

# POSITIVE EFFECT OF THE PANDEMIC COVID-19 ON POLLUTION IN DELHI

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## Abstract

Air pollution is one of the greatest social issues of the environment and has impinged on the lives of humans and animals causing a lot of health disorders. Air pollution causes fog, smog and initiates a lot of harmful gases in the environment that has greatly affected the humans with diseases like asthma, bronchitis and countless lung diseases. Delhi is one of the most polluted cities in India before COVID-19. But due to the widespread effect of Corona virus there was a lockdown throughout India. Now it seems in Delhi, the pollution has decreased. All the buildings are visible at present and the sky is very clear than before lockdown. Although numerous negative impacts were there due to the widespread of Corona virus throughout the world, the positive effect of COVID-19 is the lessening of pollution in India and throughout the world.

**Index terms:** Pollution, COVID-19, Corona virus, Purity of air, AQL.

## INTRODUCTION

Pollution is the prologue of pollutants that cause undesirable alteration into the standard milieu. Pollution can acquire the type of chemical substances or energy, such as noise, heat or light. Pollutants can be either unfamiliar substances or naturally occurring toxins. Previously the air we breathe used to be uncontaminated, unsullied. But, the air is getting more and more toxic day by day due to escalating industrialization and concentration of poisonous gases in the environment. Furthermore, these gases are the cause of many respiratory and erstwhile diseases. Elevated levels of air pollution can cause an augmented jeopardy of heart attack, wheezing, coughing breathing problems, exasperation of eyes, nose, throat, and aggravation of existing heart problems, asthma and other lung impediments.

Although environmental pollution can be caused by natural events such as forest fires and volcanoes, the word pollution usually implies that the contaminants have an anthropogenic source. Pollution has accompanied humankind ever since groups of people first assembled and remained for a long time in any one place. Pollution was not a sombre dilemma as long as there was adequate space available for each individual or group. However, with the establishment of uninterrupted settlements by immense numbers of people, pollution became a problem, and it has remained one ever since. Pollution of all kinds can have pessimistic effects on the environment and wildlife and often impacts human health and well-being<sup>1</sup>.

Pollution may muddy landscapes, poison soils and waterways, or kill plants and animals. Humans are also repeatedly harmed by pollution. Long-term exposure to air pollution, for instance, can lead to chronic respiratory disease, lung cancer and other diseases. Toxic chemicals that mount up in top predators can create some species unsafe to eat<sup>2</sup>.

The corona virus is a family of viruses that can cause a variety of illnesses in humans including common cold and more severe forms like SARS and MERS which are life-threatening. The virus is named after its shape which takes the form of a crown with protrusions around it and hence is known as coronavirus<sup>3</sup>. Corona virus disease (COVID-19) is an infectious disease caused by a newly discovered corona virus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment<sup>4</sup>.

The corona virus outbreak came to light on December 31, 2019 when China informed the World Health Organisation of a cluster of cases of pneumonia of an unknown cause in Wuhan City in Hubei Province. Subsequently the disease spread to more Provinces in China, and to the rest of the world. The WHO has now declared it a pandemic. The virus has been named SARS-CoV-2 and the disease is now called COVID-19<sup>5</sup>.

## STATEMENT OF THE PROBLEM

Global pollution poses a heavy threat to world nowadays in which Air pollution plays a vital role which alone kills approximately seven million people around the world every year. According to WHO, 9 out of 10 people breathe air which contains high level of pollution. Air pollution occurs both indoor and outdoor. The world's largest health and environmental problems are a result of indoor and outdoor air pollution<sup>4</sup>.

According to Global Alliance on Health and Pollution (GAHP) report in 2019 and Health Metrics, pollution remains the world's largest environmental threat to human health and death globally and the analysis underscores the severity of harm caused by air, water and occupational pollution. It further states that India and China go ahead in the number of pollution deaths among other world's largest and wealthiest nations<sup>6</sup>.

