

AIR PO

ASSESSMENT OF
AIR POLLUTION
IN INDIAN CITIES
and **NATIONAL CLEAN AIR PROGRAMME (NCAP)**

GREENPEACE
ग्रीनपीस

 **CLEAN AIR
NATION**

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Airpocalypse III: Assessment of Air Pollution in Indian Cities And National Clean Air Programme (NCAP)

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Published by GPET, released in January 2019

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To implement the goals and targets of the NCAP, far more specific and binding regulation and budgetary allocations will be required – good intentions are not enough.

EXECUTIVE SUMMARY

The year 2018 was significant in terms of the debate on air pollution and what action must be taken to combat the health crisis facing India. The year between the announcement of a National Clean Air Programme (NCAP) and the release of the final version by the MoEFCC on 10th January 2019 saw many conversations, debates and publications on the potential actions to be taken. The draft NCAP which came out in May 2018 and the World Health Organisation (WHO) ambient air quality database highlighting that 14 out of 15 most polluted cities across the world are in India acted as a catalyst to the debate. The updated data published by the WHO showed that the gap between Beijing (China) and New Delhi (India) seems to be widening as Beijing has seen consistent improvements in air quality while Delhi has suffered from deteriorating air quality. In fact, even a coastal city like Mumbai is now more polluted than Beijing - a frightening reminder of the lack of seriousness the country's political machinery is showing towards solving the issue.

Towards the end of 2018, the India State-Level Disease Burden Initiative was released by the Indian Council of Medical Research (ICMR). This is a joint initiative of the ICMR, Public Health Foundation of India (PHFI), and Institute for Health Metrics and Evaluation (IHME) in collaboration with the Ministry of Health and Family Welfare, Government of India, along with experts and stakeholders associated with over 100 Indian institutions. The paper's highlights included:

- 1. This is the first comprehensive estimates of deaths, disease burden, and life expectancy reduction associated with air pollution in each state of India.**
- 2. One in eight deaths in India was attributable to air pollution in 2017, making it a leading risk factor for death.**
- 3. There were 6.7 lakh (670,000) deaths due to outdoor particulate matter air pollution and 4.8 (480,000) lakh deaths due to household air pollution.**
- 4. With 18% of the global population, India suffered 26% of premature mortality and health loss attributable to air pollution globally.**
- 5. In 2017, 77% population of India was exposed to ambient particulate matter $PM_{2.5}$ above $40\mu g/m^3$, the recommended limit by the National Ambient Air Quality Standards (NAAQS), and four times as high as the WHO guideline.**

In January 2019, the final National Clean Air Programme was announced. The NCAP acknowledges the widespread health emergency facing the country, specifies sectoral initiatives and offers tentative targets of 20 – 30% reduction of air pollution levels by 2024. However, the NCAP lacks legal backing, clear sectoral targets and budgets that will enable the state to implement the plan.

Against this background, this report Airpocalypse III now highlights that:

- 1. Out of 313 cities whose 2017 annual air quality data was analysed, 241 cities/towns (77%) had PM_{10} levels beyond the NAAQS prescribed by Central Pollution Control Board (CPCB), putting all these cities/towns in the “non-attainment” list. This is more than double the original 102 non-attainment cities initially identified by the MoEF&CC in based on NAMP (National Ambient Air Quality Monitoring Programme) air quality data till 2015 and recent database released by WHO in May 2018.**
- 2. The NCAP aims to reduce pollution levels by 20-30% in 102 non-attainment cities. Assuming that all non-attainment (241) cities will achieve a 30% reduction by 2024, we will still be left with 152 cities/towns which will have PM_{10} levels above the NAAQS in 2024 and belong on the list of non-attainment cities/towns.**
- 3. Among the 139 cities that have PM_{10} levels (recorded in 2017) above NAAQS but have not been included in the non-attainment list under the NCAP, there are several cities that have a population of more than 1 million. These cities are: Ranchi, Dhanbad (Jharkhand); Jabalpur (Madhya Pradesh); Chennai, Madurai (Tamil Nadu); Meerut (Uttar Pradesh); Pimpri-Chindwar, Thane, (Maharashtra); Surat, Rajkot, Vadodara (Gujarat); Howrah (West Bengal) etc.**
- 4. The NCAP also mentions that the list of 102 non-attainment cities includes 43 cities identified under Smart Cities programme. However, when the list of smart cities was compared to the list of 313 cities with 2017 annual PM_{10} data, 65 smart cities were found to be in the “non-attainment” category. Another 20 smart cities did not have publicly available data on Air Quality. Only 12 cities identified under Smart Cities programme had PM_{10} levels below $60\mu g/m^3$ which is annual standard for PM_{10} prescribed by CPCB under NAAQS.**
- 5. Crucially, based on 2017 data, this report shows that 152 cities have air pollution levels so high that even a 30% reduction will still leave them with air quality worse than the NAAQS, and much worse than the WHO standards. Clearly, 30% is a start but further reductions will be necessary.**

INTRODUCTION

2017 is also the NCAP base year for the pollution reduction targets of 20-30% across 102 cities by 2024 and so this report will serve as a base to gauge the efficacy of pollution reduction action going forward.

In April 2018, the MoEF&CC released a draft national plan to curb air pollution levels, and after eight months of wait, on 10th January 2019 it was released in the final form.

