

# Monthly ambient air quality snapshot for India

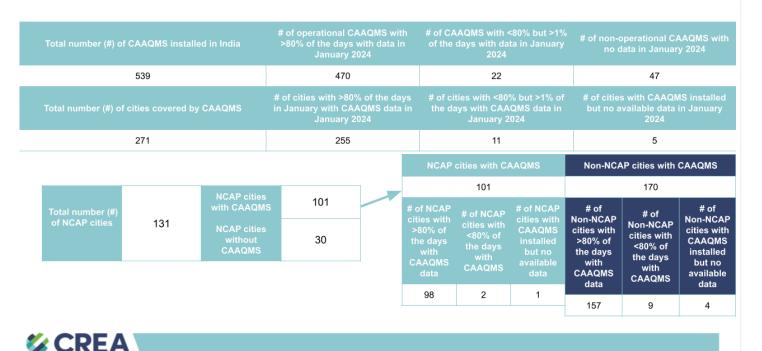
January 2024

#### **Key highlights**

- Only 101 of 131 cities identified as non-attainment cities under NCAP have a CAAQMS installed as of January 2024
- In January 2024, the monthly average PM2.5 levels in 98 NCAP cities surpassed the WHO's daily guideline for PM<sub>2.5</sub>. Only 32 cities met India's daily National Ambient Air Quality Standards (NAAQS).
- Among the 157 non-NCAP cities with over 80% of days with CAAQMS data, only three cities—Satna (Madhya Pradesh), Mandikhera (Haryana), and Gangtok (Sikkim)—reported monthly average PM<sub>2.5</sub> levels below the WHO daily guideline. 68 cities adhered to the daily NAAQS, while the air quality in the remaining 89 cities was poorer than the NAAQS.
- The combination of low wind speed and cooler temperatures in northern India led to the formation of stable atmospheric conditions, hindering the rapid dispersion of emissions and resulting in the accumulation of pollutants near the Earth's surface, thereby elevating ambient air pollution levels. While natural atmospheric conditions are beyond human control, it is the baseline emissions that primarily contribute to the escalation of hazardous air pollution levels in any region.
- Delhi ranked as the most polluted city in India in January 2024, with Bhagalpur following closely behind, recording a monthly average PM<sub>2.5</sub> concentration of 206 μg/m³, surpassing the daily NAAQS each day of the month. Among India's top 10 polluted cities, two were in Bihar, two in Rajasthan, two in Uttar Pradesh, one in Assam, one in Haryana, one in Himachal Pradesh, and one in Delhi.
- A total of 51 cities featured in the daily most polluted cities list in January 2024. 21 out of those made an appearance at least five times over the 31-day period, topped by Bhagalpur in Bihar, featuring the most times (29 days), followed by Delhi (28 days), Saharsa (21 days), Hanumangarh (14 days), Byrnihat, Greater Noida and Chapra (13 days each). The cities featured in the daily top 10 most polluted cities list in India were spread across 13 states and union territories (UT)
- Only 20 out of the 51 cities featured in the daily top 10 most polluted cities list during January 2024 are part of NCAP, while the remaining 31 cities still don't have any action plan to reduce hazardous air pollution concentrations.

#### Ambient air quality monitoring network

Real-time ambient air quality monitoring in India using Continuous Ambient Air Quality Monitoring Stations (CAAQMS) – January 2024



- Continuous Ambient Air Quality Monitoring Stations (CAAQMS) increased from 110 stations in 2018 to 539 stations across 271 cities in January 2024.
- While the National Clean Air Programme (NCAP) was announced in January 2019, identifying 102 cities as non-attainment, the number was updated to 131 cities, but only 101 of these 131 cities have a CAAQMS installed as of January 2024, leaving 30 other identified NCAP cities without any transparent information on real-time pollution level in these cities.
- Out of the total of 271 cities with CAAQMS installed as of January 2024, only 255 cities had more than 80% of the days in January with data availability, leaving 11 cities with less than 20% days with data and five cities where no data was collected even though CAAQMS were installed in those cities.

