

ARE CITIES IN SOUTHERN INDIA BREATHING SAFE AIR?

AN AIR QUALITY ANALYSIS OF 10 CITIES FROM SOUTH INDIA

A report by Greenpeace India



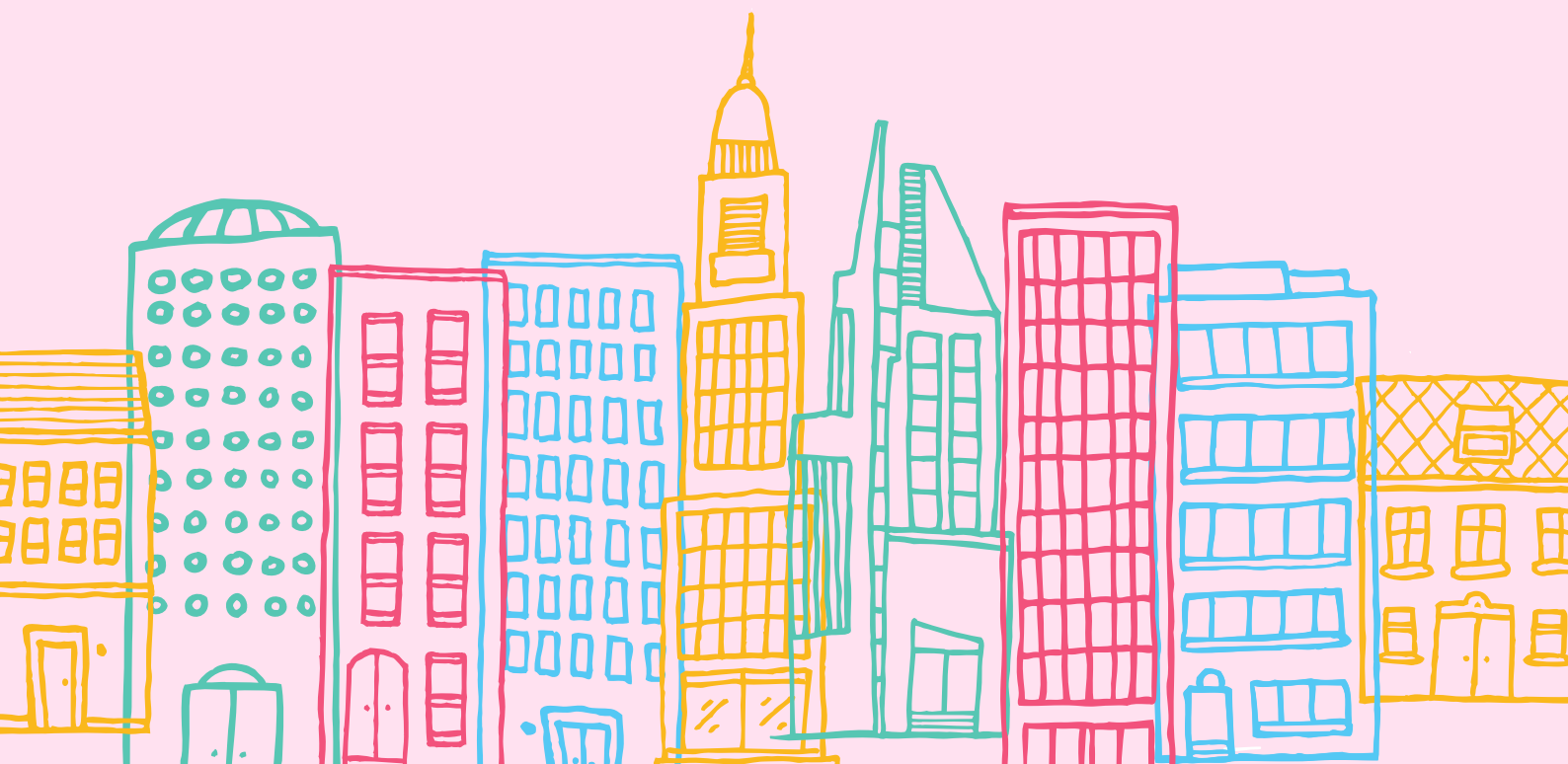
Are Cities in Southern India Breathing Safe Air?

An Air quality analysis of 10 cities from South India

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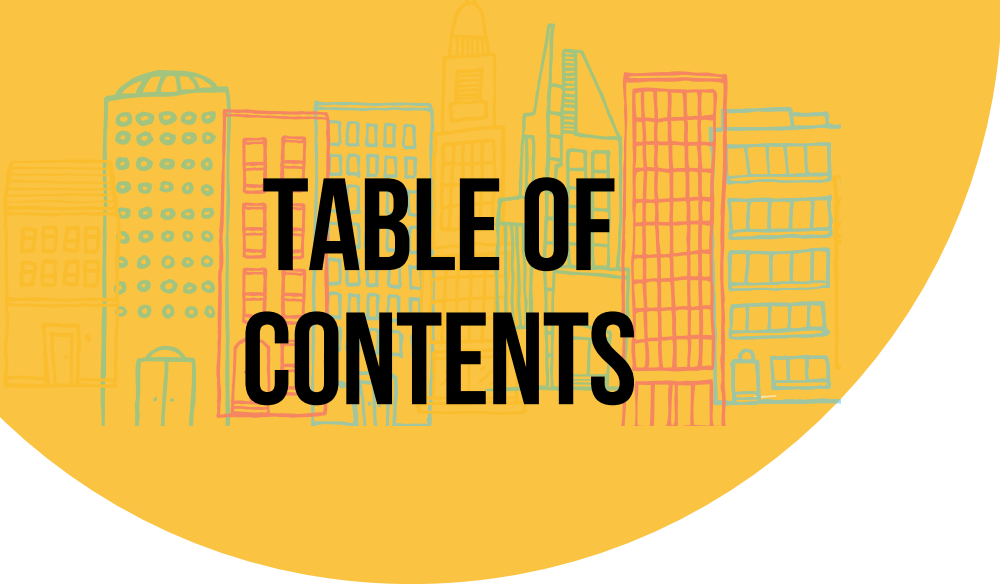


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INTRODUCTION

Air pollution in recent years has become one of the most critical environmental issues. **Poor air quality has a detrimental impact on public health and well-being.** Almost every Indian city exceeds the recommended WHO air quality levels. On September 22, the WHO announced the updated air quality guidelines for the first time in 15 years.

