Project Introduction

The deteriorating air quality in India has become a pressing public health and economic challenge, with 14 Indian cities ranking among the world's top 20 most polluted urban centers. This crisis has led to an increasing demand for air purification solutions, particularly in regions with persistently poor AQI levels.

Our project, "AirPure Innovations – AQI & Air Purifier Market Analysis", aims to explore the intersection of air pollution severity, health impact, and consumer demand. Leveraging AQI, health, vehicle, and population datasets (2022–2025)

Primary Analysis

1. List the top 5 and bottom 5 areas with highest average AQI. (Consider areas which contains data from last 6 months: December 2024 to May 2025)

Area with highest Aqi

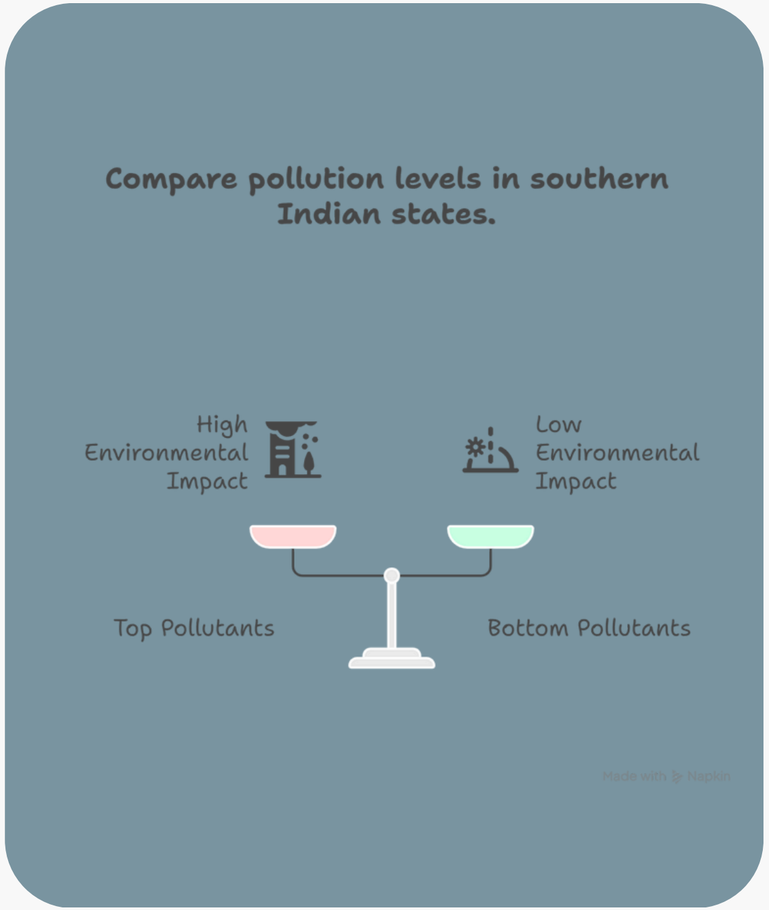
state	area	AverageAqi
Assam	Bymihat	284.19
Delhi	Delhi	238.92
Bihar	Hajipur	233.67
Haryana	Bahadurgarh	226.44
Haryana	Gurugram	204.14

Bottom 5 areas with highest average AQI.

Area with Lowest Aqi

state	area	AverageAqi
Tamil Nadu	Tirunelveli	33.31
Tamil Nadu	Palkalaiperur	42.79
Karnataka	Madikeri	42.95
Karnataka	Vijayapura	44.33
Karnataka	Chamarajanagar	44.81

2.List out top 2 and bottom 2 prominent pollutants for each state of southern India. (Consider data post covid: 2022 onwards)



state	Top2_Pollutants	Bottom2_Pollutants
Kerala	PM2.5, PM10	NH3, SO2
Karnataka	CO, PM10	NH3, SO3
Tamil Nadu	PM2.5, PM10	NO2, NH3
Andhra Pradesh	PM2.5, PM10	NO2, SO2
Telangana	PM2.5, PM10	O3, NO2
Puducherry	O3, PM10	PM2.5, CO

3. Does AQI improve on weekends vs weekdays in Indian metro cities (Delhi, Mumbai, Chennai, Kolkata, Bengaluru, Hyderabad, Ahmedabad, Pune)?