### Compliance of PM<sub>2.5</sub> concentration across Indian cities with the NAAQS and WHO guidelines – January 2024

	Total # of cities with >80% of the days with CAAQMS data												
	255												
# of	# of NCAP cities with >80% of the days with CAAQMS data # of non-NCAP cities with >80% of the days with CAAQMS data												
98							157						
# of NCAP cities with monthly average PM <sub>2.5</sub> concentration complying WHO daily guideline levels	# of NCAP cities with monthly average PM <sub>2.5</sub> concentration > WHO daily guideline levels	# of NCAP cities with monthly average PM <sub>2.5</sub> concentration complying to the daily NAAQS	# of NCAP cities with monthly average PM <sub>2.5</sub> concentration > the daily NAAQS	# of NCAP cities with monthly average PM <sub>2.5</sub> concentration > 2 times the daily NAAQS	# of non-NCAP cities with monthly average PM <sub>2.5</sub> concentration < WHO daily guideline levels	# of non-NCAP cities with monthly average PM <sub>2.5</sub> concentration > WHO daily guideline levels	# of NCAP cities with monthly average PM <sub>2.5</sub> concentration complying to the daily NAAQS	# of non-NCAP cities with monthly average PM <sub>2.5</sub> concentration > the daily NAAQS	# of non-NCAP cities with monthly average PM <sub>2.5</sub> concentration > 2 times the daily NAAQS				
0	98	32	66	15	3*	154	68	89	17				

\*Satna (Madhya Pradesh); Mandikhera (Haryana); and Gangtok (Sikkim)



#### **NCAP** cities

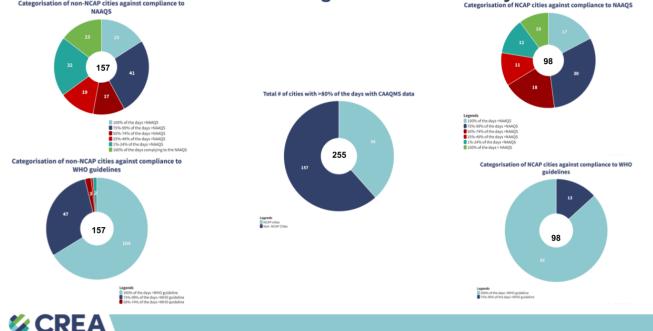
■ In January 2024, the monthly average PM<sub>2.5</sub> levels in 98 NCAP cities surpassed the WHO's daily guideline for PM<sub>2.5</sub>. Only 32 cities met India's daily National Ambient Air Quality Standards (NAAQS), with the remaining 66 cities recording PM<sub>2.5</sub> concentrations exceeding the NAAQS; among these, 15 cities registered levels more than double the prescribed standard of 60 µg/m³.

#### **Non-NCAP** cities

■ In January 2024, among the 157 non-NCAP cities with over 80% of days with CAAQMS data, only three cities—Satna (Madhya Pradesh), Mandikhera (Haryana), and Gangtok (Sikkim)—reported monthly average PM<sub>2.5</sub> levels below the WHO daily guideline. 68 cities adhered to the daily NAAQS, while the air quality in the remaining 89 cities was poorer than the NAAQS. Among these, 17 cities were at least twice as polluted as the daily NAAQS.