The new guidelines are derived from strong scientific evidence of the damage air pollution inflicts on human health and hence, recommends new air quality levels based on reducing concentrations of key air pollutants. In India, the national ambient air quality standards (NAAQS) for some pollutants are already exceeding the WHO air quality guidelines. There is enough evidence to establish that even low-level exposure to air pollution is harmful to humans, especially with chronic exposure. It is increasingly evident that **there is no safe level of air pollution.**




In India, Cities across the country are breathing polluted air. Air pollution is not limited to north Indian cities. Greenpeace India's report Airpocalypse IV highlighted that more than 80% of cities/towns had PM10 levels exceeding the 60 $\mu\text{g}/\text{m}^3$ limits prescribed under National Ambient Air Quality Standards (NAAQS) by CPCB in 2018.

Considering this in mind, Greenpeace India has analysed the air quality data of the 10 southern Indian cities. The analysis of Central Pollution Control Board (CPCB) data reveals that the average pollution levels in these 10 cities have **far exceeded** the new WHO air quality guidelines. This analysis indicates that **air pollution is a public health crisis** not only in north Indian cities but also in south Indian cities. We need a comprehensive, systemic, and time-bound action to reduce the air pollution levels. If we don't act now, these south Indian cities are not too far behind from cities like Delhi in terms of the health and economic impact of air pollution.



KEY INSIGHTS

- Ambient PM 2.5 is the third largest risk factor for deaths in India, causing an estimated **1.1 million deaths per year** in India according to the global burden of disease (Cohen et al., 2017).
- This analysis focuses on the 10 south Indian cities and finds that air pollution is a matter of concern for south Indian cities as well. These cities are selected based on the availability of data, population and monitoring station network.
- The analysis of CPCB data finds that despite having lockdown and comparatively fewer economic activities, the annual average levels of PM2.5 and PM10 in all studied 10 south Indian cities have **exceeded the WHO revised standards.**
- **There is no safe level of air pollution.** There is enough evidence that established that even low-level exposure to air pollution is harmful to humans.

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- Air pollution is a public health crisis not only in north Indian cities but also in south Indian cities. If we don't act now, these south Indian cities are not too far behind from cities like Delhi in terms of the health and economic impact of air pollution.
 - Air pollution increases the likelihood of **premature death and many medical conditions** including asthma, preterm birth, low birth weight, depression, schizophrenia, diabetes, stroke and lung cancer.
 - The state and city governments must promote decentralised renewable energy solutions such as rooftop solar, create integrated public transport, NMT friendly infrastructure and address other contributors like waste burning, construction sector, industrial emissions and biomass burning.

- The authorities must start the conversation with local residents: describe the health and financial problems of air pollution in their region and present the solutions. Governments must lead with policy and system-wide changes while supporting residents to make personal steps that benefit air quality.
- India's Central Pollution Control Board (CPCB) must **introduce new national ambient air quality standards** (NAAQS) based on the updated WHO air quality guidelines which are based on the latest scientific understanding.

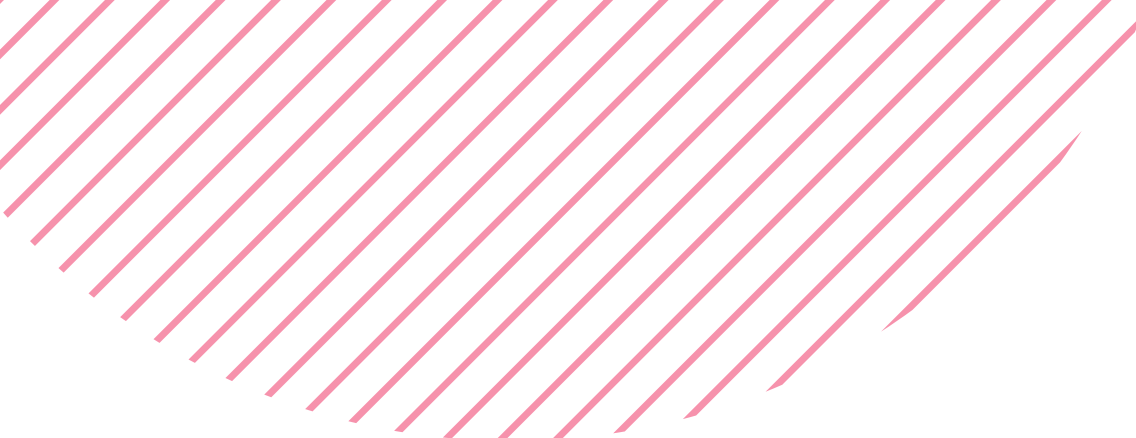
Pollutant	Average Period	NAAQS (µg/m3)	WHO Guidelines 2021 (µg/m3)
PM10 (Coarse particulate matter)	Annual avg.	60	15
	24 hours	100	45
PM2.5 (Fine particulate matter)	Annual avg.	40	5
	24 hours	60	15
O3 (Ozone)	Peak season	--	60
	8 hours	100	100
NO2 (Nitrogen dioxide)	Annual avg.	40	10
	24 hours	80	25
SO2 (Sulfur dioxide)	24 hours	50	40

A comparison of the WHO standards for common pollutants vs the NAAQS standards for the same