In January 2017 Greenpeace India published the first version of this report titled as “Airpocalypse”, to show with hard data that air pollution is a growing national problem and it needs to be addressed with utmost seriousness at a countrywide level and not only in Delhi or the National Capital Region as had been the case until recently. The report also identified major sources of pollution in different parts of the country based on past research and available data, and suggested solutions for the air pollution crisis at the all-India level, with an emphasis on the short-term, more immediate solutions based on the extent, degree and levels of pollution afflicting specific regions¹.

The second version of the report “Airpocalypse II” released in January 2018 highlighted the urgency of the rising health crisis caused by hazardous air pollution levels across the country. It had updated data for the year 2016 for approximately 158 cities. Wherever data was not available for 2016, older data from 2015 was used to assess where cities stood in terms of air quality. This report had annual PM₁₀ levels for 280 cities and towns across the country as compared to the 168 cities in the earlier version. The data showed that 228 cities (more than 80% of the cities/town where Air Quality Monitoring data was available), were not complying with the annual permissible concentration of 60 µg/m³ which was prescribed by the Central Pollution Control Board (CPCB) under the National Ambient Air Quality Standards (NAAQS) for PM₁₀ and none of the cities were found to adhere to the standard set by the World Health Organization (WHO) at 20 µg/m³. The report highlighted that out of the 630 million Indians covered by the data, 550 million lived in areas exceeding national standard for PM10 which includes 47 million children under the age of 5.

The data presented by the Airpocalypse reports as well as numerous other reports by Central and State Pollution Control Boards, IITs and other research institutes, together with widespread campaigning, research and mobilisation by civil society organisations, academia, medical professionals and government officials raised the level of debate and urgency in 2018. The demand grew for a concrete solution to pollution through the formulation of a National Clean Air Action Plan at the national and regional level with time bound pollution reduction targets and a sectoral approach to achieve breathable air across the country. In April 2018, the MoEF&CC released a draft national plan to curb air pollution levels, and after eight months of wait, on 10th January 2019 it was released in the final form.

In this report, called “Airpocalypse-III”, we analyse updated annual data for the year 2017 for cities/towns across the country to find out the spread and intensity of the air pollution crisis. 2017 is also the NCAP base year for the pollution reduction targets of 20-30% across 102 cities by 2024 and so

¹ “Directions Issued to SPCBs under section 18 (1)(b) of Air (Prevention and Control of Pollution) Act, 1981 regarding prevention & control of air pollution in non attainment cities and towns in the year 2016” at <http://cpcb.nic.in/directions-spcb-18-1-b/>



As on 20th January 2019, the network consists of 731 operating stations covering 312 cities/towns in 29 states and 6 Union Territories of the country. Greenpeace India attempted to collect data on PM₁₀ levels for these NAMP stations spread across the country (because the data for PM_{2.5} was limited to very few cities and places, it would not have been enough to see the extent of the spread of pollution levels across the country) from CPCB and SPCBs. Most of the annual data was made available by CPCB on their website for the year 2017. Along with the online data made available from CPCB, online data from SPCBs and data collected through RTI for SAMP stations and CAAQMS was inserted for the missing cities to cover maximum location with monitoring data.

There are lots of challenges with respect to relying on government data on air quality due to various factors, the primary one being that the majority of the measurements are taken manually, raising questions about the quality of the data. The other factor is the location of monitoring stations and data collection from them in the case of far flung and remote areas. The stations often become dysfunctional for long periods of time making the average values somewhat skewed. Geographies like Korba in Chhattisgarh, Cuddalore in Tamil Nadu and Nanded in Maharashtra show PM₁₀ levels below NAAQS possibly because of such factors.

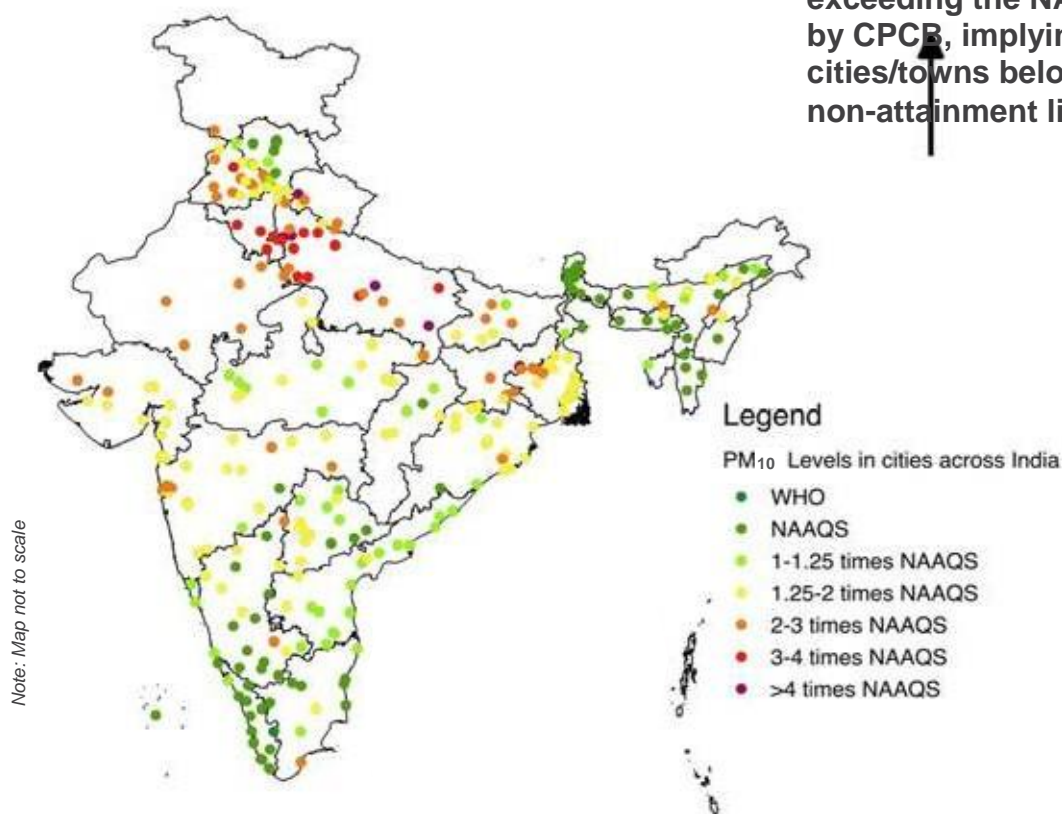
Although the data is definitely sufficient to prove that air quality is poor across the country in almost all states by the government's own readings and to prove the need to expand real time air quality monitoring, it will be necessary to use satellite data to complement and validate ground measurements; and to establish an independent regulator to ascertain data quality and to standardise the reading across the country.