# Air pollution levels and National Clean Air Programme (NCAP)





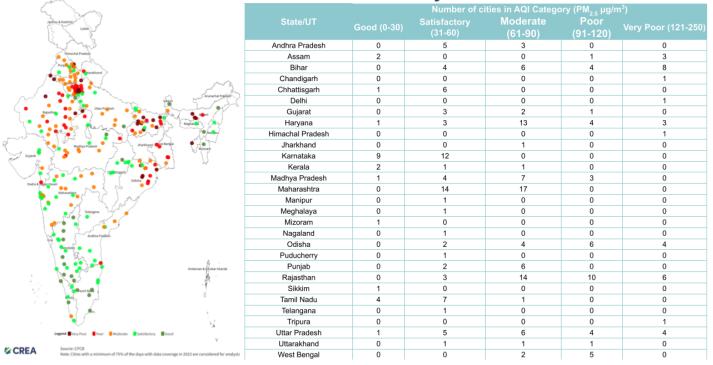
#### **NCAP** cities

- In January 2024, only ten out of the 98 NCAP cities achieved full compliance with the daily NAAQS for PM<sub>2.5</sub> concentration, while 17 cities consistently failed to meet this standard throughout the month.
- Additionally, 85 out of the 98 NCAP cities consistently recorded PM<sub>2.5</sub> levels exceeding the WHO-prescribed daily guideline levels every day of the month.

#### **Non-NCAP** cities

- Among the 157 non-NCAP cities, only 23 cities experienced 100% compliance with the NAAQS for all days of the month, while 25 cities had all days exceeding the NAAQS. 83 cities among the 157 recorded at least 15 days with PM<sub>2.5</sub> levels surpassing the daily NAAQS.
- 104 out of the 157 non-NCAP cities consistently recorded PM<sub>2.5</sub> levels above the prescribed daily WHO guideline on all days of the month.

Distribution of cities by GRAP categorisation based on monthly average PM<sub>2.5</sub> concentrations – January 2024

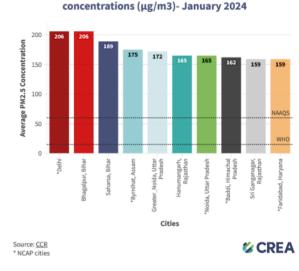


- The combination of low wind speed and cooler temperatures in northern India led to the formation of stable atmospheric conditions, hindering the rapid dispersion of emissions and resulting in the accumulation of pollutants near the Earth's surface, thereby elevating ambient air pollution levels. While natural atmospheric conditions are beyond human control, it is the baseline emissions that primarily contribute to the escalation of hazardous air pollution levels in any region.
- Nearly all states with high CAAQMS density in North India, particularly in the Indo-Gangetic Plain (IGP) region (including Punjab, Chandigarh, Haryana, Delhi, Bihar, and West Bengal, except Uttar Pradesh), as well as Odisha and the northeastern states of Assam and Tripura, experienced hazardous PM<sub>2.5</sub> concentrations.
- In contrast, most cities in the southern regions, spanning Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, and Telangana, exhibited PM<sub>2.5</sub> concentrations below the NAAQS.

## Ranking of the top 10 most polluted and cleanest cities in India

Top 10 most polluted cities in India by PM<sub>2.5</sub> concentration – January 2024

Day	Days in respective AQI Categories based on PM <sub>2.5</sub> (μg/m³)- January 2024												
City		Days > NAAQS		Satisfactory (31-60)			Very Poor (121-250)	Severe (>250)					
Delhi	31	31	0	0	0	0	27	4					
Bhagalpur	31	31	0	0	0	0	27	4					
Saharsa	31	31	0	0	0	2	27	2					
Byrnihat	26	26	0	0	0	1	24	1					
Greater Noida	31	31	0	0	2	2	24	3					
Hanumangarh	31	31	0	0	0	4	24	3					
Noida	31	31	0	0	1	3	25	2					
Baddi	31	31	0	0	2	6	20	3					
Sri Ganganagaı	31	31	0	0	0	2	28	1					
Faridabad	31	31	0	0	0	4	25	2					



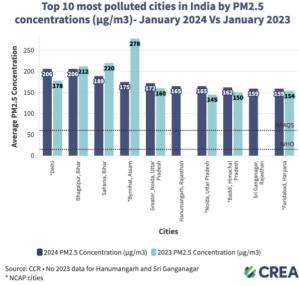
Top 10 most polluted cities in India by PM2.5