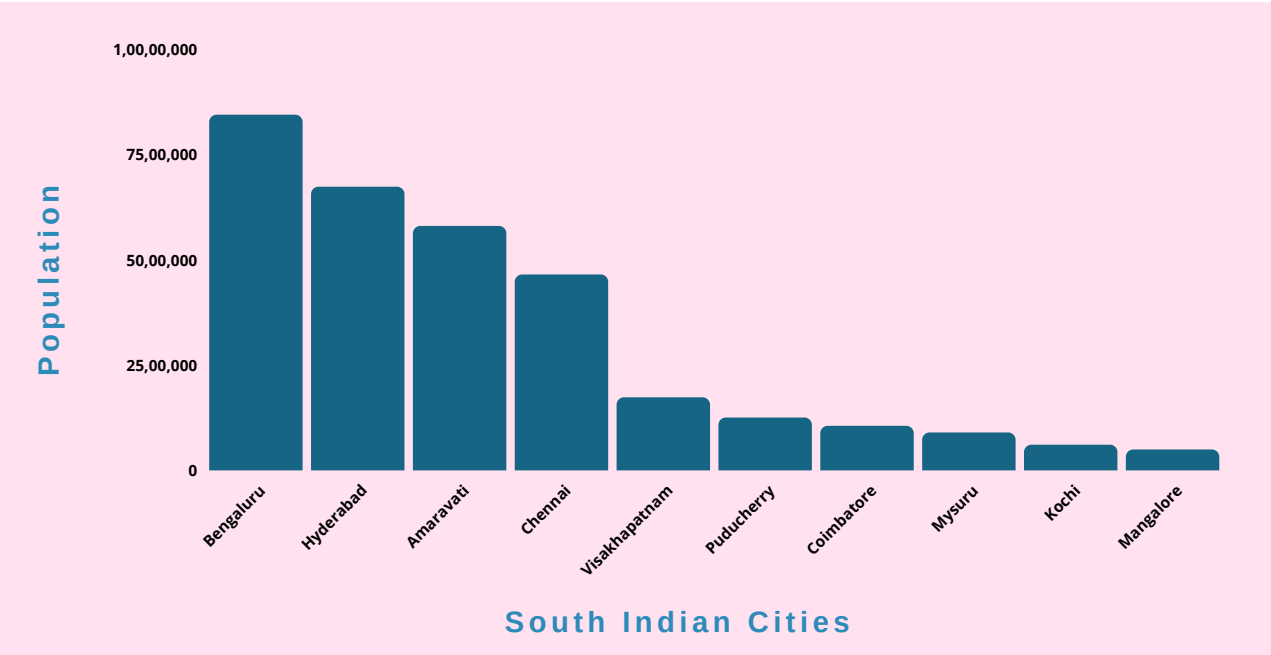
METHODOLOGY

According to the data published by CPCB's official dashboard Central Control Room for Air Quality Management, annual average values of PM_{2.5} and PM₁₀ analysis is performed for selected south Indian cities. These cities are selected based on the availability of data, population and monitoring station network. The data is obtained from 20th November 2020 to 20th November 2021. The qualitative and quantitative analysis is carried out by using prescribed air quality standards as referred by WHO and National ambient air quality (NAAQS).



Overall, it can be observed from all the graphs that the annual average levels of **PM2.5 and PM10 in all the cities have exceeded** the WHO revised standards.

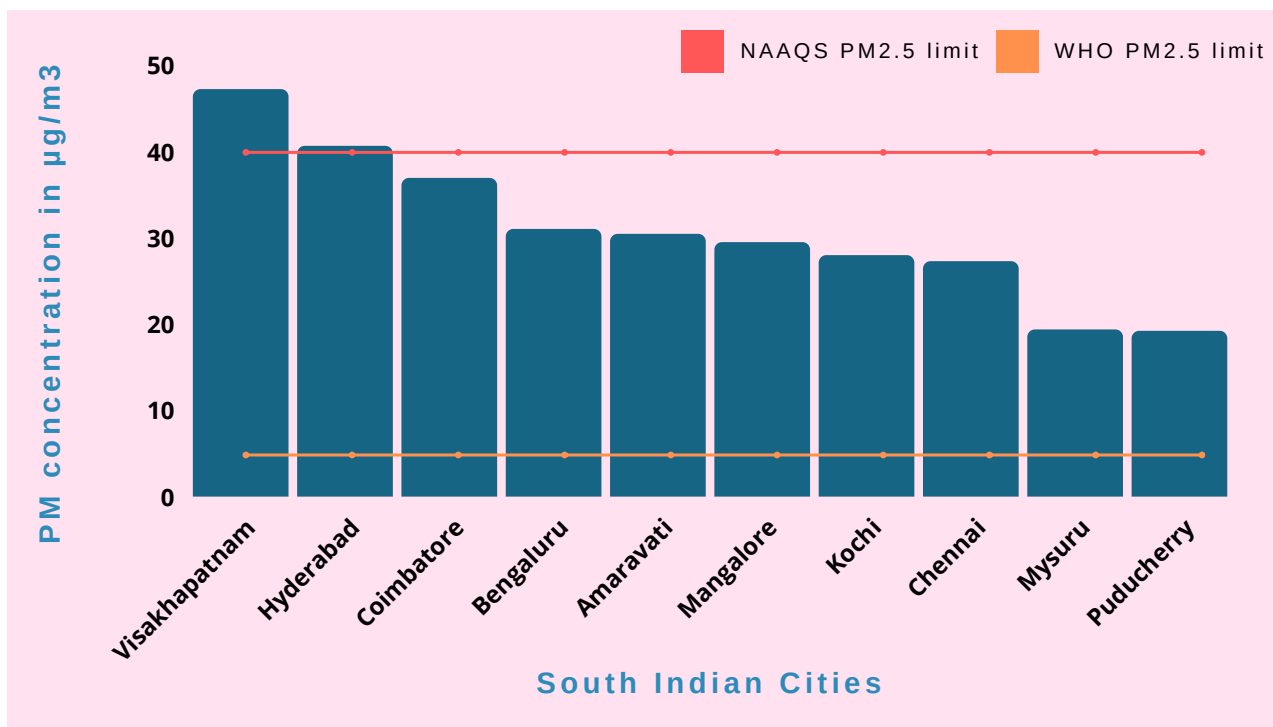
However, particulate matter levels in Visakhapatnam and Hyderabad exceeded the NAAQS standards as well. It can be clearly inferred from the comparative graphs of both parameters that there is dangerous concentration of particulate matter in these cities.