Pollution mainly takes place due to emissions from industries and factories, combustion of fossil fuels, oil for electricity, road transport, and agricultural activities, using pesticides, fertilizers and waste production. These pollutants are responsible for the deterioration of human health. Though many preventive measures are being worked out by all nations, it is still challenging the entire human beings. Other methods such as renewable energy resources, energy conservation, eco-friendly transportation and green building are on the process of protecting the earth. But all of a sudden, the dangerous COVID-19 has made the whole world lockdown for several months. On one hand this COVID-19 becomes threatening to the lives of people but on the other hand, this corona virus has shut down the entire activities of industries, factories, transportation and agricultural activities which give positive result to the present pollution problems. Thus this study is attempted to analyse the positive impact of CIVID-19 to the pollution problems especially in Delhi. Therefore the following objectives are framed.

## OBJECTIVES OF THE PRESENT STUDY

- To overview the pros and cons of Delhi pollution in current scenario.
- To understand the prevalent methods of reducing pollution in Delhi.
- To know the basic outcome of COVID-19.
- To analyse the positive effects of COVID-19 on pollution in Delhi.

## POLLUTION STATUS IN DELHI BEFORE LOCKDOWN

Delhi has earned the dubious distinction of becoming the most polluted major city in the world with an air quality index (AQI) of 527 on November 15, as per data by Air Visual on the World AQI rankings. Delhi air quality broke all records on November 5, when it was in the hazardous array for nine consecutive days, making this the longest spell of hazardous air quality since public records began, according to Air Visual<sup>7</sup>.

The air quality in Delhi, the capital territory of India, according to a World Health Organization (WHO) survey of 1,650 world cities, is the worst of any major city in the world. It also affects the districts around Delhi. Air pollution in India is estimated to kill about 2 million people every year; it is the fifth largest killer in India. India has the world's highest death rate from chronic respiratory diseases and asthma according to the WHO. In Delhi, poor quality air irreversibly damages the lungs of 2.2 million or 50 percent of all children<sup>8</sup>.

On 25 November 2019, the Supreme Court of India made statements on the pollution in Delhi saying "Delhi has become worse than narak(hell)"<sup>9</sup>

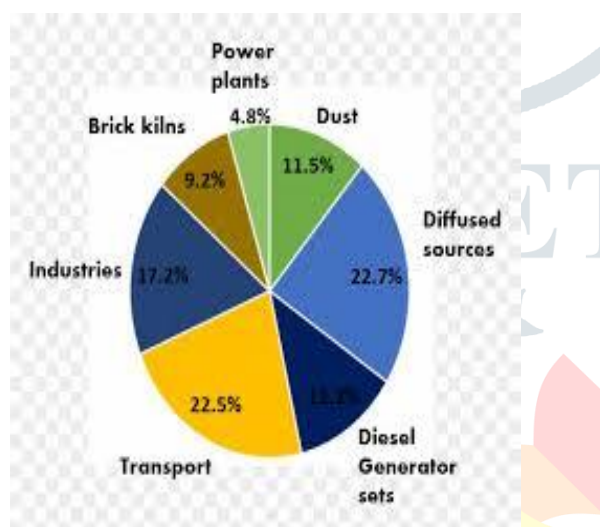


Fig-1: Smog and pollution in Delhi<sup>10</sup>

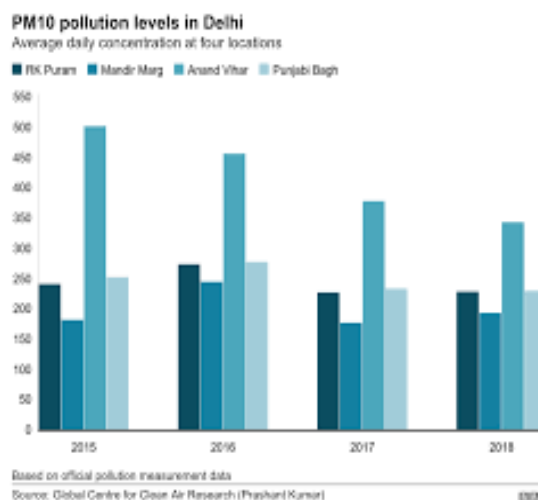


Fig-2: Delhi pollution<sup>11</sup>

From the pie-chart and bar diagram, it is clear that due to the development of industries, transport facilities and modern developments, Delhi is highly polluted. People are not able to see others. Buildings are invisible, sky is invisible, difficult to drive are some of the major problems faced by the public.

Even the government or public did not decide to stop the emission of oxides of nitrogen and sulphur from the industries or to stop vehicular emissions. But the sudden outbreak of COVID-19 due to corona virus had a positive impact on pollution globally. Even monuments including Taj Mahal, British Parliament were deteriorated due to severe air pollution and acid rain.