- Delhi ranked as the most polluted city in India in January 2024, with Bhagalpur following closely behind, recording a monthly average PM<sub>2.5</sub> concentration of 206 μg/m³, surpassing the daily NAAQS each day of the month. Among India's top 10 polluted cities, two were in Bihar, two in Rajasthan, two in Uttar Pradesh, one in Assam, one in Haryana, one in Himachal Pradesh, and one in Delhi.
- Following Delhi and Bhagalpur, the other cities in the top 10 most polluted list for January were Saharsa, Byrnihat, Greater Noida, Hanumangarh, Noida, Baddi, Sri Ganganagar, and Faridabad, respectively, from the third to the tenth positions. Notably, five NCAP and five non-NCAP cities were included in this list, underscoring the widespread issue of hazardous air quality across cities beyond the current focus list of non-attainment cities under the national programme.
- In the top 10 most polluted cities list, all cities recorded ambient air quality PM<sub>2.5</sub> concentrations exceeding the NAAQS by more than double for at least 25 days, with none reporting even a single day of good or satisfactory air quality.

### Status of PM<sub>2.5</sub> concentration in January 2023 for the top 10 most polluted cities in January 2024 across India

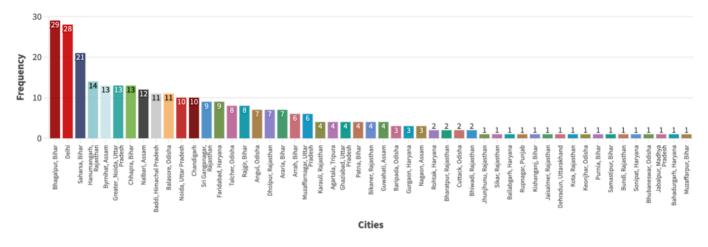
Days in respective AQI Categories based on PM <sub>2.5</sub> (μg/m³)- January 2023												
City	Monitored Days	Days > NAAQS	Good (0-30)	Satisfactory (31-60)	Moderate (61-90)	Poor (91-120)	Very Poor (121-250)					
Delhi	31	31	0	0	3	5	20	3				
Bhagalpur	31	31	0	0	0	1	23	7				
Saharsa	29	29	0	0	0	2	14	13				
Byrnihat	31	31	0	0	0	0	3	28				
Greater Noida	31	30	0	1	6	1	20	3				
Hanumangarh				No D	ata							
Noida	31	30	0	1	6	5	17	2				
Baddi	26	24	0	2	5	0	17	2				
Sri Ganganaga	•			No D	ata							
Faridabad	31	31	0	0	2	5	23	1				



- Two of the top 10 most polluted cities in Rajasthan, Hanumangarh and Sri Ganganagar, lacked comparable PM<sub>2.5</sub> concentrations from CAAQMS for the corresponding month last year. Among the remaining eight cities, five recorded higher PM<sub>2.5</sub> concentrations in January 2024 compared to the same month last year. However, there was a slight reduction observed in Bhagalpur and Saharsa in Bihar and a significant drop of more than 100 μg/m³ in Byrnihat, Assam.
- Additionally, the frequency of severe air quality days, defined as days with PM<sub>2.5</sub> concentrations exceeding 250 μg/m³, notably decreased in Byrnihat, Saharsa, and Bhagalpur in January 2024 compared to January 2023.