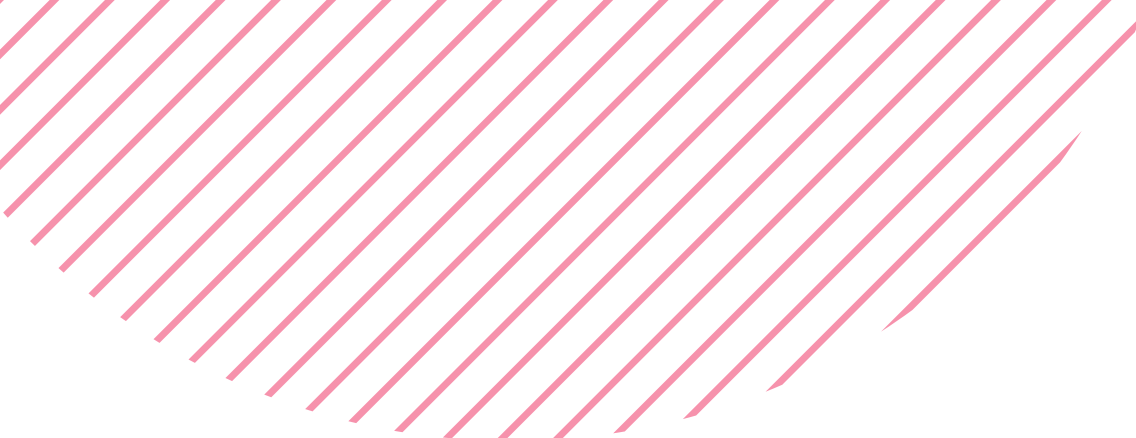
Population distribution across the South Indian cities

DATA ANALYSIS & FINDINGS

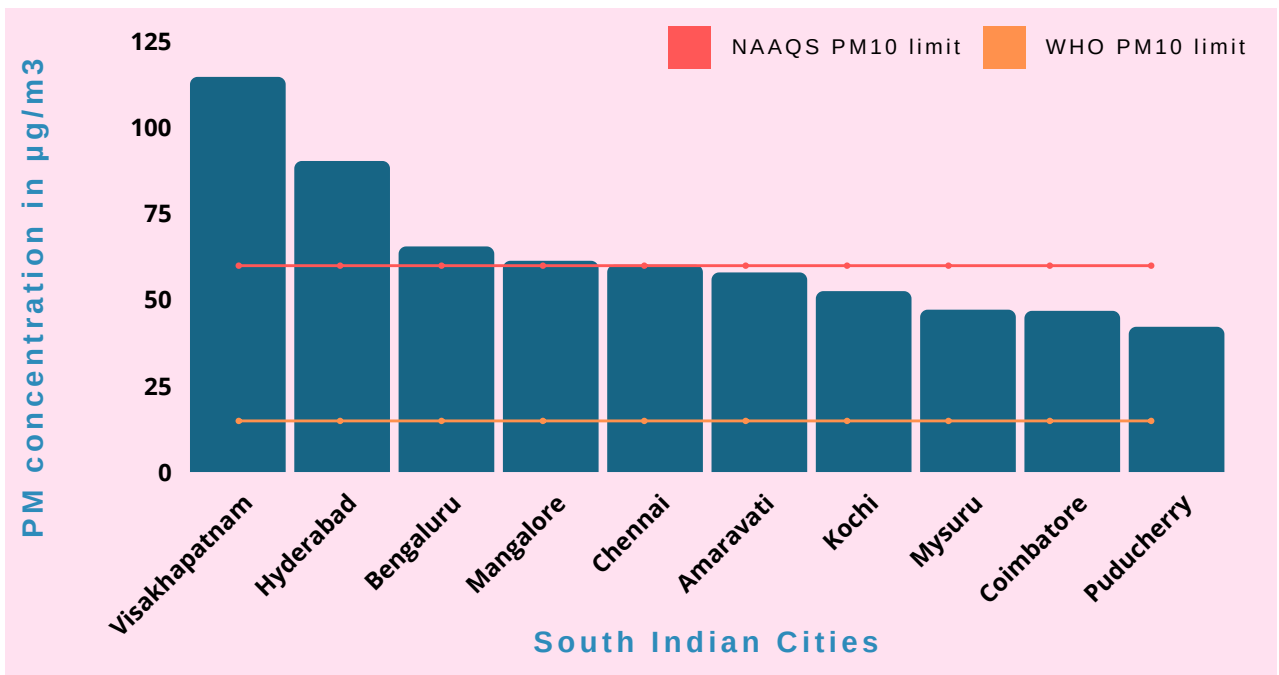
PM2.5 levels in Visakhapatnam and Hyderabad have exceeded WHO guidelines by **7 to 8 times**. Coimbatore, Bengaluru, Amaravati, and Mangalore have recorded PM2.5 levels exceeding the WHO limits by **6 to 7 times**. Meanwhile, Chennai, Kochi, Mysuru and Puducherry have exceeded the said limits by **4 to 5 times**.




Annual average PM2.5 values of South Indian cities with respect to NAAQS and WHO revised standards



If we talk about PM10, then Visakhapatnam and Hyderabad have exceeded WHO guidelines by **6 to 7 times**, Bengaluru, Mangalore, Amaravati, Chennai and Kochi have exceeded the said limits by 3 to 4 times and Mysuru, Coimbatore and Puducherry have exceeded it by **2 to 3 times**. Additionally Visakhapatnam and Hyderabad's PM10 levels are 1.5 to 2 times higher than NAAQS prescribed standards and the rest of the cities are mostly within the limits.



