



Editorial

Air pollution education- An opportunity for schools to strike a change in the next generation

Dear Readers,

There is growing evidence on the impact of poor air quality on school children in urban areas. During a survey on Indoor air quality carried out by CERCA in Indoor spaces of various Delhi buildings including schools, it was found that schools due to their high occupancy environments create a number of PM pollutants such CO₂, moisture, bio-effluents, dust, and volatile organic compounds (VOCs). The survey found that PM_{2.5} and PM₁₀ concentrations in schools were 3-8 times higher than national ambient air quality standards and 12-15 times higher than WHO standards. Similarly, CO₂ and TVOC concentrations were also observed very high in some schools which exceeded the permissible limits. Close proximity of schools to busy road intersections and the impact of wind direction are major factors leading to higher air pollution exposure in school-going children who spend a major part of their time in schools.



There is a pressing need to set out an India-wide air pollution awareness strategy for school-going children by empowering young students to take the lead through air pollution education and encouraging them to take action themselves. A logical point for schools to start this campaign should be air pollution measurement through effective community-based air quality monitoring projects using portable low-cost air quality sensors to monitor air pollution at the point of exposure to educate and protect the young lives. Another way could be using Indoor/Outdoor air quality testing kits for educating young students about different air pollutants, such as ozone, particulate matter, and nitrogen dioxide, and how they affect them. School-level awareness programs especially those focusing on solutions for air pollution help in developing a proactive attitude and a sense of ownership within school children, over their school and the city they are residing in. Air pollution should constitute a part of the basic syllabus for every school. Awareness about the causes and solutions for air pollution empowers young students to make a difference in their own lives through their own actions. Such activities will not only hone the scientific observation and data interpretation skills of young students, but also help them in experiencing how science fits into their daily lives and health, and also how air quality is closely associated with human activities. It is high time that government, industry, NGOs, social and political activists facilitate a dialogue between the children, their parents, and the community about the air quality in their region and locality. Only by consciously nurturing our young minds with these important issues, can we as a society make their future secure and sustainable. What is required is a conscious set of young minds to take on this mantle and relentlessly drive it through.

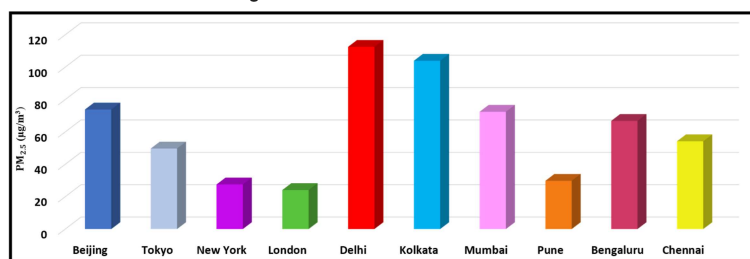


Regards,

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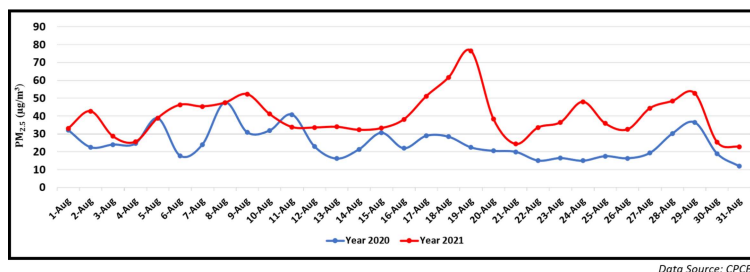
Air Quality Trend August 2021: Delhi continues to be the highly polluted city among different Indian & International Cities



The graph shows the daily average PM_{2.5} for the month of August 2021. Amongst the popular cities

worldwide, Delhi has shown the highest concentration of PM_{2.5} followed by Kolkata and Mumbai. Delhi and Kolkata rank amongst the topmost polluted cities worldwide while the other Indian cities in the graph are amongst the top 10 metropolitan cities. Since April 2021, Delhi and Kolkata have been constantly topping the list of most polluted cities on an international scale.

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

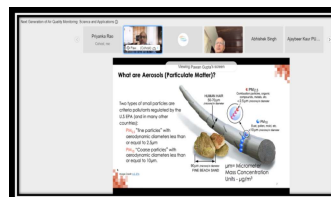
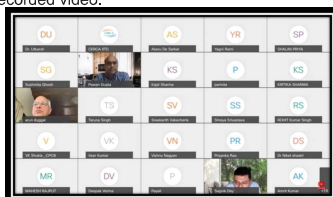


As Covid-19 cases in August 2021 are on a steep decline, Delhi has been fully unlocked. The impact of increasing social gatherings and anthropogenic activities on Delhi Air Quality can be clearly correlated and observed in the graph. PM_{2.5} has increased by 15.26 µg/m³ on an average in August 2021 as compared to August 2020.