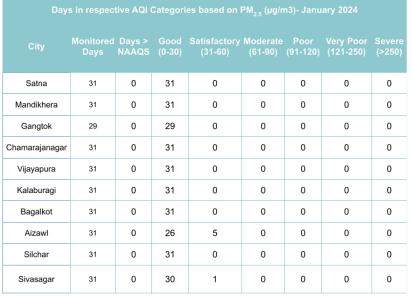
### Frequency of appearance of respective cities in top 10 most polluted cities list in India by PM<sub>2.5</sub> concentration – January 2024

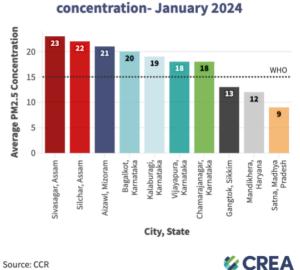




- A total of 51 cities featured in the daily most polluted cities list in January 2024. 21 out of those made an appearance at least five times over the 31-day period, topped by Bhagalpur in Bihar, featuring the most times (29 days), followed by Delhi (28 days), Saharsa (21 days), Hanumangarh (14 days), Byrnihat, Greater Noida and Chapra (13 days each).
- The cities featured in the daily top 10 most polluted cities list in India were spread across 13 states and union territories (UT), i.e, Assam, Bihar, Chandigarh, Haryana, Himachal Pradesh, Madhya Pradesh, Odisha, Punjab, Rajasthan, Tripura, Uttar Pradesh, Uttarakhand and Delhi, showing the widespread severity of hazardous air pollution levels nationally.
- Only 20 out of the 51 cities featured in the daily top 10 most polluted cities list during January 2024 are part of NCAP, while the remaining 31 cities still don't have any action plan to reduce hazardous air pollution concentrations.

### Status of PM<sub>2.5</sub> concentration in January 2023 for the top 10 cleanest cities in January 2024 across India



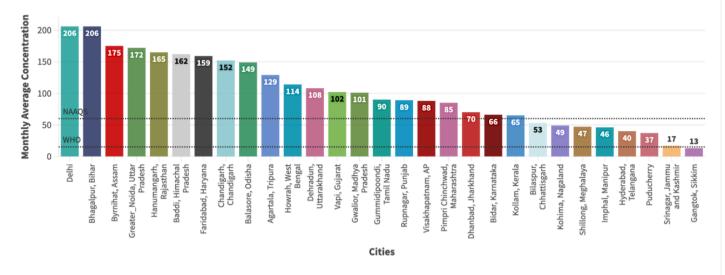


Top 10 cleanest cities in India by PM2.5

- Satna in Madhya Pradesh emerged as the cleanest city in India in January 2024, boasting a monthly average PM<sub>2.5</sub> concentration that placed all 31 days in the 'good' category (PM<sub>2.5</sub> concentration lower than 30 μg/m³). Following closely behind were Mandikhera in Haryana and Gangtok in Sikkim, both recording PM<sub>2.5</sub> concentrations below the WHO daily guideline level of 15 μg/m³.
- Additionally, other cities featured in the top 10 cleanest cities list for January 2024, including Chamarajanagar, Vijayapura, Kalaburgi, and Bagalkot in Karnataka, along with Aizawl in Mizoram, Silchar, and Sivasagar in Assam.



#### State-wise most polluted cities (PM<sub>2.5</sub>, µg/m³) in India – January 2024

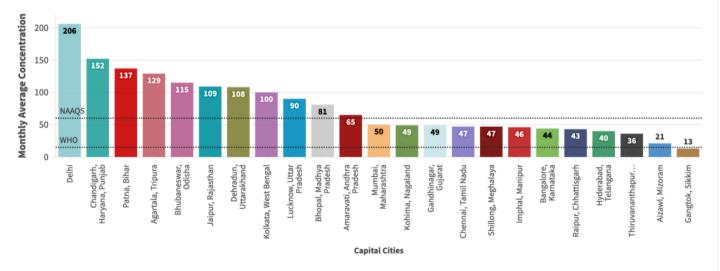


■ Among the 36 states and union territories (UT) in India, only 29 had at least one city with a functioning CAAQMS providing data for more than 80% of the days in January 2024. The remaining territories either lacked any installed CAAQMS, such as Andaman and Nicobar Islands, Dadra and Nagar Haveli and Daman and Diu, Goa, Ladakh, and Lakshadweep, or had inactive stations, as was the case in Jharkhand and Meghalaya.