Annual average PM10 values of South Indian cities with respect to NAAQS and WHO revised standards



STUDY OF THE TOP THREE METRO CITIES

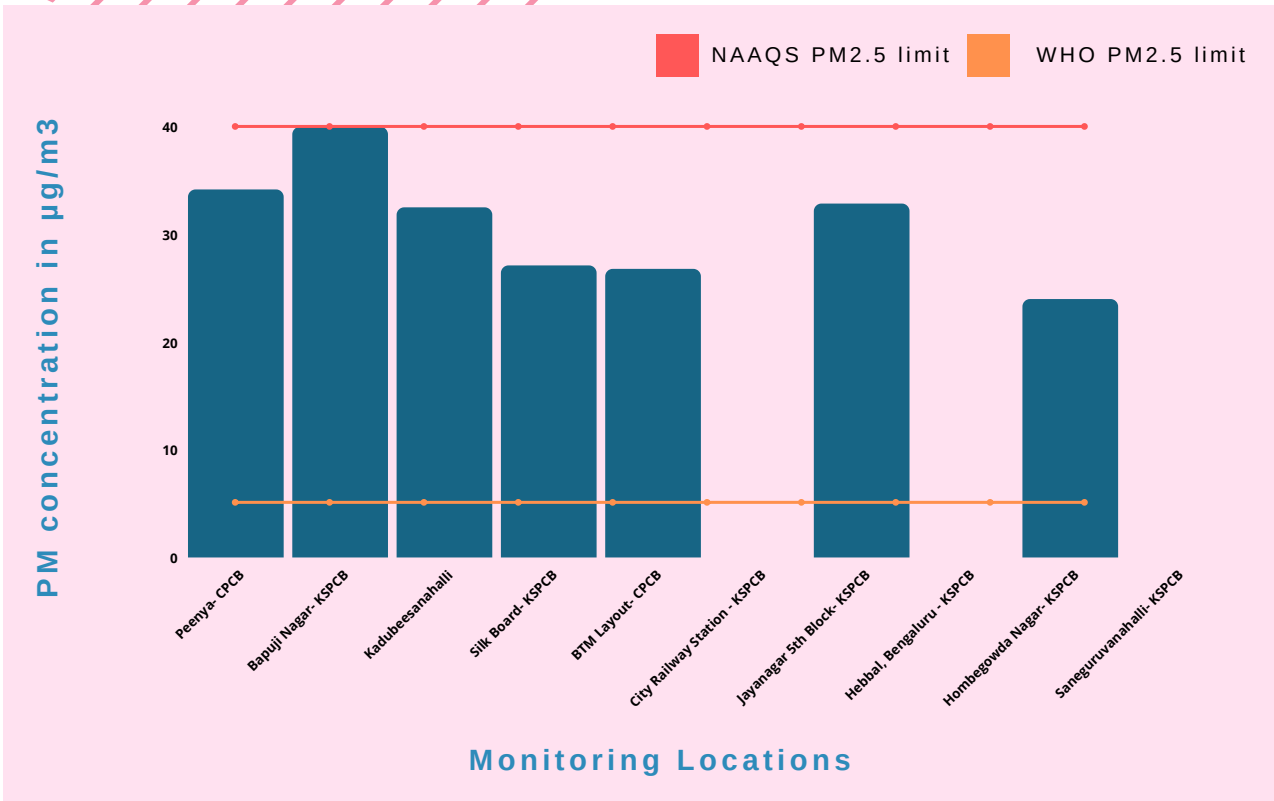
Above all the mentioned cities, **Bengaluru, Hyderabad and Chennai** are the metros and capital cities of three states Karnataka, Telangana and Tamil Nadu. There are some primary factors that affect the air quality i.e. fossil fuel burning in the power and transport sector, industrial activity, waste burning, construction activity and many more which contributes to the rapid increase in ambient air pollution (AAP). According to an online tool developed by IQAir AirVisual and Greenpeace Southeast Asia, air pollution was responsible for **12000, 11000, and 11,000 premature deaths** respectively in Bengaluru, Hyderabad, and Chennai in 2020.