National Air Quality Monitoring Programme (NAMP)

by Central Pollution Control Board monitors three major air pollutants viz., Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) and Particulate Matter size equal to or less than 10 micron (PM₁₀) along with metrological parameters, across the country.

INFERENCE AND ANALYSIS

Figure: PM₁₀ levels across cities in India (2017)



The data availability through NAMP till 2016 was very limited, covering only 342 operating stations in 127 cities/towns across the 26 states and 4 Union Territories of the country. As of January 20, 2019, India has 731 operating stations covering 312 cities/towns in 29 states and 6 Union Territories.

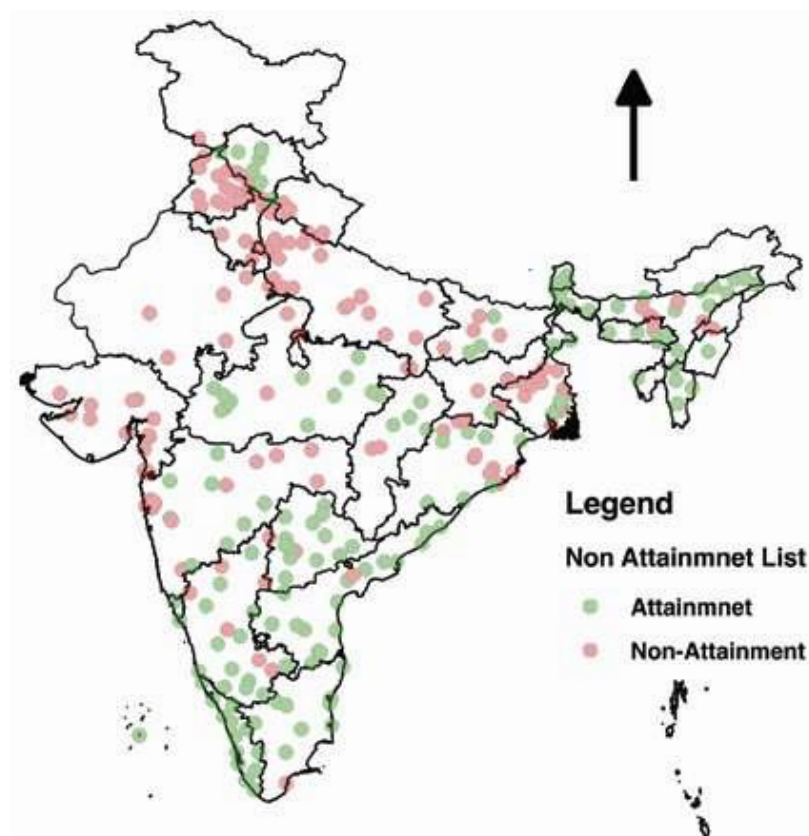
The impact of limited data coverage in 2015 resulted in the number of non-attainment cities/towns included in the National Clean Air Programme (NCAP) being limited to 102. The expansion of air quality monitoring under NAMP to 185 new cities/towns post 2015 presented a more worrisome picture: based on 2017 annual average PM₁₀ levels, 241 cities/towns (out of 313 where data was available) were found to be in the non-attainment category.

On January 10, 2019, the Ministry of Environment Forest and Climate Change on 10th January 2019, released the National Clean Air Programme with a target of reducing pollution levels by 20-30% in 102 non attainment cities. However, even if we assume that all the cities will aim for a 30% reduction of pollution levels by 2024, we will still be left with 152 cities/towns which will have PM₁₀ levels above the NAAQS (2017 annual data) and thus qualify as Non-attainment cities/towns.

Of the 139 cities that have not been included in the non-attainment list under the NCAP, there are several cities that have a population of more than 1 million, and PM₁₀ levels (recorded in 2017) above NAAQS. These cities are: Ranchi, Dhanbad (Jharkhand); Jabalpur (Madhya Pradesh); Chennai, Madurai (Tamil Nadu); Meerut (Uttar Pradesh); Pimpri-Chindwar, Thane, (Maharashtra); Surat, Rajkot, Vadodara (Gujarat); Howrah (West Bengal) etc. Since the data for 2017 was available when NCAP was finalised, it would have made more sense to update the non-attainment list to include all such cities in the final NCAP.