- Improvement: Delhi, Chennai, Kolkata and Pune showan improvement in air quality on weekends, suggesting that reduced industrial activity and vehicular traffic during weekends may contribute to lower pollution levels. Delhi shows the mossive significant improvement.
- Degradation/Negligible Change: Mumbai, Ahmedabad, Bengaluru and Hyderabad show either a slight degradation or negligible change in air quality on weekends. This could be attributed to various factors, such as local meteorological conditions, increased weekend recreational activities involving vehicles, or other localized pollution sources.
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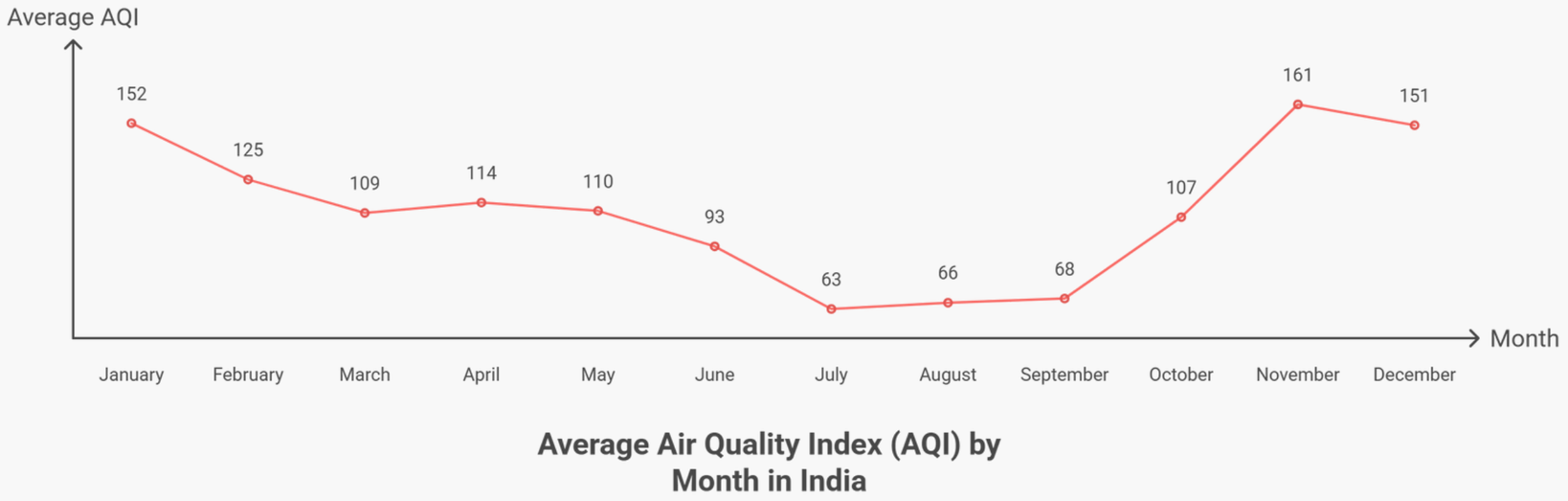
AQI Comparison: Weekdays vs. Weekends in Indian Metro Cities