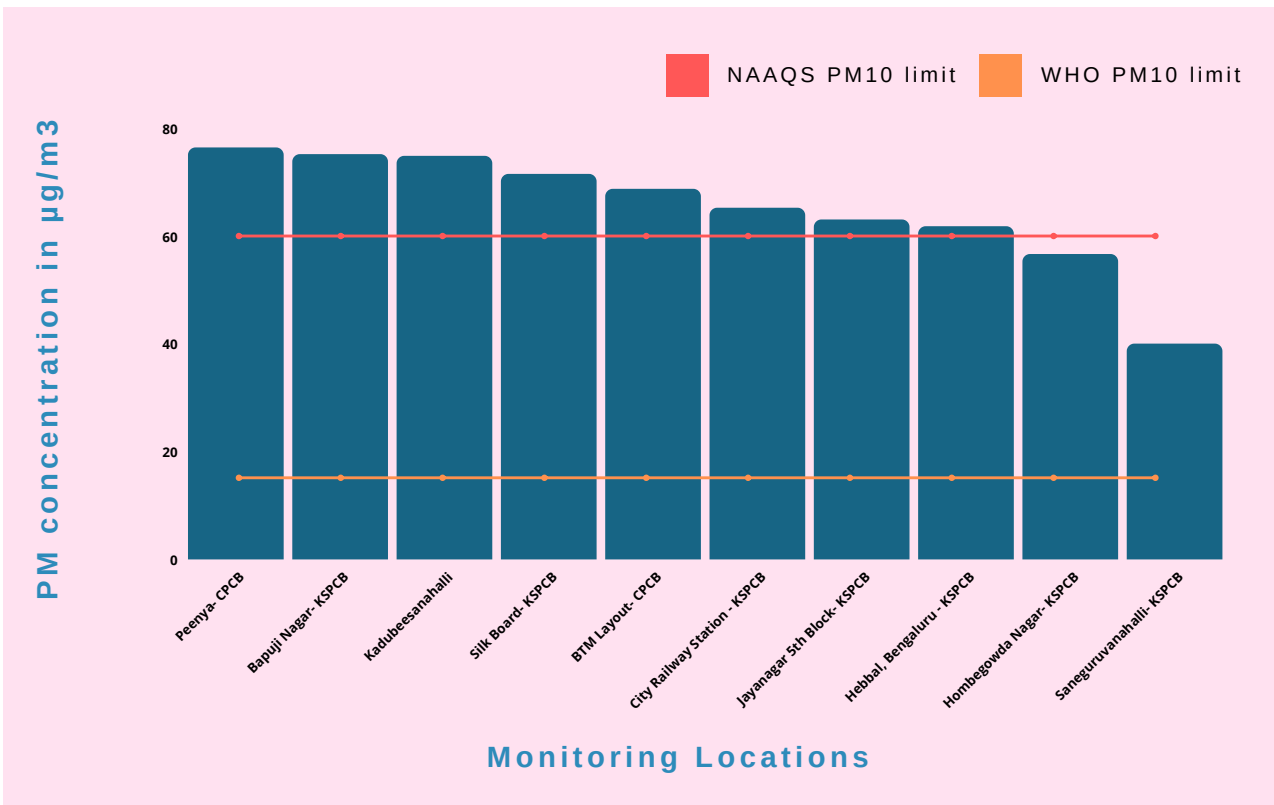
BENGALURU

In the city, there are **10 monitoring stations** located by CPCB and KSPCB. BTM layout, Bapuji Nagar, Hombegowda Nagar, Jayanagar 5th block and Saneguruvanahalli are commercial sectors. Hebbal, Silk Board, Peenya and BWSSB Kadubeesanahalli and industrial sectors.

The annual average values of PM 2.5 and PM10 at all the locations are **higher than WHO revised standards**. However, while PM 2.5 values at all the station's are within the NAAQS standards, PM 10 values at eight stations are **higher than the NAAQS standards**.



Annual average PM2.5 values of Bengaluru city with respect to NAAQS and WHO revised standards

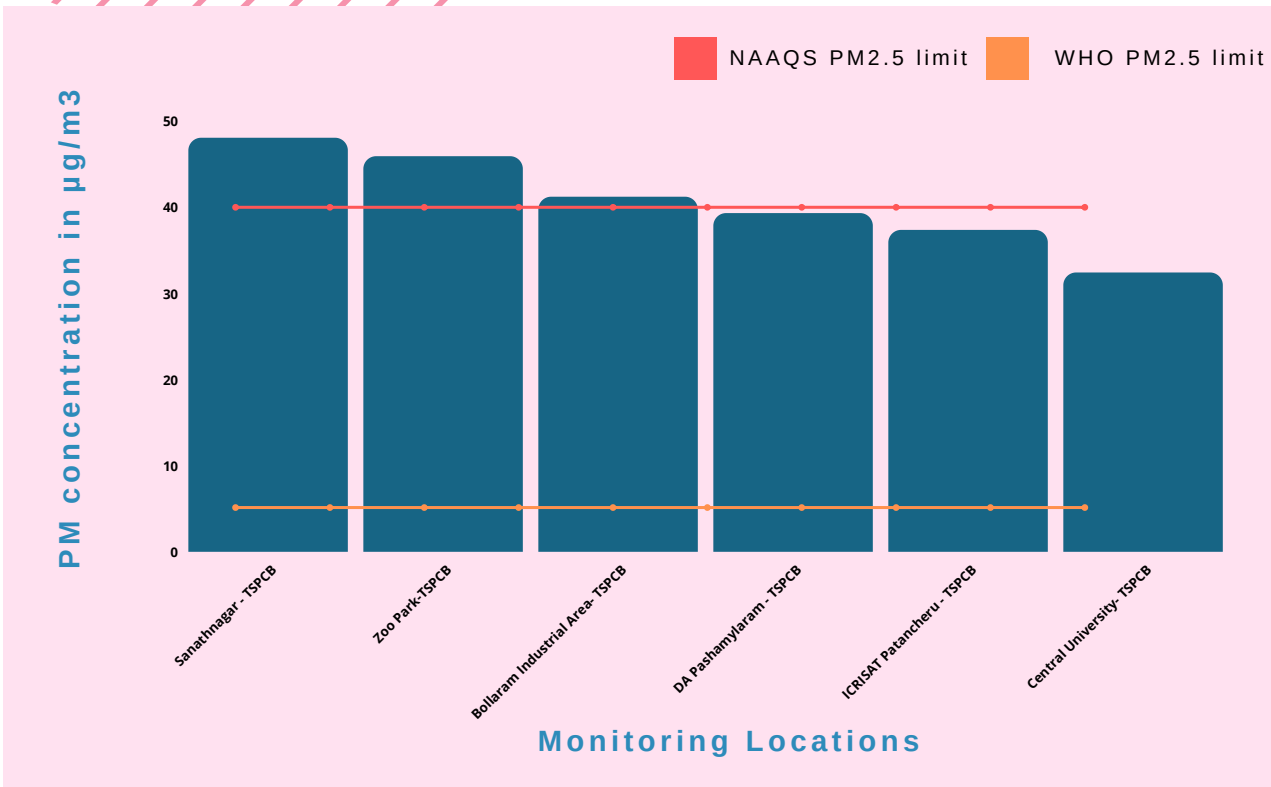


Annual average PM10 values of Bengaluru city with respect to NAAQS and WHO revised standards

