



**Editorial**

Dear Readers,

In recent years, several medium and small-scale cities have been added to the list of non-attainment cities in India due to rising levels of air pollution which has now become a serious health concern for the people. Air pollution emissions primarily stem from different sectors which inter-alia include power, transport, industry, residential, construction, and agriculture. The impact of air pollution is not only limited to human health, but it extends to agriculture and general well-being of our floral and faunal population. Since air pollution isn't a localized phenomenon, the impact is felt in cities and towns far and wide from the polluting source, thereby, creating the need for inter-state/inter-city coordination including multi-sectoral synchronisation for addressing the issue. While the problem of air pollution is mainly urban centric, several studies suggest regional scale pollution, particularly in the entire Indo-Gangetic plains of India and more industrialized states where it is more concentrated. With the Government taking several steps to address the issue under the National Clean Air Programme (NCAP), there has purportedly been some minor improvement in air quality in some major cities in recent times, but it would be naive to address this as a trend. Our country needs focused and time bound initiatives at both city and regional level for addressing the issue comprehensively. CERCA's project with the World Bank on developing an Air Quality Management model for the Indo Gangetic plain is one such initiative in this direction. It has been the endeavour of CERCA to develop its programmes with an aim at aligning them with the National Missions in India.



Yours sincerely,

Hemant Kaushal  
Pr. Coordinator  
**Arun Duggal Centre of Excellence for Research in climate  
change and Air Pollution**

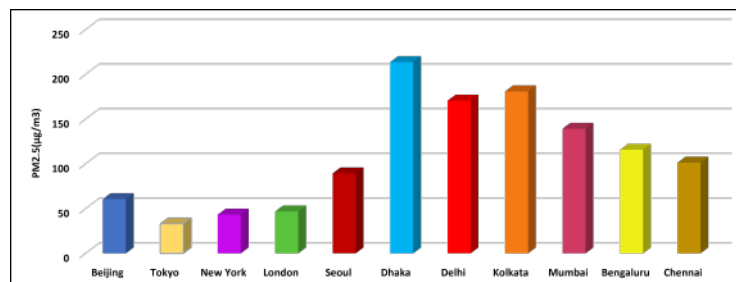



**Air Quality Trends**



**Indian & International Cities- February 2022**

**Dhaka has the highest Air Pollution among all the major International Cities**



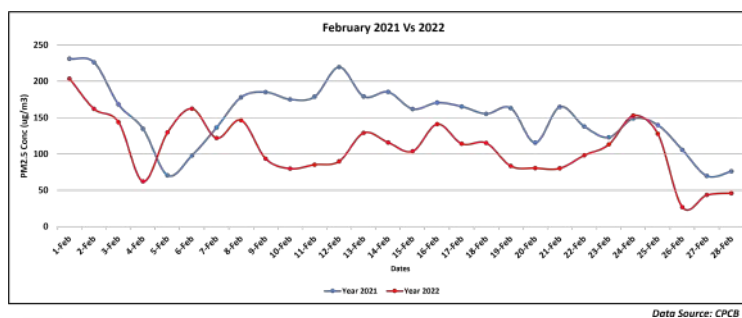
Data Source: [aqicn.org](http://aqicn.org)

The graph above shows the daily average PM<sub>2.5</sub> for the month of February 2022. Amongst the popular cities worldwide, Dhaka has shown the highest concentration of PM<sub>2.5</sub> followed by Kolkata and Delhi.

Delhi and Kolkata, within India, rank amongst the topmost polluted cities worldwide while the other Indian cities in the graph are amongst the top 10 metropolitan cities.

### Delhi PM<sub>2.5</sub> (24 hr. daily average) Trend

February 2021 Vs February 2022



Data Source: CPCB

February in 2022 witnessed cleanest air since 2017, according to CPCB. Rainfall and strong winds helped with the dispersion of pollutants, thus helping in improving the quality of air. Hence, PM<sub>2.5</sub> has decreased by 43.27 µg/m<sup>3</sup> on an average in February 2022 as compared to February 2021 making air quality better with respect to last year. But as the month ends, PM<sub>2.5</sub> levels have started to increase.



From Air pollution to Climate change, CERCA virtual Expert Monthly 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.