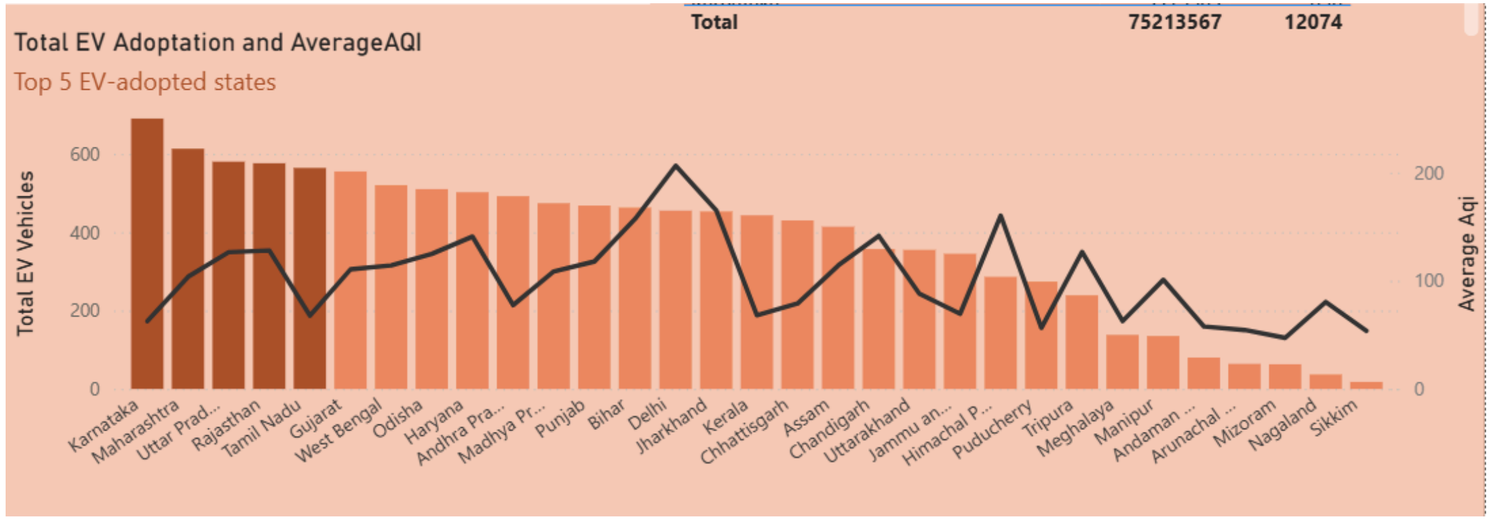
City	Weekday AQI	Weekend AQI
Delhi	234.37	216.54
Mumbai	105.47	107.51
Chennai	73.14	68.27
Kolkata	108.7	108.07
Bengaluru	78.70	78.73
Hyderabad	85.40	85.68
Ahmedabad	122.30	124.74
Pune	116.19	114.27

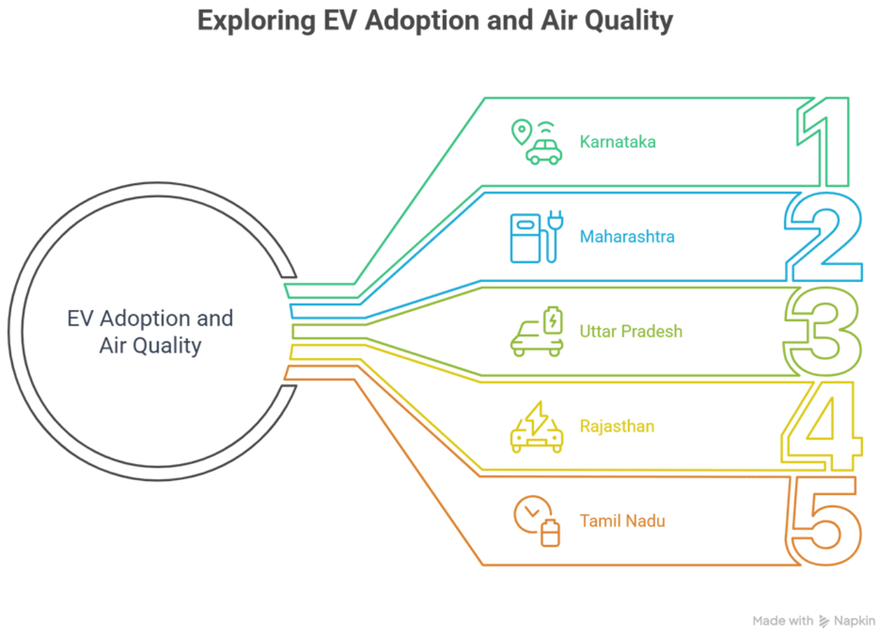
4. Which months consistently show the worst air quality across Indian states — (Consider top 10 states with high distinct areas)



Based on the data, November, January, and December consistently show the worst air quality across Indian states. These months are characterized by high AQI values, primarily due to stubble burning, Diwali celebrations, unfavorable meteorological conditions, and increased vehicle emissions. Conversely, June, July, August, and September generally exhibit the best air quality due to the monsoon season and associated factors.