## POLLUTION STATUS OF DELHI AFTER LOCKDOWN

India is home to 21 of the world's 30 most polluted cities but recently air pollution levels have started to drop dramatically as the second-most populated nation endures the second week of a 21-day lockdown amidst corona virus fears, according to The Weather Channel. While the absolute shutdown of India's economy was designed to curb the swell of COVID-19, it is having an subsidiary health benefit of clearing the air that millions of people were choking on, according to CNN. As vehicles stay off the road, construction is put on hold, and factories stop production, the levels of microscopic particulate matter, or PM 2.5, start to drop.

Pawan Gupta, senior scientist at the Earth Sciences of Universities Space Research Association at NASA's Marshall Space Flight Centre, told Earther in an email that "It is true that pollution levels are going down and will continue to be lower as a result of lockdown". Gupta added that recent heavy rains in the north and west of the country have also helped the country's pollution levels and "Rain is a very effective aerosol removal process from the atmosphere and can bring down particulate matter values".

Since the March 25 lockdown that forced 1.3 billion Indians to stay home, air quality in New Delhi, usually the worst in the world has plunged to "satisfactory" levels. The lockdown order shut down offices, schools, movie theatres, malls, markets and "non-essential" service providers. All modes of public transport such as metro trains, buses, inter-state trains and domestic and international flights for civilian movement have also been stopped, according to Quartz<sup>12</sup>.

The effect of the lockdown has been vivid. In New Delhi, where flights have been diverted because smog shrouded the airport, the air pollution levels have dropped 71 percent in just one week. On March 20, the air had an unhealthy 91 micrograms per cubic meter of Particulate matter 2.5. On March 27, just a couple days into the lockdown, that level fell to 26 micrograms per cubic meter. Anything above 25 is considered unsafe, according to the World Health Organization, as CNN reported. Jyoti Pande Lavakare, the co-founder of Indian environmental organization Care for Air, and author of upcoming book *Breathing Here is Injurious to Your Health*, to CNN said "I have not seen such blue skies in Delhi for the past 10 years," and "It is a silver lining in terms of this awful crisis that we can step outside and breathe"<sup>13</sup>.

Statistics from the Central Pollution Control Board of India's Environment Ministry also showed a 71 percent decrease in nitrogen dioxide levels. Mumbai, Chennai, Kolkata and Bangalore have also recorded a plummet in these air pollutants, according

to CNN. In Mumbai, the financial capital, air quality levels in March 2019 averaged 153 on the Air Quality Index, which ranks as unhealthy to breathe, according to Reuters New Delhi averaged 161 last March<sup>14</sup>. The tops of skyscrapers were perceptible and some residents told Reuters they could spot more stars than usual. "The air quality is likely to slip into 'good' category soon. It is due to reduced vehicular traffic and increase in temperature," said Kuldeep Srivastava, who heads the regional meteorological centre at the Indian Meteorological Department, to The Weather Channel<sup>15</sup>. Delhi saw a third straight week of clean air, as the 21-day lockdown continued to reduce pollutants from industries, along with air and road traffic pollution. On Sunday, the overall Air Quality Index (AQI) in Delhi stood at 82, which falls under the 'satisfactory' category, per the System of Air Quality and Weather Forecasting and Research (SAFAR). The weekend before this saw the best air quality in the national capital region (NCR) in 2020, with an average AQI of 46.

As a consequence of inflexible travel restrictions and shutting down of non-essential activities including those of air polluting sectors, air quality improvement has been noted in many towns and cities across the nation. The nationwide 'Janta Curfew' followed by the 21-day lockdown to combat the corona virus pandemic have led to a significant reduction in pollution in the country with 91 cities recording air quality in the 'good' and 'satisfactory' category on March 29, a Central Pollution Control Board report has stated. Travel restrictions and closure of industries have helped reduce the pollution level. The pollution watchdog said that the major sectors contributing to air pollution are transport, industries, power plants, construction activities, biomass burning, road dust, residential activities, certain activities such as operation of diesel generators, restaurants, landfill fires, etc.