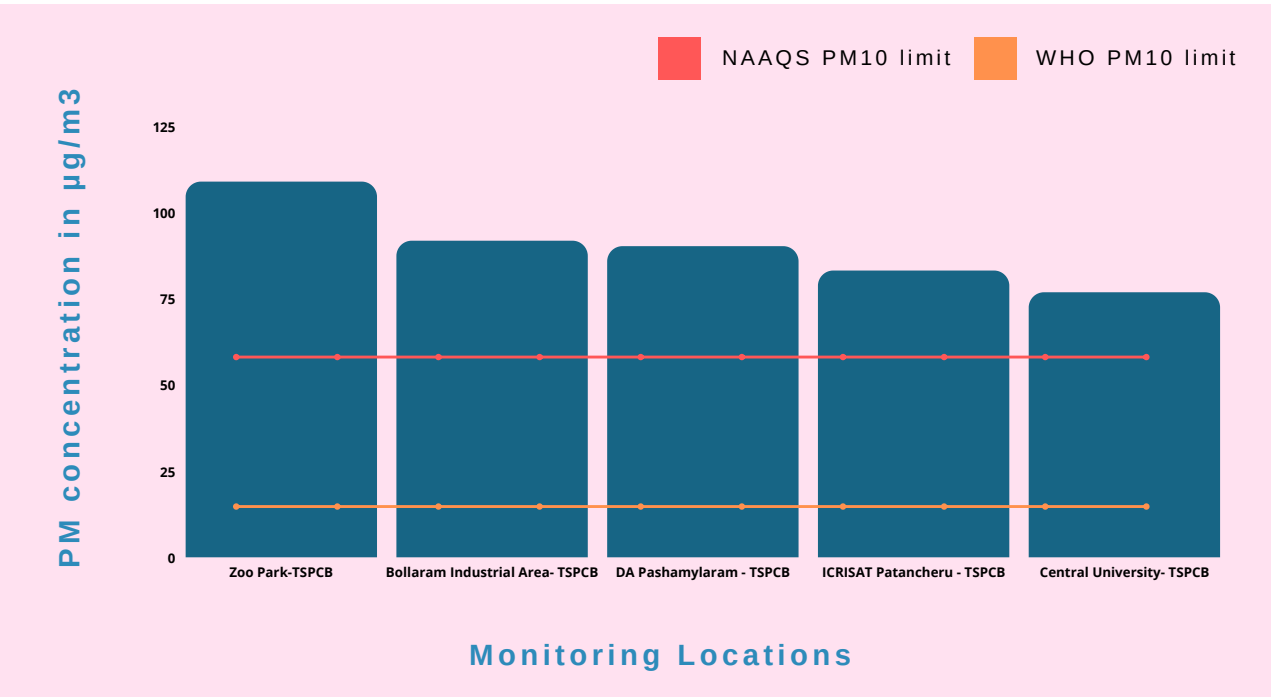


HYDERABAD

In Hyderabad city, there are **6 monitoring stations** located by CPCB and TSPCB. The annual average values of PM 2.5 and PM 10 shows that at all the locations, the values are higher than WHO revised standards. Additionally, PM 2.5 levels in three stations and PM10 levels in all the stations were found to be exceeding the NAAQS standards.



Annual average PM2.5 values of Hyderabad city with respect to NAAQS and WHO revised standards

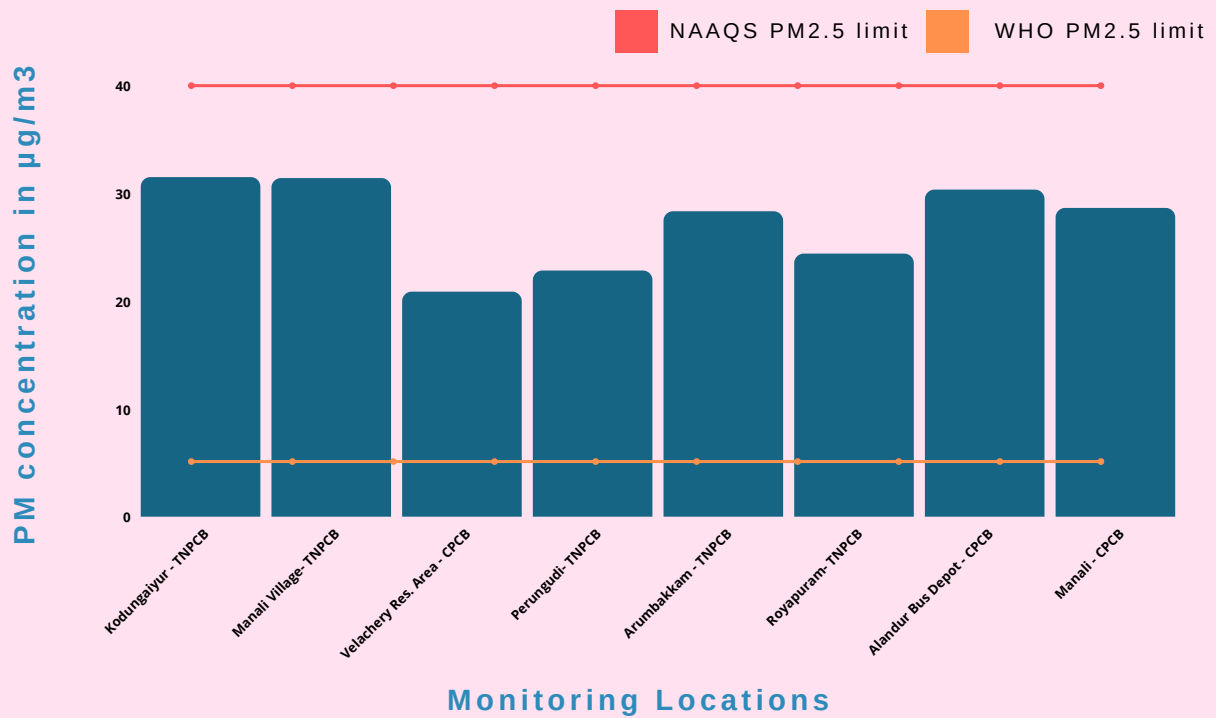


Annual average PM10 values of Hyderabad city with respect to NAAQS and WHO revised standards