The NCAP also mentions that the list of 102 non-attainment cities includes 43 cities identified under Smart Cities programme. A comparison of the list of smart cities with the list of 313 cities with 2017 annual PM₁₀ data, shows that there are in fact 65 smart cities that should fall in the non-attainment list. There are an additional 20 Smart Cities for which data on Air Quality was not available. Only 12 Smart Cities had PM₁₀ levels below 60 µg/m³ which is the annual standard for PM₁₀ prescribed by CPCB under NAAQS.

* Non Attainment city here is defined as a city which had 2017 annual PM₁₀ levels above the prescribed limits under NAAQS by CPCB (60 µg/m³).



Government's Initiative

National Clean Air Programme (NCAP) in its current form and ambition is only a good first step on a long journey. For the first step to be meaningful it must be followed by other measures and several lacunae must be addressed. These include:

- 1. The NCAP is not notified under any Act {The Environment (Protection) Act 1986 or The Air (Prevention and Control of Pollution) Act 1981} and is only being seen as a guiding document. To make the NCAP effective in achieving breathable air quality across the country, the air quality targets and specific measures identified in the document must be given a proper legal status. The experience of the GRAP (Graded Response Action Plan), CAP (Comprehensive Action Plan) for Delhi and Emission standards for coal based power plants show that implementation is a key challenge. The NCAP should be given stringent provisions making it legally binding on both authorities and polluters to cut down on pollution.**
- 2. Crucially, the current ambition levels under NCAP (20-30% air pollution reduction by 2024) will not lead to breathable air quality in the country, as the pollution levels across much of the country are so high that even a 30% reduction will still leave pollution levels above the NAAQS across the country, not to mention the WHO standards.**
- 3. The NCAP being a dynamic document must set specific city-wise pollution reduction targets rather than just providing a tentative window of 20-30% reduction across the board by 2024.**
- 4. NCAP should also express the ambition to move to NAAQS in a time bound manner first and then should have timeline to move towards the WHO guidelines. Tentative percent reduction targets over the next 5 years are insufficient without a longer term timeline to achieve breathable air quality and attain the health benefits of reducing pollution levels below NAAQS and WHO standards. Minor reductions from current hazardous levels might not be able to help us achieve great health benefits because concentrations even as low as 10 $\mu\text{g}/\text{m}^3$ for PM_{10} and 6 $\mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$ impacts human health².**
- 5. To achieve the air quality goals, much stronger sectoral policies and targets will be needed on the national and state level. Pollution across the country originates from the same key sectors – industry and power plants, household fuels, waste burning, crop burning and transport – with variance in proportions. Furthermore, much of the pollution levels in the identified non-attainment cities originates from outside the city limits. The obvious question which arises is, “What is the use of conducting 102 source apportionment studies for non-attainment cities if there are no sectoral targets and policies for emission reductions?”**
- 6. With regard to sectoral targets, the NCAP has not incorporated any learning from the New Delhi experience: having conducted various recent source apportionment studies, Delhi had the basis to include sectoral pollution/emission reduction targets as well as very specific pollution reduction targets.**

The Government must prioritise transparency, accountability and stringency in the actions proposed under NCAP while strengthening it over the next few months. Inclusion of legal provisions and sectoral targets is key to implementation and effectiveness of air pollution reduction plans. NCAP should be treated as a dynamic document that can be improved into a stronger instrument to achieve the dream of blue skies and clean air across India.

² “The theoretical minimum risk exposure level for ambient particulate matter and household air pollution was defined as a population-weighted mean $\text{PM}_{2.5}$ between 2.4 and 5.9 $\mu\text{g}/\text{m}^3$, except for the attribution of cataract to household air pollution for which the theoretical minimum risk exposure level was defined as no exposure to solid fuel use for cooking.” GBD 2017 Risk Factor Collaborators. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2018; 392: 1923–94.

People's Initiative

Public participation is critical in the fight against air pollution. Making our voices heard in the corridors of power, letting our leaders know that the status quo is unacceptable and that we as a nation want clean air as essential to achieving progress. The devastating toll that air pollution is taking on the quality of life of just about every section of society, but in particular children and the elderly ensures that inaction is not an option. The right to clean air is in fact the right to life and political parties must be queried on their plans to deliver clean air for India.

In addition, our own choices for electricity and transportation and our advocacy for clean options on these fronts will play a major role in managing pollution levels in many parts of the country:

- 1. Supporting rooftop solar and other forms of decentralised renewable energy solutions that reduce the demand for coal-based electricity.**
- 2. Increased usage of public transport, cycling and walking.**
- 3. Using energy efficient appliances and reducing household energy usage.**
- 4. Waste minimisation, segregation and recycling, which will reduce burning of waste in streets as well as at landfills, along with energy reductions and saving in transporting huge quantities of waste.**
- 5. Most importantly, the citizens while making sure their lifestyle and activities move towards minimum pollution footprint, should make sure that they unite and demand their right to breathe clean air. Campaigns such as #NoSaansNoVote (#NoBreatheNoVote) should become so powerful that political parties are forced to put clean air and the fight against air pollution at the top of their political agenda.**
- 6. As most citizens live in areas where air pollution is a severe threat to personal health, using and promoting the use of personal protection measures – air purifiers and certified face masks (N95 or FFP2 standard) helps reduce damage to personal health, while increasing the visibility and recognition of the issue.**

APPENDIX

Annual PM 10 level since 2013 across cities/towns across India (NMAP stations) with calculated PM10 levels for 2024 based on 30% reduction as mentioned under NCAP