Expert Talk delivered by [Dr. Pawan Gupta](#) on August 20, 2021

Dr. Pawan Gupta delivered a talk on "Next Generation of Air Quality Monitoring: Science and Applications" on August 20th, 2021. He presented an overview of the global air quality monitoring status, gaps, and opportunities. He discussed the role of Earth Observing Satellites (EOS) in global air quality monitoring with specific emphasis on aerosol retrievals, datasets, and satellite missions. The role of a low-cost air-quality monitor network in understanding spatial and temporal gradients in column and surface particles loading has been also explained. If you have missed this event, the link below will direct you to the recorded video.



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"Applications of LCS in air quality management" - An Opinion Paper by Dr. Saumya Singh

Dr. Singh is a postdoc researcher at the University of California, Berkeley, USA.

Air pollution monitoring is the first step towards effective air pollution management. In India, fine particulate matter (PM_{2.5}) is one of the most relevant pollutants, posing the largest risk for ill health and death. The heterogeneity of air pollution sources in India challenges air quality management despite the continuous effort of government regulatory bodies under a series of policies and programs to expand the air pollution monitoring network across the country. One key factor impeding effective air pollution management is the major data gaps from smaller cities and rural areas which are home to more than 60 % of the population.

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The science behind the recurrent pattern of extreme fire weather in California

Rackhun Son, S.-Y. Simon Wang, Seung Hee Kim, Hyungjun Kim, Jee-Hoon Jeong, and Jin-Ho Yoon

- Historical wildfire events in California have shown a tendency to occur every 5-7 years.
- This oscillation is evident in multiple historical climate records and appears to be continuing.
- The 5-7 years oscillation is linked to a sequence of anomalous large-scale climate patterns.
- The evolving patterns of the Pacific to North America atmospheric teleconnection suggest the role of tropical and subtropical forcing.

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Detectability of the reduced COVID-19 global emissions in local CO₂ concentration measurements

Helen F. Dacre, Luke M. Western, Daniel Say, Simon O'Doherty, Tim Arnold, Chris Rennick, and Ed Hawkins

- 12% decline in CO₂ emissions estimated due to COVID-19 related downturn in economic activity.
- Despite the large decrease in CO₂ emissions, the trend in background atmospheric CO₂ did not reduce.
- COVID-19 magnitude emissions reductions are detectable in daily CO₂ concentrations after at least 38 months, and in monthly CO₂ concentrations after 11 months of sustained reductions.
- Delay of several years between changes in a policy designed and our ability to detect the impact of these policies on CO₂ concentrations.

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IIT Delhi researchers develop a modified cotton fabric that absorbs air pollutants

According to the research team, air pollution resulting from the rising levels of particulate matter, nitrous oxides, sulphur oxides, carbon oxides, and other toxic volatile organic compounds (VOCs) is a major concern. In this study, they have shown the functionalization of cotton fabric by ZIF MOFs (ZIF-8 and ZIF-67) using a rapid, facile, eco-friendly, and scalable approach. The ZIF functionalized textiles possess a huge potential for applications as protective garments and in controlling indoor air pollution. These fabrics may be used as upholstery for controlling gaseous pollutants that cannot be filtered out using filter media.

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Climate change is the tipping point driving migration – building local resilience is key

At present, we haven't got much statistical data on climate migration – but we know with surety that huge internal migration is happening across India. This reflects in the informal settlements of people we see growing in India's cities. Of course, people also leave their original locations because they want better opportunities available elsewhere. That's part of aspirational human nature and the simplest reason for migration. But there is a very large section of migrants now which isn't leaving because of pull migration but instead, push migration- people are being pushed out of their homes by agrarian failure and growing economic distress.

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Can we stop the runaway train of climate change?

The choice is still in our hands, but the window of opportunity is closing fast. The Climate Change 2021: The Physical Science Basis report, the first of IPCC's sixth round of Assessment Reports (AR6), issued the starkest warning yet by the world's climate scientists: humans are 'unequivocally' causing 'irreversible' climate change by burning fossil fuels for energy and emitting planet-warming greenhouse gases (GHG) like CO2. In fact, the report says, the worst of what we are seeing today, from glacier melt to heatwaves to wildfires, cyclones and floods, is the result of the heating of the past few decades. The additional heating we are causing today, with our present emissions, will result in worse climate catastrophes in the near future.

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The concentration of air pollutants significantly increasing over India: IPCC

India, and especially its capital, Delhi, have been annual witnesses to apocalyptic-looking winters in the past half-decade. Delhi's residents have especially gasped for air like smoke from paddy straw fires, Diwali firecrackers, industrial and vehicular emissions that have besieged their city every year. Now, the latest report by the Intergovernmental Panel on Climate Change (IPCC)'s latest report released on August 9, 2021, has certified what we all feared: Air pollutants continue their meteoric rise across India and other parts of South Asia. The revelation came in Chapter 6 titled *Short-lived climate forcers* (SLCF) of the Sixth Assessment Report of the IPCC.

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