

Editorial

The need to develop long term strategy to make carbon capture feasible in India

Dear Readers,

There is a plethora of talk about climate change and energy transition, but very little is discussed on what and how to deal with the carbon already in the atmosphere. Though there are proven negative emission technologies (NETs) available for the elimination of greenhouse gases from the air, there is very little clarity on the way forward to scaling these technologies fast enough in order to make a substantial difference. There are many pathways for carbon sequestration that have the potential to remove several billion tons of CO₂ from the environment such as forest restoration, bio-energy with carbon capture and storage, agricultural techniques that increase soil carbon storage and using CO₂ in biofuels, chemical polymers, and building materials.

Artificial Carbon Sequestration can complement natural sequestering in fighting climate change and it is high time to put regulations in place requiring companies to utilize CO₂ directly captured from the air. As global warming accelerates due to continuous emission of greenhouse gases by countries, the idea to invest in artificial Carbon sequestration technologies such as ocean & geological sequestration or CO₂ injection into underground depleted oil reservoirs, aquifers, and coal seams is gaining ground. However, the nascent stage and high cost of these technologies prevent their widespread usage. While artificial sequestration would not entirely make up for emissions from fossil fuel burning, it would certainly offset a substantial part of it. As per the Intergovernmental Panel on Climate change, in order to avert the worst effects of climate change in this century, countries would need to eliminate 100 Bn-1 Trn tons of CO₂ from the environment, which is far more than what can be possibly removed by just planting more trees. Though trees and other plants can eliminate some atmospheric CO₂, it is not practically possible to quickly plant and grow enough trees that can do the job alone.

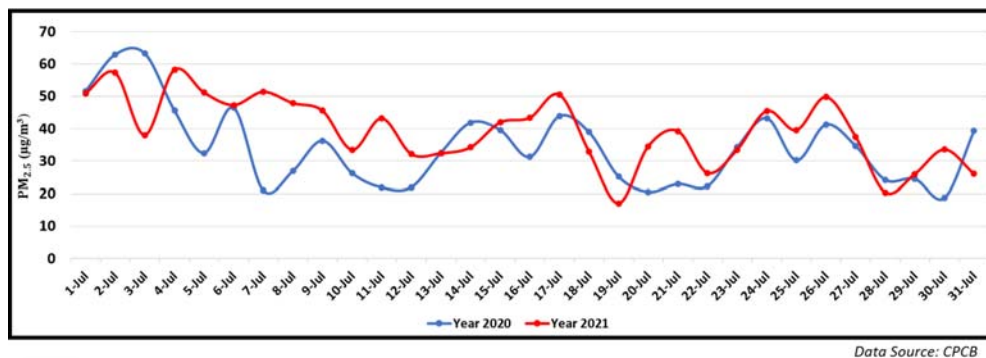
As India gears up to meet its GHG emission targets, a clear policy towards incentivizing the adoption of artificial methods of CO₂ capture and a thrust to indigenous R&D efforts for developing cost-effective CO₂ sequestration technologies would greatly help the country achieve the target of creating additional 2 billion tons of carbon sequestration by 2030.

Regards,

Hemant Kaushal
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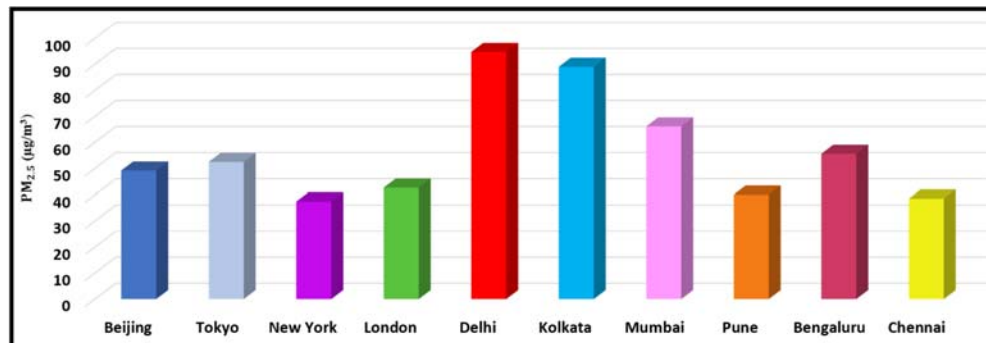




Data Source: CPCB

As Covid-19 cases in July 2021 are on a steep decline, Delhi has been fully unlocked. The impact of increasing anthropogenic activities on the Delhi Air Quality can be clearly correlated and observed in the graph. PM_{2.5} has increased by 4.99 µg/m³ on an average in July 2021 as compared to July 2020.

National & International Cities Air Quality Trend for July 2021



Data Source: aqicn.org

The graph shows the daily average PM_{2.5} for the month of July 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 international scale.