STATE	CITY	2013	2014	2015	2016	2017	Remark	2024 (calculated with 30% reduction over 2017 levels)
Jharkhand	Jharia	193	237	231	280	295		207
Haryana	Gurgaon					285	PM2.5 Based on Monthly Data (134), Assuming 47% of PM10 being PM2.5	200
Uttar Pradesh	Ghaziabad	285	242	260	236	281		196
Uttar Pradesh	Hapur					254	Based on Monthly Data	178
Uttarakhand	Dehradun	158	165	188	241	248		174
Uttar Pradesh	Lucknow	192	174	169	214	246		172
Uttar Pradesh	Varanasi	145	140	145	256	244		171
Delhi	Delhi	219	217	220	276	240		168
Jharkhand	Dhanbad	157	166	168	226	238		167
Uttar Pradesh	Kanpur	201	200	196	217	224		157
Punjab	Jalandhar	164	144	151	186	223	The Monthly data suggests 2017 average at 173	156
Haryana	Hissar	100	NA	NA	NA	220		154
Uttar Pradesh	Firozabad	246	146	195	223	220		154
Uttar Pradesh	Moradabad	160	201	169	196	217		152
Uttar Pradesh	Noida	142	136	154	176	216		151
Uttar Pradesh	Khurja	163	158	167	216	209		146
Uttar Pradesh	Gajraula	137	179	177	193	207		145
Rajasthan	Bhijwadi	NA	NA	NA	264	200		140
Haryana	Rohtak					200	PM2.5 Based on Monthly Data (134), Assuming 47% of PM10 being PM2.7	140
Uttar Pradesh	Barolilly	232	239	241	253	195		137
Uttar Pradesh	Gorakhpur	NA	NA	139	154	186		130
Uttar Pradesh	Agra	192	178	186	198	185		129
Rajasthan	Jodhpur	176	190	152	168	180		126
Rajasthan	Jalpur	161	150	171	199	177		124
Maharashtra	Dombivli (Kalyan Dombivli)	92	141	104	128	176		123
Meghalaya	Byrnihat	122	136	122	175	174		122
Uttar Pradesh	Saharanpur	NA	NA	NA	218	174		121
Himachal Pradesh	Baddi	118	109	102	90	172		121
Punjab	Amritsar	181	190	148	194	168		118
Bihar	Muzaffarpur	NA	NA	NA	NA	167		117
Maharashtra	Ambarnath					165	Based on Monthly Data	116
Rajasthan	Bharatpur	NA	NA	NA	159	163		114
West Bengal	Asansol	160	85	97	211	163		114
Punjab	Ludhiana	204	146	139	139	162		113
Maharashtra	Badlapur	84	122	105	125	159		111
Uttar Pradesh	Renusagar/Sonbhadra					159	Based on Monthly Data	111
Jharkhand	Sindri	121	100	75	143	158		111
Bihar	Patna	NA	178	204	212	157		110
West Bengal	Durgapur	160	102	101	196	155		108
Uttar Pradesh	Mathura	NA	NA	NA	171	154		108
Uttar Pradesh	Anpara/ Sonbhadra	133	131	137	132	154		107
Uttar Pradesh	Meerut	135	155	NA	158	153		107
Maharashtra	Mumbai	118	96	106	119	151		106
Maharashtra	Ulhasnagar	75	107	107	118	150		105
Jammu & Kashmir	Jammu	118	123	125	131	149		104
Himachal Pradesh	Nalagarh	110	109	89	108	147		103
West Bengal	Raniganj	163	134	114	217	147		103
Maharashtra	Chandrapur	131	129	102	111	146		102

STATE	CITY	2013	2014	2015	2016	2017	Remark	2024 (calculated with 30% reduction over 2017 levels)
Jharkhand	Ranchi	177	197	220	196	142		99
Uttar Pradesh	Rai Bareilly	177	160	157	141	141		98
Uttar Pradesh	Alahabad	235	250	252	195	140		98
Punjab	Khanna	183	161	122	114	139		97
Nagaland	Dimapur	101	129	122	122	138		97
Punjab	Mandi Gobindgarh	165	135	129	124	136		95
Rajasthan	Alwar	268	240	180	144	134		94
Tamil Nadu	Thoothukudi/ Tuticorin	77	83	91	175	132		93
Jharkhand	Sarakela Kharsawan	NA	NA	142	143	131		92
Punjab	Barnala					131	Based on Monthly Data	92
Punjab	Bathinda	130	122	158	121	131		92
Jharkhand	Jamshedpur	135	NA	134	136	131		91
Rajasthan	Kota	123	127	133	110	131		91
Uttarakhand	Haldwani	144	149	138	128	129		90
Uttarakhand	Rishikesh	113	122	121	119	128		90
Gujarat	Morbi					127	Based on Monthly Data	89
Karnataka	Bidar	67	62	59	NA	127		89
Maharashtra	Akola	133	135	128	126	127		89
Bihar	Begusarai	NA	NA	NA	NA	126		88
Odisha	Kalinga Nagar	83	94	100	113	126		88
Uttarakhand	Rudrapur	156	139	125	142	126		88
Rajasthan	Udaipur	142	112	156	137	125		88
Karnataka	Timukuru	NA	117	134	136	125		88
Maharashtra	Thane	110	109	117	122	125		88
Uttar Pradesh	Unnao	114	74	120	120	125		88
Punjab	Feridkot	NA	74	90	104	124		87
Gujarat	Bhuj					122	Based on Monthly Data	85
Gujarat	Ahmedabad	84	85	89	108	120		84
Odisha	Rajgangpur					120	Based on Monthly Data	84
West Bengal	Kolkata	182	122	105	113	120		84
Himachal Pradesh	Kala Amb	144	139	119	129	119		83
Odisha	Rourkela	97	82	100	NA	117		82
Gujarat	Sanand					116	Based on Monthly Data	81
Punjab	Sri Muktsar Sahib					116	Based on Monthly Data	81
Punjab	SBS Nagar					116	Based on Monthly Data	81
Haryana	Panchkula					115	PM2.5 Based on Monthly Data (134), Assuming 47% of PM10 being PM2.5	81
Gujarat	Vapi	94	93	88	105	114		80
Nagaland	Kohima	85	91	94	90	114		80
Gujarat	Sarigam					113	Based on Monthly Data	79
Uttar Pradesh	Jhansi	101	106	119	116	113		79
Gujarat	Bharuch					111	Based on Monthly Data	78
Punjab	Hoshiarpur	NA	55	72	NA	111		78
Uttarakhand	Kashipur	151	121	107	126	111		78
West Bengal	Howrah	187	111	123	119	110		77
Dadra & Nagar Haveli	Silvassa	44	NA	89	37	110		77
Madhya Pradesh	Gwalior	197	144	125	96	110		77
Meghalaya	Umsning	NA	NA	84	108	110		77
West Bengal	Baharampur	NA	NA	NA	NA	109		76
Chandigarh	Chandigarh	102	91	86	105	109		76
Madhya Pradesh	Singrauli	NA	NA	90	83	109		76
Gujarat	Vadodara	88	87	87	93	108		76
Assam	Tezpur	120	71	90	68	108		76
Maharashtra	Panvel					108	Based on Monthly Data	76
Gujarat	Ankleshwar	86	89	88	104	108		75