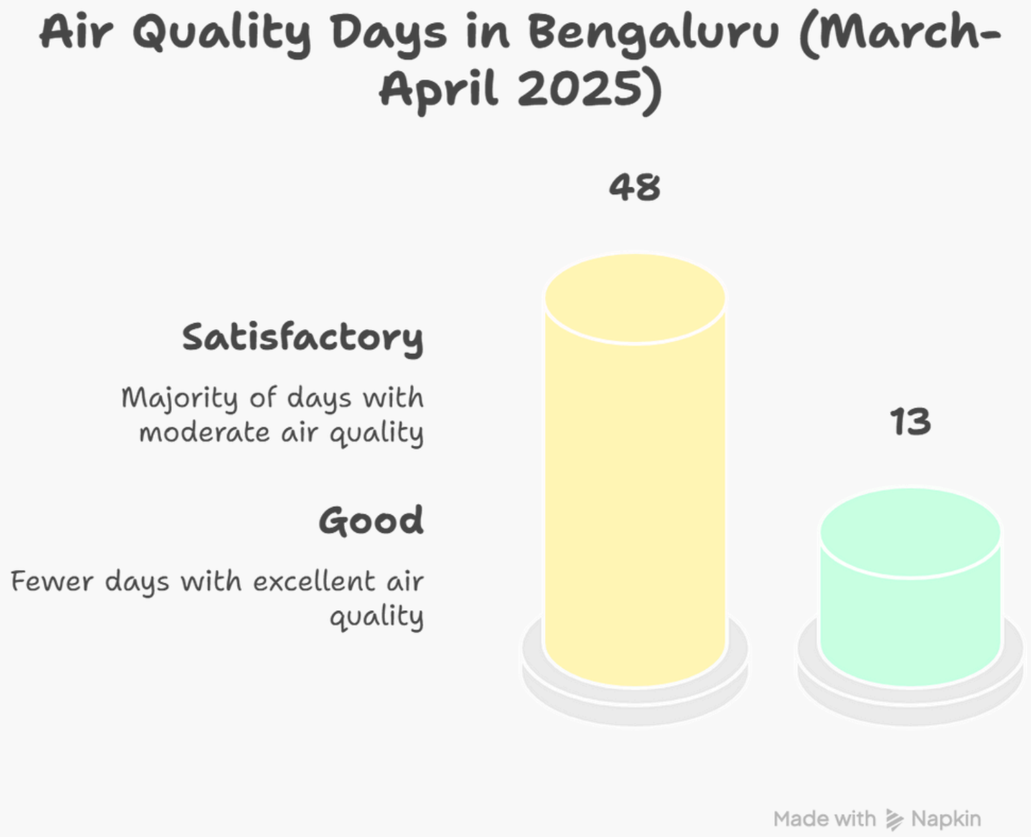
5. List the top 5 states with high EV adoption and analyse if their average AQI is significantly better compared to states with lower EV adoption.





Top-5 EV states (Karnataka, UP, Rajasthan, Tamil Nadu, Maharashtra) show significantly lower average AQI than the rest . EV adoption correlates with better air quality in our data, though other sources (industry, dust, biomass burning) still drive pollution in several states.

6. For the city of Bengaluru, how many days fell under each air quality category (e.g., Good, Moderate, Poor, etc.) between March and May 2025?



The data indicates that over the 61-day period (March and April), the air quality in Bengaluru was predominantly in the "Satisfactory" category. A smaller portion of the days experienced "Good" air quality.

Secondary Analysis

1. Which age group is most affected by air pollution-related health outcomes — and how does this vary by city?

Analysis:

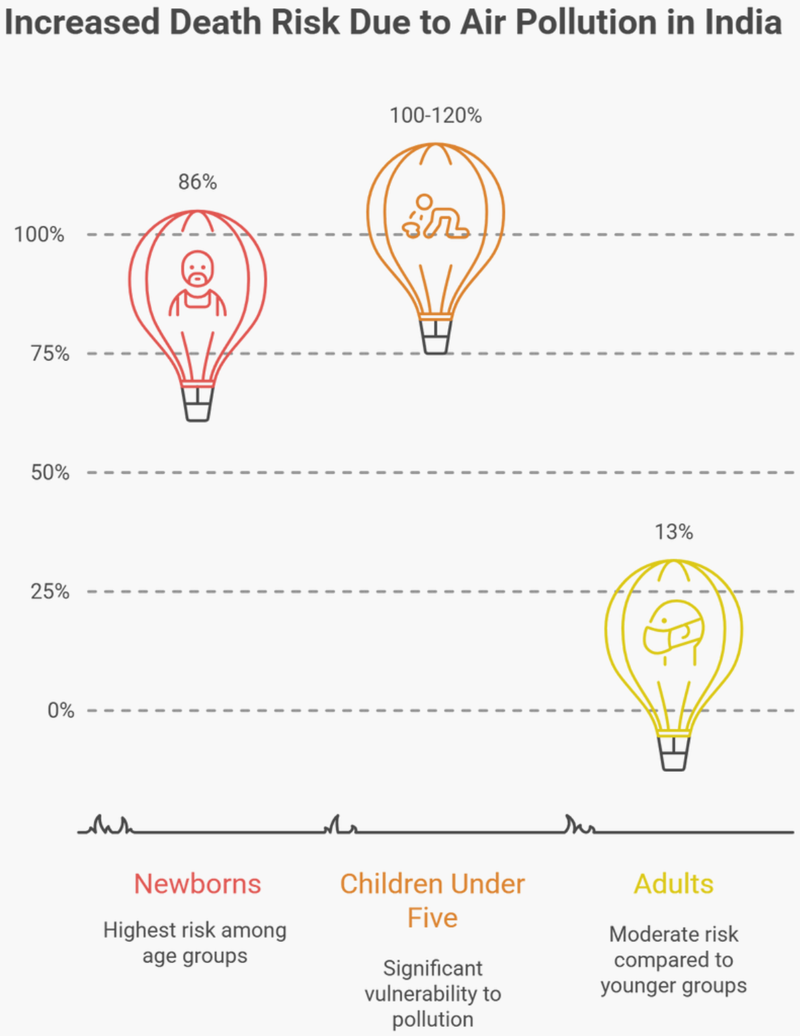
"When analyzing air pollution-related health outcomes by age group, clear patterns emerge.

Children under 12 show the highest rates of asthma and bronchitis, particularly in cities like Bengaluru and Chennai.

Elderly populations above 60 face the greatest risk of hospitalization and severe outcomes, with Delhi showing the sharpest rise due to persistent smog and winter pollution.

In contrast, coastal cities like Mumbai show a slightly reduced impact, although cardiovascular risks remain high among middle-aged groups.

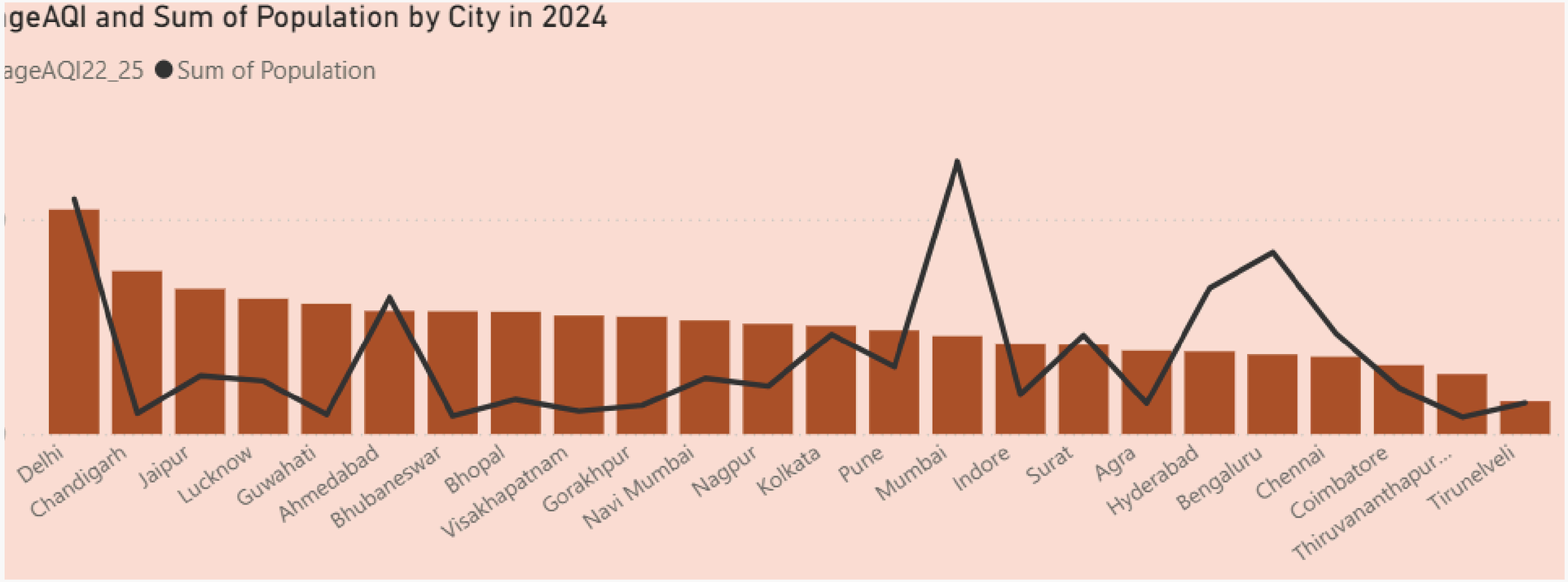
This highlights how both age and city environment play critical roles in determining vulnerability to air pollution.