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 fourth eminent speaker in the series is [Dr. Pawan Gupta](#) from NASA Marshall Space Flight Center who would speak on **“Next Generation of Air Quality Monitoring: Science and Applications”** on August 20, 2021, at 5:00 PM (IST). Dr. Gupta is currently a senior scientist – earth sciences in the Science and Technology Institute (STI), USRA at NASA’s Marshall Space Flight Center. His main research expertise is in the remote sensing of atmospheric aerosols including, algorithm development, validation, and application to climate change and air quality monitoring, forecasting. He has also published more than fifty peer-reviewed research studies focusing on topics of his research expertise.

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



Launch of MTech. Programme in Electric Mobility & Panel discussion event on Outlook for EV Business on July 28, 2021

Arun Duggal Centre for Clean Air (CERCA) and Centre for Automotive Research and Tribology (CART) on behalf of IIT Delhi organized an online event to launch a new Post Graduate Programme “M. Tech. in Electric Mobility” at IIT Delhi which was followed by a panel discussion on “Outlook for EV Business”. This unique MTech program is one of the first of its kind in the country aimed towards addressing the fast-emerging need for developing skills in Electric Vehicle technology. The event was inaugurated by Sh. Amitabh Kant, IAS, CEO, Niti Aayog, Govt. of India. The panel discussion which was moderated by Mr Arun Duggal, Founder CERCA comprised of eminent industry captains and leaders from the automotive industry such as Naveen Munjal (Hero electric), Rajiv Vij(Carzonrent), Pawan Jain (Safexpress), Ramesh

Dorairajan (Tata Motors), Koushik Bhattacharya (Aventus Capital) and Mehul Shah(Exide Leclanche energy). If you have missed this event, the links below will take you to the recorded video of the launch programme and panel discussion respectively.



[MTech. Launch Programme ... Watch more](#)

[Panel Discussion...Watch more](#)

CERCA Expert Opinion and Research Outcomes

“Mitigation of Air Pollution in the National Capital Region of Delhi: Role of Urban Local Bodies (ULBs)” - An Opinion Paper by Dr. Palak Balyan

Dr. Palak Balyan works as a Consulting Staff Scientist at HEI's Global Health program, based in Delhi, India.

Air pollution is among the leading risk factors for human health in India. The magnitude of air pollution is massive all over the country covering both Urban-Rural areas. The National Capital Territory of Delhi is among the most polluted cities in the world; PM2.5 levels often exceed the Indian National Ambient Air Quality Standards, especially during winter months. Major sources of air pollution in Delhi-NCR include vehicles, roadside dust, industries, garbage burning, construction & demolition dust; most sources are anthropogenic and therefore require targeted mitigation efforts.

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Science finds a correlation between urban environment and obesity

Jeoren de Bont, Sandra Marquez, Silvia Fernandez-Barres, Charline Warembourg, Sarah Koch, Cecilia Persavento, Silvia Fochs, Nuria Pey, Montserrat de Castro, Serena Fossati, Mark Nieuwenhuijsen, Xavier Basagana, Maribel Casas, Talita Duarte-Salles, Martine Vrijheid

- Urban exposures may increase childhood obesity risk.
- Multiple exposures have scarcely been studied.
- An exposure pattern of high air pollution, noise, and traffic were associated with obesity risk.
- PM_{coarse}, land use mix and food environment were separately associated with obesity risk.
- Urban exposure was not related to weight-related behaviors in children.

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CERCA in Circulation



Lower-income households shoulder the highest health risks posed by outdoor air pollution



IITM develops new Model to tackle Air Pollution Menace in Delhi-NCR

Much ahead of the air pollution season in

A new study has found that the mortality risk from indirect sources of air pollution other than vehicles and industrial emissions falls disproportionately on lower-income households in India. Indian households are a known contributor to high levels of particulate matter PM_{2.5}, primarily due to biomass cooking stoves. Cooking stoves contribute to indoor or household air pollution (HAP).

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UK Research and Innovation (UKRI) funds new projects to explore how indoor air pollution affects human health

Three new research projects have received a share of £9 million to investigate how air pollution in indoor spaces can affect human health. In the UK, air pollution is responsible for an estimated 40,000 early deaths a year. Now, funding from UK Research and Innovation (UKRI) will be used to better understand how the composition, concentration, and exposures of air pollutants affect children with asthma and people living in urban homes.

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northwest India, especially in Delhi-NCR, scientists have come up with a Decision Support System (DSS) that will not just help zero in on the exact sources contributing to Delhi's pollution, but also predict practical scenarios in winters. The model, developed by scientists from the Indian Institute of Tropical Meteorology (IITM) in Pune, will be operationalized by October.

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India, China most vulnerable to joint risks of climate change and air pollution

Scientists at the University of Notre Dame found a "strong and statistically significant" link between the two environmental hazards and said the countries which are at the most risks of climate change are also the countries with the highest risks of toxic pollution. India & China are among the world's top 5 countries most vulnerable to climate change & air pollution with the capacity to deal with risks, a first of its kind research assessing the combined risks.

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