STATE	CITY	2013	2014	2015	2016	2017	Remark	2024 (calculated with 30% reduction over 2017 levels)
Telangana	Hyderabad	88	95	93	101	108		75
Gujarat	Rajkot	87	82	84	93	107		75
Gujarat	Surat	88	89	88	92	106		74
Daman and Diu	Daman & Diu	44	NA	83	34	106		74
Uttarakhand	Haridwar	119	127	123	129	106		74
Assam	Guwahati	141	88	97	105	106		74
Maharashtra	Amravati	88	107	108	100	106		74
Odisha	Paradeep	56	90	108	112	106		74
Gujarat	Bhavnagar					105	Based on Monthly Data	74
Maharashtra	Navi Mumbai	135	151	125	118	105		74
Gujarat	Jamnagar	90	85	84	92	104		73
Haryana	Yamunanagar	153	68	NA	NA	104		73
Chhattisgarh	Raipur	305	329	189	148	103		72
West Bengal	Barasat	NA	NA	NA	NA	103		72
West Bengal	Ranaghat	NA	NA	NA	NA	103		72
Maharashtra	Pune	87	92	99	107	102		71
Maharashtra	Nagpur	97	103	90	118	102		71
Punjab	Patiala	108	104	110	106	102		71
Maharashtra	Jalna	122	137	118	110	101		71
Maharashtra	Taloja					100	Based on Monthly Data	70
Andhra Pradesh	Vijayawada	104	100	110	102	99		70
Punjab	Fategarh Sahib					98	Based on Monthly Data	69
Chhattisgarh	Bhilai	106	108	109	108	97		68
West Bengal	Haldia	146	136	87	103	97		68
Odisha	Talcher	110	125	136	105	96		67
Assam	Nalbari	140	76	120	108	95		67
Karnataka	Belgaum	74	76	64	112	95		67
Punjab	Sangrur	97	88	100	90	95		67
Odisha	Angul	107	116	103	97	95		66
Karnataka	Bijapur	NA	150	99	93	94		66
Odisha	Konark	63	70	88	95	94		66
West Bengal	Krishnanagar	NA	NA	NA	NA	93		65
Madhya Pradesh	Bhopal	222	159	158	89	93		65
Punjab	Dera Bassi	129	113	96	98	93		65
Karnataka	Raichur	79	112	92	83	92		64
West Bengal	Bankura	NA	NA	NA	NA	92		64
West Bengal	Bolpur	NA	NA	NA	NA	92		64
West Bengal	Rampurhat	NA	NA	NA	NA	92		64
West Bengal	Surf	NA	NA	NA	NA	92		64
Karnataka	Bangalore	110	139	119	103	92		64
Odisha	Bhubaneswar	87	90	81	105	91		64
West Bengal	Rishra	NA	NA	NA	NA	91		64
Punjab	Naya Nangal	86	85	84	91	91		63
Maharashtra	Kolhapur	113	99	98	96	90		63
Punjab	Dera Baba Nanak	76	68	77	89	90		63
West Bengal	Barrackpore	166	103	113	106	90		63
Odisha	Jharsuguda	NA	112	NA	87	90		63
Bihar	Sasaram	NA	NA	NA	NA	87		61
Karnataka	Devanagere	91	85	109	94	87		61
Odisha	Cuttack	83	93	81	81	87		61
Tamil Nadu	Trichy	87	84	85	95	86		60
Madhya Pradesh	Katni	NA	NA	NA	69	86		60
Madhya Pradesh	Pithampur	NA	NA	120	93	85		60
West Bengal	Kalyani	NA	NA	NA	NA	85		60
Bihar	Rajgir	NA	NA	NA	NA	84		59
Himachal Pradesh	Paonta Sahib	120	129	117	102	84		59