According to the report, on March 21 (a day before the Janta Curfew) a total of 54 cities recorded 'good' and 'satisfactory' air quality while on March 29 as many as 91 cities recorded minimal pollution. India is currently under the biggest lockdown with around 130 crore people asked to stay home in view of the corona virus outbreak, which has claimed 50 lives and infected over 1,900 people in the country. Since the lockdown was imposed, the air quality all around the country has shown drastic improvement due to eradication of local pollutants generated due to construction activities and vehicular traffic among others.

The CPCB has released a report on the impact of 'Janta Curfew' and lockdown on the air quality. Out of the 91 cities that showed minimal pollution, as many as 30 cities recorded good air quality while 61 cities recorded 'satisfactory' air quality, the report showed. Moreover, the number of cities recording poor to severe air pollution also came down from nine (March 21) to 0 (March 29), the report said. An AQI between 0-50 is considered good, 51-100 satisfactory, 101-200 moderate, 201-300 poor, 301-400 very poor and 401-500 severe as depicted in Table-1. Air Quality Index is assessment of the air quality by taking into account different factors. The lower the AQI the better the air is considered to be. Delhi which battles high levels of pollution almost through the year also showed momentous enhancement.

**Table-1: AQI Chart as per CPCB<sup>16</sup>**

AQI	Remarks	Possible Health Impacts
0-50	Good	Minimal impact
51-100	Satisfactory	Minor breathing discomfort to sensitive people
101-200	Moderate	Breathing discomfort to the people with lungs, asthma and heart diseases
201-300	Poor	Breathing discomfort to most people on prolonged exposure
301-400	Very Poor	Respiratory illness on prolonged exposure
401-500	Severe	Affects healthy people and seriously impacts those with existing diseases

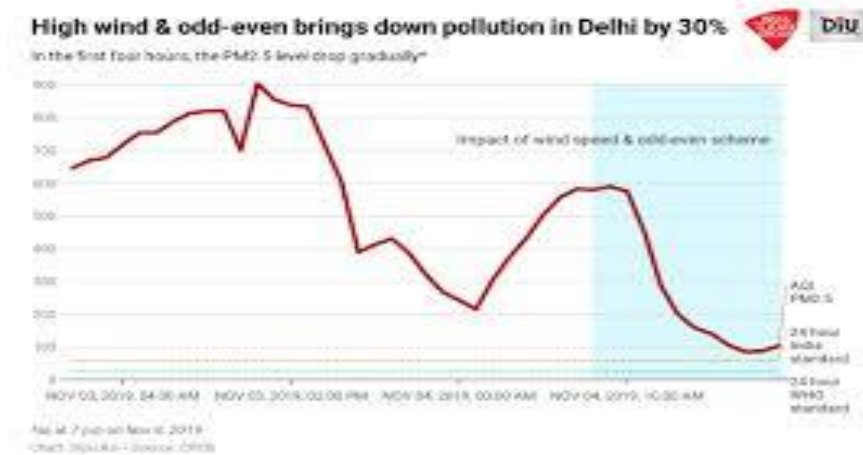
On the day of 'Janta Curfew', as a consequence of amalgamation of reduced vehicles on the road, functioning of only indispensable commercial units and prevailing weather conditions, a significant reduction was noted for PM10 and NOx (nitrogen oxide) levels, the report said. On March 21, the AQI was 'Moderate' in Delhi which gradually improved from higher to lower end of the category.

"Overall, up to 44 per cent reduction in PM10 levels was observed in Delhi during March 22-23, compared to previous day. The PM2.5 reduction was though 8 per cent on the curfew day but declined to 34 per cent next day owing to negligible combustion activities," the report said. The report said the air pollution reduction trend in NCR towns was relatively less pronounced compared to NCT of Delhi. "While, reduction in PM10 levels were observed on March 22, 2020 in all neighbouring towns except Gurgaon, PM2.5 levels remained high, showing only slight reduction in Noida (6 per cent) and Ghaziabad (9 per cent). This can be attributed to localized combustion activities in NCR towns.

"Similarly, while significant reduction in NOx levels was observed in Noida (55 per cent), Ghaziabad (51 per cent), the same was not noted in Gurugram (4 per cent) and Faridabad, where NOx emissions were found higher during early hours of curfew signifying higher vehicular movement during that period," it said. On other cities, the CPCB said the improvement in air quality of 85 cities was noted as most of the vehicles remained off road and non-essential industrial units closed during Janta Curfew and national wide lockdown. The report further said that most of the million plus population cities, which have high population density and substantial share of emissions from transport sector, showed improvement in air quality levels.

