



Centre of Excellence for Research on Clean Air (CERCA)

Indian Institute of Technology Delhi  
Research on Air Pollution and Climate Change

Monthly Newsletter April 2021



## ***Editorial***

### **Covid Pandemic & Climate Change**

Dear Readers,

We are facing two very serious existential issues: One, immediate crises of Covid Pandemic and second, the long-term crises of Climate Change. All of us are trying to cope with the challenges of the second wave of COVID which has hit India very hard. We hope that this will abate soon, though we have to be on guard and take all precautions. The COVID pandemic has also made it clear that Mother Nature is very strong that the survival and wellbeing of the entire world is interlinked.

The recent research report from Lancet indicates the airborne transmission of Covid virus. This means that the Indoor Air Quality improvement measures have to include reducing the virus load in micro-environments like homes, hospitals, classrooms, restaurants, offices, public transportation, etc. Therefore, urgent research is required to examine to reduce airborne virus transmission through more effective HEPA filters, electrostatic precipitators, radiation, and redesign of Air Conditioning systems.

Another important area that needs collective action of all nations is Climate Change. To prevent global temperatures from rising to dangerous levels we need to re-engineer our society away from fossil fuels. The biggest contribution as individuals would be to become a part of the solution to this gigantic problem. According to a 2015 study, about 80 percent of global coal reserves, 50 percent of global natural gas reserves, and 33 percent of world's oil must be left unused for bringing global warming under control. India is one of the hardest hits by climate impacts and ranks fifth in

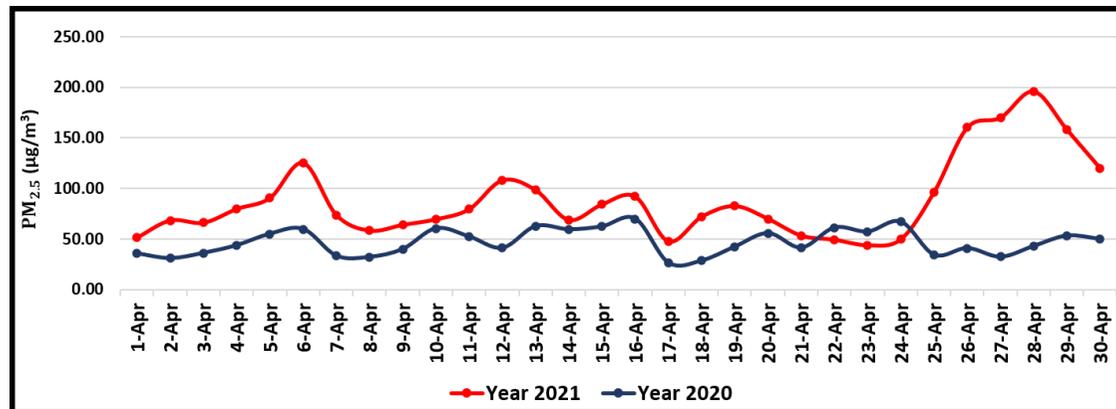
the Global Climate Risk Index 2020. Action is required on multiple levels — government, industry, and individuals — and across multiple systems, including energy, transportation, housing, and food. Though there is growing public support for climate action, we need solutions that are in India's interest. As individuals, the most effective contribution would be a reduction in household and personal carbon footprint. Using solar energy, commuting on electric vehicles, and eating a more climate-friendly diet could be a potent force for bringing about desired societal change. Indian cities, irrespective of their location, must plan and invest more in climate resilience for their survival by reducing their carbon footprint. For us in India, Air Pollution and Climate change are interlinked problems and actions taken to reduce Air Pollution will have co-benefits for Climate Change.

Several countries have committed to the Net Zero goal by 2050. India has committed to bringing 40% of its electricity capacity under non-fossil fuels by 2030 and lowering its emissions to GDP ratio by one-third from 2005 levels. India must take lead in expanding forest cover and supporting R&D for Carbon Capture technologies.

**Arun Duggal**  
 Founder, CERCA



**Air Quality Trend for Delhi: One of the Most Polluted Cities in the World**

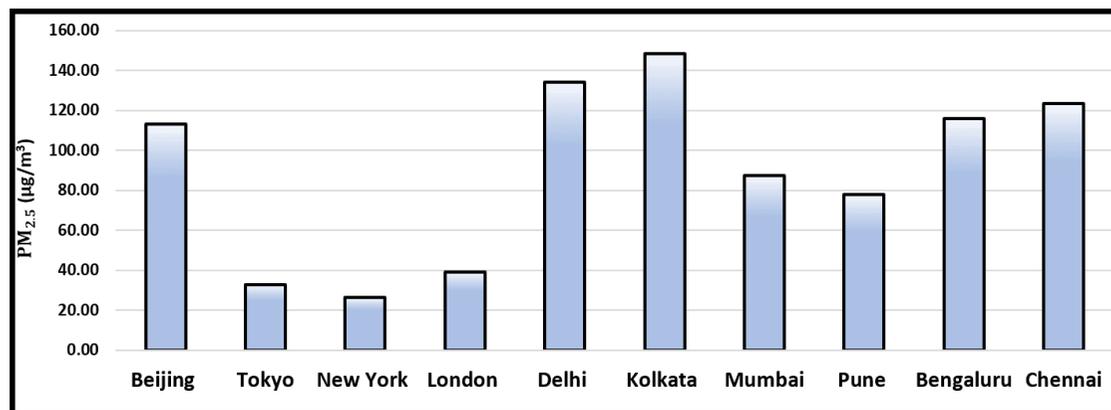


Data Source: CPCB

The impact of total lockdown on Delhi Air Quality trend in April 2020 is clearly observed as compared to

April 2021. This may be attributed to a decline in anthropogenic activities in 2020. Additionally, very high  $PM_{2.5}$  values observed during the last few days in April 2021 may point towards higher wood burning in over choked crematoriums across the National Capital Region of Delhi as several shreds of evidence found show increased organic components in particulate matter in the air.