Source: CCR



### PM<sub>2.5</sub> concentrations across state/provincial capital cities in India – January 2024



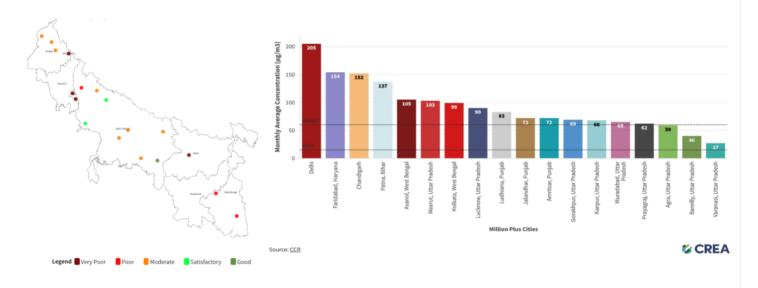
Itanagar (Arunachal Pradesh); Dispur (Assam); Panaji (Goa); Shimla (Himachal Pradesh); Ranchi (Jharkhand); Port Blair (Andaman and Nicobar Islands); Daman (Dadra and Nagar Source: CCR Haveli and Daman & Diu); Leh (Ladakh); and Kavaratti (Lakshadweep) don't have an operational CAAQMS. Srinagar (Jammu & Kashmir) don't have >80% data.



- In January 2024, 23 out of 36 state/UT capital cities had at least one CAAQMS installed, with data availability exceeding 80% of the days. However, the remaining 13 capitals lacked real-time data on air pollution levels.
- Among the 23 capitals with monitoring systems, 11 cities exhibited air quality surpassing the daily NAAQS set by the Central Pollution Control Board (CPCB). Moreover, except for Gangtok, all capitals recorded monthly average PM<sub>2.5</sub> concentrations exceeding the daily level recommended by the World Health Organization (WHO).

# Air pollution across cities with million plus population in Indo-Gangetic Plains (IGP)

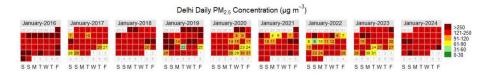
### PM<sub>2.5</sub> concentrations across million plus cities of Indo-Gangetic Plain in India (with CAAQMS)- January 2024



■ Out of 22 million plus cities across Indo-Gangetic Plain (IGP) states/UTs (Punjab, Chandigarh, Haryana, Delhi, Uttar Pradesh, Bihar, Jharkhand and West-Bengal), only 18 cities had an operational CAAQMS for more than 80% of the days in January 2024; others either didn't have CAAQMS installed, i.e., Sahranpur, Ranchi, and Jamshedpur, or the CAAQMS was inactive, i.e., Dhanbad.

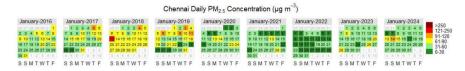
#### Air pollution across megacities in India – January 2024

#### Ambient air quality status in Delhi – January 2024 (PM<sub>2.5</sub> concentration, μg/m³)



Year												
Monitored Days	31	31	31	31	31	31	31	31	31			
Days > NAAQS	31	31	31	30	31	31	30	31	31			
% days > NAAQS	100	100	100	97	100	100	97	100	100			
Average (µg/m3)	236	156	190	204	157	194	154	178	205			
Days in AQI Scale (PM2.5 in µg/m3)												
Good (0-30)	0	0	0	0	0	0	0	0	0			
Satisfactory (31-60)	0	0	0	1	0	0	1	0	0			
Moderate (61-90)	0	2	0	1	3	2	3	3	0			
Poor (91-120)	0	4	1	2	8	3	7	5	0			
Very Poor (121-250)	18	24	25	15	18	21	18	20	27			
Severe (>250)	13	1	5	12	2	5	2	3	4			

