM2.5
- Only 17% control measures follow SMART framework (abide by 3 criteria's) and around 83% are weak in following SMART framework

Yearly Annual Comparison

Rachnakar Colony

Particulate Matter pollutant concentration **2023 vs 2024 vs 2025** (µg/m^3)



Sufficient data was not captured at the station for June, July, and August 2024

In **2024**, the highlighted zone shows an exceptionally sharp PM10 spike (around 160–170 µg/m^3), clearly higher than the same period in 2025 and 2023.

Both PM2.5 and PM10 winter values are lower (28%) in 2025 compared with 2024.Summer and monsoon months in 2025 also appear cleaner than the same months in 2024.