### Air Quality Trend (April 2021) for different national & international cities



Data Source: aqicn.org

The graph shows the daily average  $PM_{2.5}$  for the April month of 2021. Amongst the popular cities worldwide, Kolkata has shown the highest concentration of  $PM_{2.5}$  followed by Delhi. Delhi and Kolkata rank amongst top most polluted cities worldwide. While the other Indian cities in the graph are amongst the top 10 metropolitan cities.



From Air pollution to Climate change, CERCA virtual Expert Talk series spotlights a range of contemporary issues while providing a platform for renowned speakers from around the world to share their knowledge and views.

The third eminent speaker in the series is Ms. [Karin Shepardson of the World Bank](#) who would speak on “**Airshed Management: Converging Science and Policy at the Impact Scale**” on May 07, 2021, at 3:00 PM (IST). Ms. Shepardson is a Lead Environmental Specialist at World Bank’s Environment, Natural Resources, and Blue Economy Global Practice South Asia Region unit with over 30 years of experience on issues at the interaction of environmental science and development policy. She currently leads the World Bank’s India Air Quality Management team and manages several World Bank investment projects in South Asia on solid waste management and plastics waste reduction.

To register for this informative session, [click here](#).



## CERCA Events



### Expert Talk delivered by Prof. Alan Hedge on April 02, 2021

Prof. Emer. Alan Hedge delivered a talk on “Airborne Disease Transmission: What we have learned because of COVID-19” on April 2<sup>nd</sup>, 2021. He discussed in detail what we now know about the airborne transmission of particulate and biological contaminants, and especially the airborne transmission of COVID-19. If you have missed this seminar, the link below will take you to the recorded video.

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## CERCA Expert Opinion and Research Outcomes

### “Five-point agenda to accelerate India’s clean air mission” - An Opinion Paper by Dr. Sagnik Dey

Dr. Sagnik Dey is an Associate Professor at Centre for Atmospheric Sciences, Indian Institute of Technology-Delhi, and coordinator of CERCA.

India embarked on a journey to reduce the staggering health burden attributable to air pollution. Despite series of policies and programs announced in recent years, the impact is not discernible. The five-point agenda discussed here would accelerate India’s progress towards cleaner air.

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### How poor Air Quality is impacting student’s behavior in educational Centers

*Balal Oroji, Asghar Sadighzadeh, Eisa Solgi & Mohammad Sadegh Oliaei*

- Air pollution in indoor and outdoor environments is one of the most important environmental problems in metropolises and industrial cities.
- The study explores the effects of air quality on the well-being of students at Shahid Beheshti University in Tehran.
- There were more pronounced symptoms during summer and autumn.
- The life of the building, the use of natural ventilation, and inadequate cooling devices are the main contributing factors for increasing the concentration of indoor particles in the educational buildings.

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### Vegetational Planning for the greening of urban spaces

*Elizabeth Chávez-García & Balanca González-Méndez*

- Air purification of polluted cities is critical for protecting the health of the rising population.
- The paper discusses the interrelationships between different types of vegetation and the urban environment.

- The study proposed using a knowledge-based planning framework to designate zones with similar characteristics across the city and to select the vegetation according to the necessities of each of these zones.

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## CERCA in Circulation



### A national task force to monitor air pollution in 124 cities

The National Green Tribunal (NGT) has directed the constitution of an eight-member national task force to oversee air quality monitoring of 124 non-attainment cities (NACs) in the country. The task force will monitor remedial steps to improve air quality in the NACs. These are the places where air quality has generally remained poor and breached pollution parameters for five years.

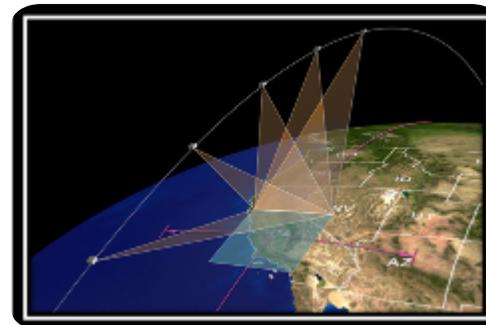
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### Indian businesses lose \$95 billion every year due to Air Pollution

Air pollution costs Indian businesses about \$95 billion (about ₹7-lakh crore) every fiscal year, which is around 3 percent of India's total GDP, according to a major research report. The cost is equal to 50 percent of all tax collected annually, or 150 percent of India's healthcare budget. If air pollution continues to increase at currently projected rates, this figure could nearly double by 2030.

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### Research suggests airborne transmission of SARS-CoV-2 virus

There has been a dilemma regarding how SARS-CoV-2 virus gets transmitted. An article published in "The Lancet" by Greenhalgh, T. et al., explains the transmission of SARS-CoV-2. The article consists of ten scientific reasons in support of airborne transmission of SARS-Cov-2 with adequate evidences. The article concluded that there is consistent, strong evidence that SARS-CoV-2 spreads by airborne transmission. Although other routes can contribute, it's a belief that the airborne route is likely to be dominant.

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### NASA to use satellite data to map air pollution and improve health

NASA scientists will be teaming up with epidemiologists in the agency's first health-focused mission. With satellite data, they'll find out how air pollution affects health in cities around the world. NASA's Multi-Angle Imager for Aerosols (MAIA) mission, scheduled for launch in 2022, will combine the expertise of planetary scientists and epidemiologists to answer a question that, before now, has been largely impossible at a large scale: What kind of air pollutant particles is most harmful to human health?

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