#### Ambient air quality status in Chennai – January 2024 (PM<sub>2.5</sub> concentration, µg/m³)



Year													
Monitored Days	31	31	31	31	31	31	31	31	31				
Days > NAAQS	11	10	27	17	4	2	0	4	3				
% days > NAAQS	35	32	87	55	13	6	0	13	10				
Average (µg/m3)	55	54	73	59	43	41	26	48	47				
	Days in AQI Scale (PM2.5 in µg/m3)												
Good (0-30)	0	2	0	5	5	7	21	1	3				
Satisfactory (31-60)	20	19	4	9	22	22	10	26	25				
Moderate (61-90)	11	9	25	13	4	2	0	4	2				
Poor (91-120)	0	1	1	4	0	0	0	0	1				
Very Poor (121-250)	0	0	1	0	0	0	0	0	0				
Severe (>250)	0	0	0	0	0	0	0	0	0				

#### Ambient air quality status in Mumbai – January 2024 (PM<sub>2.5</sub> concentration, μg/m³)



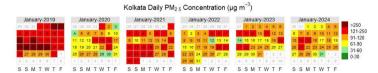
Year	Jan-19	Jan-20	Jan-21	Jan-22	Jan-23	Jan-24						
Monitored Days	31	31	31	31	31	31						
Days > NAAQS	18	21	30	25	30	5						
% days > NAAQS	58	68	97	81	97	16						
Average (μg/m3)	66	72	97	76	93	51						
	Days in AQI Scale (PM2.5 in µg/m3)											
Good (0-30)	1	2	0	1	0	1						
Satisfactory (31-60)	12	8	1	5	1	25						
Moderate (61-90)	16	13	9	20	13	5						
Poor (91-120)	2	8	18	3	16	0						
Very Poor (121-250)	0	0	3	2	1	0						
Severe (>250)	0	0	0	0	0	0						

#### Ambient air quality status in Bangalore – January 2024 (PM<sub>2.5</sub> concentration, μg/m³)



Monitored Days	31	31	31	31	31	31	31	31	31			
Days > NAAQS	23	0	0	10	1	0	0	0	2			
% days > NAAQS	74	0	0	32	3	0	0	0	6			
Average (µg/m3)	68	30	37	54	39	39	35	40	44			
Days in AQI Scale (PM2.5 in μg/m3)												
Good (0-30)	0	15	5	1	7	7	8	1	3			
Satisfactory (31-60)	8	16	26	20	23	24	23	30	26			
Moderate (61-90)	22	0	0	10	1	0	0	0	2			
Poor (91-120)	2	0	0	0	0	0	0	0	0			
Very Poor (121-250)	0	0	0	0	0	0	0	0	0			
Severe (>250)	0	0	0	0	0	0	0	0	0			

#### Ambient air quality status in Kolkata – January 2024 (PM<sub>2.5</sub> concentration, μg/m³)



Year						Jan-24						
Monitored Days	31	31	31	31	31	31						
Days > NAAQS	31	27	31	30	30	30						
% days > NAAQS	100	87	100	97	97	97						
Average (µg/m3)	202	95	128	98	102	99						
	Days in AQI Scale (PM2.5 in μg/m3)											
Good (0-30)	0	0	0	0	0	0						
Satisfactory (31-60)	0	4	0	1	1	1						
Moderate (61-90)	0	12	1	9	9	8						
Poor (91-120)	4	10	11	16	14	19						
Very Poor (121-250)	18	5	19	5	7	3						
Severe (>250)	9	0	0	0	0	0						

#### **Data sources**

Ambient air quality data recorded by **Continuous Ambient Air Quality Monitoring Stations** (CAAQMS) is downloaded from the 'Central Control Room for Air Quality Management - All India' dashboard operated by the Central Pollution Control Board (CPCB).

#### Resources

To subscribe to these monthly air quality snapshots and to access the graphs and web version of this snapshot on our website here- <u>India monthly ambient air</u> <u>quality snapshot: January 2024</u>