Indo-Gangetic cities illustrated significant enhancement in AQI values with levels moving from higher to lower end of the category and 17 cities moving in 'satisfactory' category and seven cities in 'good' category. The AQI value in coastal areas was slightly improved though not as significantly as noted for Indo gangetic plains, the report said. "On the day of the curfew, Chennai and Mumbai remained in 'satisfactory' category; however a slight increase in AQI value was noted in Chennai on the next day, possibly due to local contribution. Higher AQI value was seen in Kanpur with PM2.5 as prominent pollutant, likely

emanating from local combustion sources, the report said. On the other hand, the report said the positive impact on air quality was not observed significantly in industrial cities. The graph of decrease of pollution in Delhi is given below in Fig-3.



**Fig-3: Pollution decrease in Delhi<sup>17</sup>**

"High AQI value was noted in Vapi, Ratlam (Sulphur di-oxide as prominent pollutant), Satna, Singrauli and Chandrapur seemingly due emissions from industrial areas. Overall, Janta Curfew resulted in general improvement in air quality across the country with quantum of improvement being varied based on local contribution sources, though regional contribution was largely absent<sup>18</sup>.

COVID-19 has shed a global gloom by causing severe damage to health, the economy and general societal well-being. Momentarily, clean air provides some relief while a major portion of the world population remains indoors, abiding by social distancing norms. In India too, after many years, the blue sky can be spotted in normally hazy regions, as corroborated by satellite images, pollution data, and social media posts. However, the present air quality (AQ) improvement in India dwells in paradox. Amidst the devastating COVID-19 crisis, it is neither the time to rejoice clean air nor would one want air quality to improve this way in the future. Compared during the equivalent period, the top ten cities with the worst weekly average AQI values in 2020 have better air quality than the most horrible performers in 2019. First, the peak AQI value has dropped significantly, from an AQI of 298 in Sirifort, Delhi to 207 in Guwahati. Second, the cities with the worst AQI levels now are mostly different than those in 2019<sup>19</sup>. As a result COVID-19 paved a way in the reduction of air pollution globally.

#### CONCLUSION

India, the largest democratic country with 1.3 billion populations went into 21 days lockdown on 25<sup>th</sup> March 2020. The lockdown was a crucial and essential first step. It was perhaps the most crucial decision for determined action to quarantine 1.3 billion people with a complete closure of all travel and enforced social distancing and isolation. This led to a positive impact on pollution in Delhi. During this lockdown clean air affords a little relief in metropolitan cities from severe air pollution. After this break the country must take necessary steps in prevention of pollution. Some sources say that the pollution may severely increase after the lockdown. It is certain that Scientists and Researchers will inevitably grab the curfew pane to comprehend background echelons of air pollutants when the emissions from most imperative segments, including transport and industry, have momentarily dwindled. For all other citizens this might be an opportunity to make a sturdy demand for clean air from the authorities. Sustaining the good air days after the COVID-19 lockdown can be mitigated by tapping into the sole facets of air quality while the air is still breathable. Thus, before rejoicing over the contribution of COVID-19 burdens, it is crucial to identify the contemporary developments in air quality in India devoid of indulging in a description of highlighting the air quality only in big metropolitan cities.

#### REFERENCES

1. <https://www.britanica.com/science>
2. <https://www.worldwildlife.org>
3. <https://economictimes.indiatimes.com/news>
4. <https://www.who.int/health-topics>
5. <https://www.thehindu.com>
6. <https://www.gahp.net>
7. <https://www.news18.com>
8. <https://en.wikipedia.org/wiki>
9. Hindustan Times. 25 November 2019
10. [pngfind.com](https://www.pngfind.com)
11. [bbc.com](https://www.bbc.com)
12. <https://qz.com/india/1827993>
13. <https://www.cnn.com/2020/03/31>
14. <https://uk.reuters.com/article>
15. <https://www.ecowatch.com>
16. [https://app.cpcbcr.com/AQI\\_India](https://app.cpcbcr.com/AQI_India)
17. [Indiatoday.in](https://www.indiatoday.in)
18. <https://www.news18.com/news/india>
19. <https://science.thewire.in/environment>