STATE	CITY	2013	2014	2015	2016	2017	Remark	2024 (calculated with 30% reduction over 2017 levels)
Odisha	Balasure	88	87	82	85	83		58
West Bengal	Chinsura	NA	NA	NA	NA	83		58
Maharashtra	Aurangabad	84	85	83	92	83		58
Andhra Pradesh	Kurnool	76	77	82	69	82		57
Madhya Pradesh	Amlai/Shahdol	NA	NA	64	73	82		57
Maharashtra	Pimpri-Chinchwad	86	93	102	105	82		57
Odisha	Sambalpur	51	55	77	79	82		57
Assam	Sivasagar	121	90	71	75	81		57
Madhya Pradesh	Shahdol					81	Based on Monthly Data	57
Maharashtra	Nashik	85	72	78	85	81		57
Maharashtra	Latur	97	91	79	81	81		56
Madhya Pradesh	Indore	154	143	97	95	80		56
Madhya Pradesh	Satna	NA	163	125	71	80		56
Telangana	Kothur	NA	NA	106	78	80		56
Telangana	Mahaboobnagar					80	Based on Monthly Data	56
Telangana	Medak					80	Based on Monthly Data	56
Chhattisgarh	Raigarh	NA	NA	NA	NA	80		56
Karnataka	Hubli	96	91	75	84	79		55
West Bengal	Tribeni	NA	NA	NA	NA	79		55
West Bengal	Uluberia	NA	NA	NA	NA	79		55
Telangana	Sangareddy	NA	NA	70	70	79		55
Andhra Pradesh	Anantapur	70	76	88	85	78		55
Telangana	Patancheru	91	95	85	78	78		55
West Bengal	Sankrail	NA	NA	NA	88	78		54
Bihar	Gaya	NA	NA	NA	NA	77		54
Jharkhand	West Singhbhum	NA	NA	111	93	77		54
Maharashtra	Jalgaon	131	116	108	103	77		54
West Bengal	Dankuni	NA	NA	NA	NA	77		54
Odisha	Puri	64	67	94	94	77		54
Arunachal Pradesh	Naharlagun	NA	64	70	NA	76		53
Odisha	Keonjhar					76	Based on Monthly Data	53
Telangana	Ramagundam	84	55	67	69	76		53
Maharashtra	Sangli	76	100	77	83	76		53
Madhya Pradesh	Ujjain	79	97	93	90	75		53
Andhra Pradesh	Tirumala					75	Based on Monthly Data	53
Assam	Nagaon	132	100	137	111	75		53
Chhattisgarh	Bilaspur	115	101	99	97	75		53
Karnataka	Mangalore	32	32	36	40	75		53
Madhya Pradesh	Dewas	101	93	90	89	75		52
Andhra Pradesh	Eluru	115	121	77	70	74		52
Andhra Pradesh	Kadapa	70	78	70	68	74		52
Andhra Pradesh	Yerraguntla					74	Based on Monthly Data	52
Madhya Pradesh	Jabalpur	69	73	91	71	74		52
Andhra Pradesh	Visakhapatnam	68	64	61	77	73		51
Karnataka	Karwar	NA	NA	NA	NA	73		51
Himachal Pradesh	Sunder Nagar	78	87	83	92	73		51
Andhra Pradesh	Vizianagaram	63	69	74	85	72		50
Bihar	Darbhanga	NA	NA	NA	NA	72		50
Telangana	Karimnagar	65	61	64	60	72		50
Madhya Pradesh	Nagda	105	69	56	64	71		50
Assam	Tinsukia	99	57	119	80	70		49
Andhra Pradesh	Srikakulam	76	69	73	71	70		49
Telangana	Warangal	50	52	58	70	70		49
Madhya Pradesh	Sagar	156	161	103	79	70		49
Andhra Pradesh	Guntur	75	79	100	88	69		48
Assam	Daranga	98	70	69	71	69		48