2. Who are the major competitors in the Indian air purifier market, and what are their key differentiators

Brand	Price Range (INR)	Key Differentiator	CADR (m^3/h)	Coverage Area (sq. ft.)
Blueair	25000-35000	High CADR (clean air delivery rate)	620	540
Coway	15000-20000	Durable filters with long lifespan	303	355
Dyson	40000-50000	Premium design & advanced filtration	310	600
Honeywell	8000-12000	Energy-efficient and low noise	300	450
Mi	10000-12000	Affordable smart features	380	484
Philips	15000-20000	Trusted brand & strong after-sales	333	400
Sharp	12000-15000	Unique Plasmacluster technology	240	320

3. What is the relationship between a city's population size and its average AQI — do larger cities always suffer from worse air quality? (Consider 2024 population and AQI data for this)



- Northern India is more affected by air pollution than southern India.
- Population is not the only driver of air pollution — industrial activity, vehicular density, and geography also matter.
- This suggests the need for city-specific air quality policies, rather than a one-size-fits-all approach.

4. How aware are Indian citizens of what AQI (Air Quality Index) means — and do they understand its health implications?

Most Indians know what AQI is, but fewer understand what each level means for their health. Bridging this gap through education, media, and localized tools is essential for creating real behavioral change.

5. Which pollution control policies introduced by the Indian government in the past 5 years have had the most measurabl impact on improving air quality — and how have these impacts varied across regions or cities?

- NCAP and BS-VI standards had the broadest measurable impact nationwide, especially in reducing PM10 and vehicular emissions.
- GRAP and localized bans helped in short-term seasonal control, mainly in Delhi-NCR.
- Impact varies by region — Tier-2 cities show consistent improvements, while Delhi and other megacities still struggle due to multi-source pollution and enforcement challenges.

Project Objectives

Analysis Phase

Data Sources: AQI data (Datafull Aqi data), Google Trends (consumer interest), market reports.

Key Findings:

- North & Central India = worst AQI → highest demand potential.
- Southern India = emerging market, growing awareness.
- Consumer searches for air purifiers peak from October–January.

Gap Identified: Current products lack real-time AQI/PM10 display and compact designs tailored for Indian homes.

Strategy Development

Target Market:

- Primary: North & Central India (high pollution).
- Secondary: South India (growing awareness).

Product Strategy:

- Smart purifiers with real-time AQI & PM10 sensors.
- Compact, affordable design for urban households.

Marketing Strategy:

- Seasonal campaigns during Oct–Jan peak.
- Educational campaigns in Southern states (AQI awareness + health benefits).

Implementation Plan

Phase 1 (Short-term):

- Launch a pilot product in North India metros (Delhi, Lucknow, Kanpur).
- Digital campaigns around AQI awareness.

Phase 2 (Mid-term):

- Expand to Tier-2 cities in North & Central India.
- Partner with health & wellness influencers.

Phase 3 (Long-term):

- Scale to South India with localized campaigns.
- Introduce premium models with IoT integration & mobile apps.