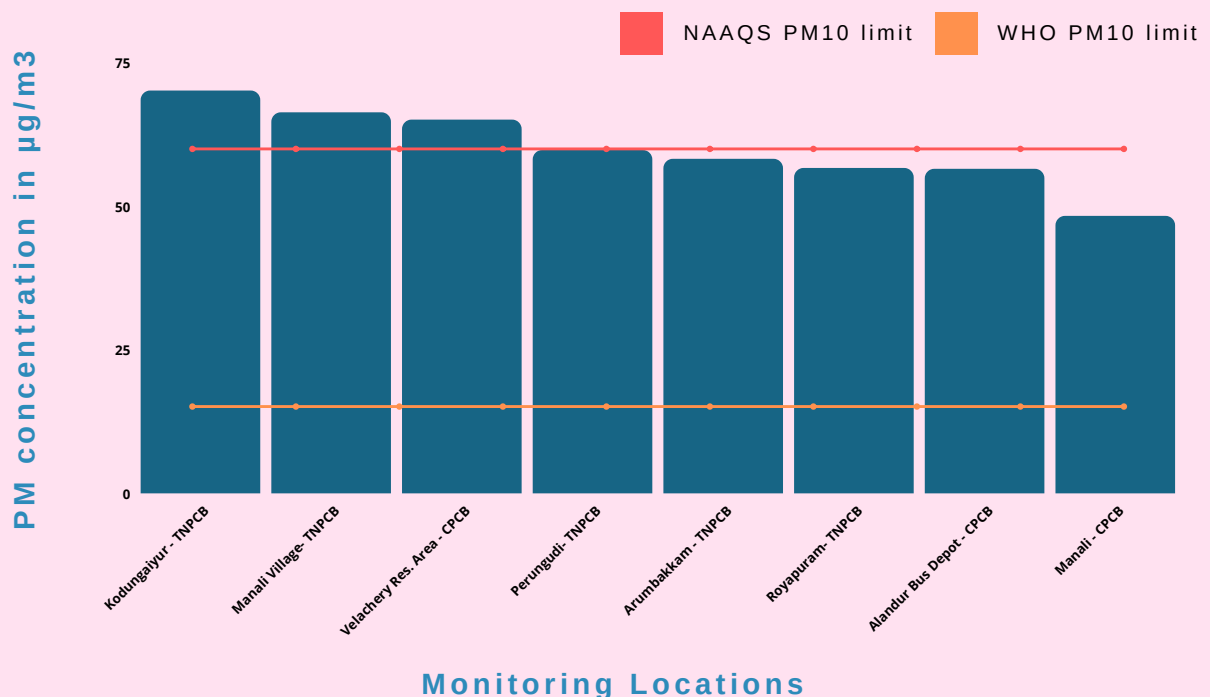


CHENNAI

In Chennai city, there are **8 monitoring stations** located by CPCB and TNPCB. The annual average values of PM_{2.5} and PM₁₀ shows that at all the locations, the values are higher than WHO revised standards. Additionally, apart from PM₁₀ values in three locations all other stations were found to be within the NAAQS standards.



Annual average PM2.5 values of Chennai city with respect to NAAQS and WHO revised standards



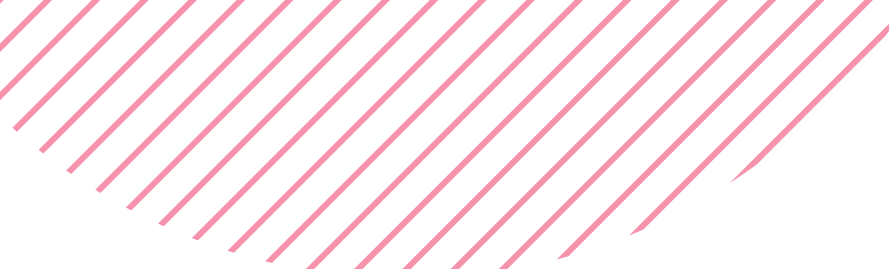
Annual average PM10 values of Chennai city with respect to NAAQS and WHO revised standards



WAY FORWARD


Air pollution increases the likelihood of premature death and many medical conditions including asthma, preterm birth, low birth weight, depression, schizophrenia, diabetes, stroke and lung cancer. This is the case even in places where air pollution levels meet the 2005 WHO Air Quality Guidelines. **The health impact also takes a financial toll.** Work absences due to sickness and lost life years due to premature death are accompanied by a substantial financial cost to society. Thus, we must act on the air pollution crisis and safeguard public health and the nation's economy.


The good thing is that we know the solution to air pollution. With the help of a **coordinated and consistent action plan** to tackle major sources of pollution, we can ensure cleaner air for our citizens.



Here are some recommendations and actions that need to be taken to address the air pollution crisis:

- The state and city governments need to urgently **seek alternatives to burning fossil fuels** for power, transport and industry because burning fossil fuels is one of the major sources of air pollution. The local government must promote decentralised renewable energy solutions like rooftop solar and address other contributors like vehicular emissions, waste burning, construction sector, industrial emissions and biomass burning.
- The state and city governments must **prioritise the provision of transport infrastructure** that revolves around walking and cycling – or for longer distances and people with additional needs, electric buses, and trains – and stop using fossil-fuelled modes of private transport.

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- **Establish car-free days or zones in cities** to (i) alleviate pollution (ii) encourage people to enjoy the streets safely and (iii) illustrate that it is possible to travel about the city without private vehicles.
 - **Create green spaces in the city** and encourage biodiversity by planting local trees and encouraging wildflowers to grow.
 - The local **government must start communicating with local residents**: describe the health and financial problems of air pollution in their region and present the solutions. Governments must lead with policy and system-wide changes while supporting residents to make personal steps that benefit air quality.
 - Plan for the people rather than vehicles by **providing sustainable mobility and accessibility to all citizens** to jobs, education, social services and recreation at an affordable cost and within reasonable journey time.

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- Recognize that people occupy centre-stage in our cities and all plans would be for their common benefit and well being. Thus, bringing a more **equitable allocation of road space** with people, rather than vehicles, as its main focus.
 - India's Central Pollution Control Board (CPCB) must **introduce new national ambient air quality standards (NAAQS)** based on WHO air quality guidelines which are based on the latest scientific understanding.
 - The cities under the **National clean air program (NCAP)** should also express the ambition to move to NAAQS in a time-bound manner first and then should have a timeline to move towards the WHO guidelines.



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