**CERCA IIT DELHI EXPERT TALK SERIES**

**SURVIVAL, INNOVATION AND PROFIT ON THE FRONTLINES OF CLIMATE CRISIS**

TUESDAY | MARCH 29, 2022 | 4:30 PM, IST

Simon Mundy, Moral Money Editor, Financial Times, New York

Author of the Best Selling Book "Race for Tomorrow", an account of his journey exploring the global fight to respond to climate change, across 25 countries on six continents

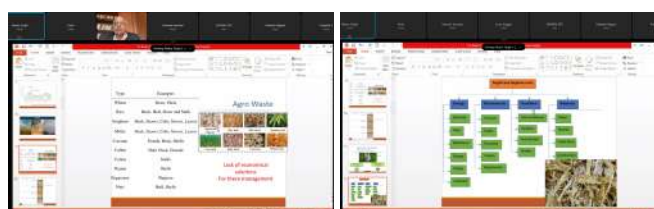
Hosted by:- Arun Duggal Centre of Excellence for Research in Climate Change and Air Pollution, IIT Delhi

To register for this March 2022 Talk Series, [Click here](#)



Expert Talk delivered by [Professor Neetu Singh](#) on 24th February 2022

[Prof. Neetu Singh](#) delivered a talk on “**Valorization of Agro Waste: A Burning Question**” on 24th February 2022. There was a discussion on the technology that allows valorization of agro waste. Since the collection of this agro waste is a huge cost to the farmers, this burning of agro waste in the states of Haryana, Punjab & Rajasthan often causes air pollution. The startup at IIT Delhi, Kriya Labs have developed a process of converting agro waste into pulp which can be used to manufacture sustainable packaging solutions like biodegradable tableware, rigid boards, etc. Additionally, they have set-up a commercial pilot unit at IIT Delhi and are looking forward to implementing on a large scale, to make a dent in the air pollution scenario.



If you have missed this event, the link below will direct you to the recorded video.

[Watch the complete Expert Talk Series Here.!](#)



## Assessment of household air pollution exposure of tribal women

*Pradip Mitra, Deep Chakraborty, Naba Kumar Mondal*

- This study estimated the gaseous pollutants (CO, CO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>) and particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) during the burning of biomass and liquefied petroleum gas (LPG) fuels and their impacts on the health of tribal women.
- The results revealed that the concentration of gaseous and PM was recorded as in the order of CO<sub>2</sub> > SO<sub>2</sub> > CO > O<sub>3</sub> and total suspended particulate matter (TSPM) > PM<sub>10</sub> > PM<sub>2.5</sub>, respectively.
- The correlation study showed that tribal women who were exposed to biomass smoke were in a more vulnerable position than those who used LPG.
- The biomass using tribal women might be suffering from higher cardiovascular risk than LPG users.
- Modelling study also revealed that exposure of duration and cooking time are extremely important for toxicological risk assessment. However, further long-term comprehensive studies are extremely important.

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## Health impact assessment of Delhi's outdoor workers exposed to air pollution and extreme weather events: an integrated epidemiology approach

*Vaishnavi Barthwal, Suresh Jain, Ayushi Babuta, Chubamenla Jamir, Arun Kumar Sharma & Anant Mohan*

- This study is an assessment of the effects of outdoor air pollution and extreme weather events on the health of outdoor workers in Delhi, including auto rickshaw drivers, street vendors, and sweepers.
- A cross-sectional and perception-based epidemiological research design was used, and the primary tool used for data collection was a questionnaire.
- Autorickshaw drivers reported the highest prevalence of ophthalmic symptoms, such as eye redness (44%) and eye irritation (36%). In comparison, vendors reported a higher prevalence of headaches (43%) and eye redness (40%) due to increased exposure to vehicular emissions. Among sweepers, musculoskeletal problems like joint pain (40%), backache (38%), and shoulder pain (35%) were most prevalent due to occupation-related ergonomic factors. In addition, the majority of autorickshaw drivers (47%), vendors (47%), and sweepers (48%) considered that air quality had a severe impact on their health.
- The odds ratio for smoking, which was around 4, indicated that respondents who smoked had a nearly four times greater risk of developing lung impairment.
- The study also highlighted the need for using personal protective equipment and developing guidelines to reduce their exposure level.

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## Association between personal exposure to household air pollution and gestational blood pressure among women using solid cooking fuels in rural Tamil Nadu, India

*Wenlu Ye, Gurusamy Thangavel, Ajay Pillarisetti, Kyle Steenland, Jennifer L. Peel, Kaipana Balakrishnan, Shirin Jabbarzadeh, William Checkley, Thomas Clasen*

- The Household Air Pollution Intervention Network (HAPIN) trial is an ongoing multi-center randomized controlled trial assessing the impact of a liquified petroleum gas (LPG) cookstove and fuel intervention on health.
- Multivariable linear regression models were used to examine the association between 24-h personal exposure to PM<sub>2.5</sub>/BC/CO and systolic and diastolic blood pressure, controlling for maternal age, body mass index (BMI), mother's education, household wealth, gestational age, and season. At the time of measurement, women were between 9- and 20-weeks of gestation.
- It was found that systolic blood pressure (SBP) and diastolic blood pressure (DBP) were higher in pregnant women exposed to higher levels of HAP, though only the result for CO and DBP reached conventional statistical significance ( $p < 0.05$ ) and observed a positive association between CO and DBP among the entire study cohort.
- Results from this cross-sectional study suggest that exposures to PM<sub>2.5</sub> and CO from solid fuel use are associated with higher blood pressure in pregnant women during their first or second trimester.