STATE	CITY	2013	2014	2015	2016	2017	Remark	2024 (calculated with 30% reduction over 2017 levels)
Andhra Pradesh	Chittoor	51	65	67	62	69		48
Karnataka	Kolar	47	67	75	62	68		48
Maharashtra	Bhiwandi	NA	NA	NA	66	68		48
Maharashtra	Kalyan					68	Based on Monthly Data	48
Goa	Panji (Goa)	55	63	62	72	67		47
Tamil Nadu	Madurai	41	46	64	76	67		47
Andhra Pradesh	Kakinada	59	56	62	64	66		46
Himachal Pradesh	Una	93	77	81	70	66		46
Andhra Pradesh	Nellore	62	63	66	66	65		46
Andhra Pradesh	Ongole	64	63	67	65	65		46
Andhra Pradesh	Rajahmundry	68	64	62	64	65		46
Himachal Pradesh	Parwanoo	69	67	61	70	65		46
Madhya Pradesh	Chhindwara	NA	NA	85	80	65		46
Odisha	Bonaigarh					65	Based on Monthly Data	46
Telangana	Adilabad	61	67	NA	63	65		46
Chhattisgarh	Sarguja					64	Based on Monthly Data	45
Kerala	Kannur					64	Based on Monthly Data	45
Maharashtra	Solapur	83	76	75	74	64		45
Andhra Pradesh	Tirupati	44	NA	62	59	63		44
Arunachal Pradesh	Itanagar	NA	75	91	NA	63		44
Himachal Pradesh	Damtal	87	97	106	85	63		44
Assam	Lakhimpur	121	66	78	84	62		43
Telangana	Nizamabad	56	62	NA	63	62		43
West Bengal	Malda	NA	NA	NA	NA	62		43
Tamil Nadu	Chennai	73	57	59	65	62		43
Tripura	Agartala	NA	NA	NA	NA	62		43
Odisha	Berhampur	75	72	54	58	61		43
Assam	Margherita	77	55	115	76	60		42
Telangana	Nalgonda	72	94	76	62	60		42
Assam	Bongaigaon	45	51	46	56	59		41
Karnataka	Chamarajanagar					59	Based on Monthly Data	41
Telangana	Kothagudem					59	Based on Monthly Data	41
West Bengal	Siliguri	NA	NA	NA	NA	59		41
Assam	Dibrugarh	99	44	109	81	58		41
Chhattisgarh	Korba	77	72	66	58	58		41
Odisha	Rayagada	50	52	50	59	58		41
Kerala	Alappuzha	48	77	45	43	58		40
Karnataka	Bellary					57	Based on Monthly Data	40
West Bengal	Coochbehar	NA	NA	NA	NA	57		40
Assam	Golaghat	101	63	124	83	56		39
Karnataka	Kalaburgi					56	Based on Monthly Data	39
Kerala	Thrissur	46	55	48	54	56		39
West Bengal	Darjeeling	NA	NA	NA	NA	56		39
Telangana	Khammam	63	67	60	55	55		39
Karnataka	Bagalkote	NA	NA	NA	59	54		38
Karnataka	Gulbarga	88	77	95	NA	54		38
Sikkim	Rangpo	NA	NA	NA	54	53		37
West Bengal	Jalpaiguri	NA	NA	NA	NA	53		37
Karnataka	Mysore	60	57	48	47	53		37
Tamil Nadu	Salem	62	63	54	51	52		36
Mizoram	Aizawl	49	43	44	60	52		36
Kerala	Alappuzha					51	Based on Monthly Data	36
Sikkim	Singtam	NA	NA	NA	44	51		36
Kerala	Kochi	76	68	41	48	51		36
Tamil Nadu	Cuddalore	49	62	57	48	51		35
Himachal Pradesh	Shimla	47	48	55	54	50		35

STATE	CITY	2013	2014	2015	2016	2017	Remark	2024 (calculated with 30% reduction over 2017 levels)
Kerala	Kottayam	71	61	60	54	50		35
Kerala	Thiruvananthapuram	54	51	55	53	49		34
Assam	Silcher	135	80	72	58	49		34
Tamil Nadu	Coimbatore	56	49	47	59	49		34
Kerala	Kozhikode	48	46	49	51	47		33
Karnataka	Chitradurg	29	38	47	41	46		32
West Bengal	Balurghat	NA	NA	NA	NA	46		32
Karnataka	Mandya	43	43	42	20	45		32
Kerala	Palakkad	39	39	47	41	44		31
Meghalaya	Khliehriat	36	42	36	47	44		31
Himachal Pradesh	Manali	48	40	47	52	44		30
Himachal Pradesh	Kullu					43	Based on Monthly Data	30
Kerala	Kollam	36	35	47	46	43		30
Kerala	Wayanad	42	36	37	39	43		30
Puducherry	Karaikal	NA	35	35	38	43		30
Maharashtra	Nanded	63	109	168	161	42		30
Tamil Nadu	Mettur	58	53	49	53	42		29
Puducherry	Pondicherry	43	42	35	40	41		28
Sikkim	Gangtok	NA	NA	NA	28	40		28
Meghalaya	Shillong	65	64	60	56	39		27
Meghalaya	Tura	38	38	30	31	38		27
Karnataka	Kodagu					37	Based on Monthly Data	26
Himachal Pradesh	Dharamshala	NA	32	37	42	36		25
Karnataka	Shimoga	51	42	36	42	36		25
Kerala	Kasargod					36	Based on Monthly Data	25
Meghalaya	Nongstoin	24	28	26	33	36		25
Himachal Pradesh	Vashisht	NA	NA	NA	NA	35		25
Lakshwadeep	Kavaratti	NA	NA	NA	30	33		23
Kerala	Malappuram	37	43	44	37	32		22
Karnataka	Hassan	26	25	25	26	31		22
Mizoram	Kolasib	42	36	34	30	30		21
Manspur	Imphal	NA	NA	NA	29	29		20
Himachal Pradesh	Gulaba	NA	NA	NA	NA	28		20
Kerala	Pathanamthitta	24	22	25	26	28		20
Meghalaya	Dawki	42	44	36	35	28		20
Sikkim	Mangan	NA	NA	NA	20	28		20
Mizoram	Champhai	58	46	34	30	25		18
Mizoram	Lunglei	47	48	43	33	25		17
Sikkim	Namchi	NA	NA	NA	23	24		17
Sikkim	Chungthang	NA	NA	NA	26	23		16
Sikkim	Ravangla	NA	NA	NA	22	23		16
Sikkim	Pelling	NA	NA	NA	20	22		15
Himachal Pradesh	Marchi	NA	NA	NA	NA	21		15



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Greenpeace is a global organisation that uses non-violent direct action to tackle the most crucial threats to our planet's biodiversity and environment. Greenpeace is a non-profit organisation, present in 40 countries across Europe, The Americas, Asia and the Pacific.

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Greenpeace has been campaigning against environmental degradation since 1971 when a small boat of volunteers and journalists sailed into Amchitka, an area north of Alaska, where the US Government was conducting underground nuclear tests. This tradition of 'bearing witness' in a non-violent manner continues today, and ships are an important part of all its campaign work.

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