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### Budget 2022-23: Incentives for solar, green bonds in low carbon plan

Climate crisis is among the strongest negative externalities to affect India hence several steps were announced that would help the country transition to a low carbon economy. additional allocation of ₹19,500 crores for Production Linked Incentive (PLI) for manufacture of high efficiency solar modules to fully integrated manufacturing units that can transition from polysilicon to solar PV modules. This is to facilitate domestic manufacturing for implementation of 280 GW of installed solar capacity by 2030. The finance minister also announced sovereign Green Bonds under the government's overall market borrowings in 2022-23, which will be used to mobilize resources for green or climate-friendly infrastructure. The proceeds from these bonds will be deployed in public sector projects that help in reducing the carbon intensity of the economy.

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### How wetlands can help fight climate change?

February 2 is marked globally as World Wetlands Day. The rates of wetland loss are still exceeding the rates of loss of terrestrial ecosystems. The quality of remaining wetlands is suffering due to drainage, pollution, invasive species, unsustainable use, disrupted flow regimes and climate change. According to findings by the Ramsar Convention, land-use change has been the biggest driver of degradation to inland wetlands since 1970, driven by population growth and, conversely, by the growing need for agricultural land. Long-term carbon sequestration rates in wetlands are up to 55 times more efficient than tropical rainforests. "Blue carbon" captured by living organisms in coastal and marine ecosystems and stored in biomass and sediments has been recognized by the IPCC as having a dual role in providing both climate mitigation and adaptation.

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### Climate change takes its toll on human health in the state of Bihar too

Drastic climate change in Bihar, like other parts of the country and the world, has become a matter of concern. According to health experts, such change in climate is taking a toll on human health and leading to an increase in the number of cancer and diarrhoea cases. Climate change was clearly visible even this year in Bihar as the winter season shifted till the first week of February which had never been experienced earlier. Almost all the places in the state are witnessing hotter summers as well as colder winters and unpredictable rainfall. According to the World Health Organization (WHO), climate change is expected to cause additional 2.50 lakh deaths per year from malnutrition, diarrhoea and heat stress between 2030 and 2050.

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### India among the countries who face the maximum brunt of climate change: IPCC report

Indian cities are facing the climate impacts already in the form of coastal and inland flooding as well as water scarcity and urban drought. India with its growing economy and energy needs for a vast population faces many challenges. The report highlights the wet bulb temperature – a measure that combines heat and humidity – and warns that in India cities like Lucknow and Patna can reach a wet bulb temperature of 35 degree if the emissions continue to rise. Besides facing the threat of sea level rise, which may drown the coastal cities like Mumbai, Kolkata and Chennai, climate change will pose a serious threat to food security as factors like prolonged drought, hailstorms and flooding caused by extreme rainfall and frequent cyclones are destroying the crops. The recent IPCC report confirms that climate change is causing a serious blow to India's GDP.

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### Extreme Climate Conditions Can Cause Mental Health Issues, Says IPCC Report

The latest Intergovernmental Panel on Climate Change (IPCC) report on climate change released on Monday said that extreme climate conditions can cause mental health issues like anxiety, depression, acute traumatic stress and sleep problems ranging from mild to severe which may even require hospitalisation. The report, titled 'Climate Change 2022: Impacts, Adaptation and Vulnerability', warned that a wide range of climate events and conditions will have detrimental effects on mental health. The report also said



### Pollutionwatch: concerns over ultrafine particles from aircraft

Ultrafine particles are far smaller than the wavelength of light and it is not just a problem in the skies above us. The number of ultrafine particles 500 meters downwind of the airport was greater than those at the curb of London's busiest roads. They mostly came from aircraft during takeoff and landing, but traffic, car parks and a large catering facility used to cook airline food all added to the problem according to the study released in Environment International. Growing evidence suggests tiny particles can affect

that a systematic review of published research using a variety of methodologies from 19 countries found increased risk of suicide associated with a one degree Celsius rise in ambient temperature.

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the heart, lungs, blood pressure and risk fetal growth.Ultrafine particles are not included in the environmental assessments, putting us at risk of increased air pollution for decades to come.

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