Dear Readers,

National clean air Program (NCAP) just reached four years of its inception as India’s biggest ever clean air management program. Government has already spent a whopping 7000 Crs for air pollution management in 131 non-attainment cities ever since its launch. At the time of its launch in 2019, the NCAP targeted a reduction of 20-30 per cent by 2022 in ultra-fine PM matter levels in non-attainment cities which was later modified to a 40 per cent reduction in PM levels by 2026.

However, even in 2022, PM levels recorded in most of non-attainment cities were much higher than the CPCB’s annual average safe limits. Delhi ranked as the most polluted city in 2022 among the non-attainment cities in India with Indo-Gangetic plain (IGP) recording the top ten most polluted cities in India.

There is a need to critically evaluate NCAP progress till date. Apart from an air shed approach for better air quality management beyond Delhi, there is also a need to focus efforts on short term prioritized solutions like augmenting enforcement capacity of PCBs and increasing their accountability. At the same time, for the longer term, efforts must also be directed towards governance reforms.

Air pollution is a complex issue resulting from multiple sources at different regional scales under different agencies thereby requiring a variety of mitigation measures. In order to manage this complex issue, we require a more systematic approach rather than a reactive approach that has been adopted so far. We also need to unambiguously accept the terrible health impacts of air pollution by adopting an evidence based approach and deal with each one of these big sources of pollution with a keen sense of urgency.

Best Regards

Hemant Kaushal
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The graph above shows the daily average PM$_{2.5}$ for the month of March 2023. Amongst the major metros worldwide, Dhaka has shown the highest concentration of PM$_{2.5}$ followed by Kolkata and Delhi. In India, Delhi, Mumbai, and Kolkata rank among the topmost polluted cities worldwide.

**Delhi PM$_{2.5}$ (24 hr. daily average) Trend**
March 2022 Vs 2023

Between March 2022 and March 2023, Delhi’s air quality improved significantly. Meteorological conditions such as rainfall played an important role in cleaning the air this year. Meanwhile, PM2.5 levels fell by 22.87 g/m³ on average in March 2023 compared to March 2022. According to data shared by the Commission for Air Quality Management, Delhi recorded ‘good’ to ‘moderate’ air quality on 35 days in the first quarter of 2023, the most in the corresponding period in six years, barring 2020, when coronavirus caused a strict lockdown (CAQM).

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.

To register for this April 2023 Talk Series, Click here

Expert Talk delivered by Tanushree Ganguly on 27th March 2023

On 27th March, 2023, Tanushree Ganguly delivered a talk on "India’s NACP and its Implications For Clean Air in India". She discussed her work filling data gaps and assisting with regional or sub-regional implementation. She also emphasised the importance of transforming citizens into change agents as part of her work. She discussed the NCAP's various components and how it has improved city-level clean air planning. She provided an update on how NCAP has evolved over the last four years.

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

Click here to watch

Moving forward towards achieving key milestones under the AQAF initiative, the Air Quality Action Forum, Annual Conference, 2023, was successfully organized (in hybrid mode) in a two-day event on the 27th & 28th February 2023. Aligned to the Government of India’s vision on addressing air quality, the findings from the needs assessment were shared and the modality of the resource centre was discussed, underpinning AQAF to support the Government in the implementation of the National Clean Air Programme. The two-day event underscored the identified opportunities for strengthening air quality management in India.
The Arun Duggal Centre of Excellence for Research in Climate Change and Air Pollution (CERCA) at IIT Delhi is assisting UNEP in implementing activities envisaged under the AQAF. Along with the (CERCA) at IIT-Delhi, UNEP has successfully involved 100+ organizations under the aegis of the Air Quality Action Forum (AQAF). Therefore, CERCA is officially inviting the different stakeholders to join the AQAF as a Forum member to register and know more about its future activities.

Kindly use this button below to register:

Register here

CERCA Expert Opinion and Research Outcomes

Air Pollution and Cardiovascular Disease Burden: Changing Patterns and Implications for Public Health in India
S. Sajith Kumar PhD, Akhil Sasidharan MPH, Bhavani Shankara Bagepally

- The study examined the association between the status and trends of the APACVD (air pollution-attributed cardiovascular disease) burden obtained from the Global Burden of Diseases and Injuries study
- The two development metrics in India were: human development index (HDI) and indirect indices of economic development, namely annual new motor vehicle registration and the number of functional factories for 10 years from 2009 to 2019.
- Lorenz curves and concentration index were used to estimate the inequalities in the state-APACVD burden and the burden per 100,000 population.
- It was observed that at the state level, the APACVD burden was inversely related to HDI. But the APACVD burden increased with the country’s economic development.
- Also, the excess APACVD burden appears to be attributable to the economically developed states.

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Understanding the influence of summer biomass burning on air quality in North India: Eight cities field campaign study
Khaiwal Ravindra, Tanbir Singh, Vikas Singh, Sudheer Chintalapati, Gufran Beig, Suman Mor

- This research studied real-time air pollutants’ levels during the Rabi crop residue burning in 8 cities.
- Semi-urban sites have the highest average concentration of particulate matter and VOCs.
- Higher NH3 concentrations in rural sites were linked with agricultural use of fertilizers.
- HYSPLIT analysis showed 22 %–70 % air masses originate from the Rabi residue burning region.
- This multi-city study observed that Mixed emission sources (residue burning, vehicular, industry) degrade IGP air quality.

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Black Carbon Emissions from Traffic Contribute Sustainability to Air Pollution in Urban Cities of India
Ali Jaan Hussain, Tapan Kumar Sankar, Meththika Vithanage, Balram Ambade & Sneha Gautam

- A comprehensive investigation of BC concentration and its source apportionment distribution in the atmosphere of three traffic sites in East India was conducted using the portable Aethalometer.
- The results showed that concentrations of BC ranged from 2.48 to 47.57 μg m⁻³ were minimum in Ranchi (RNC, 10.39 ± 2.48 μg m⁻³) and maximum in Jamshedpur (JSR, 18.22 ± 10.76 μg m⁻³).
- This was attributed to a high volume of traffic and a dense population in JSR compared to other sites.
- The airborne particulate particles arrived from various directions, as evidenced by backward trajectories.
- According to the diagnostic ratio analysis of BC, it was observed that the highest contribution of fossil fuel was reported at DHN (57%) and the highest contribution of biomass burning was reported at RNC (53%).
India contributed 4.8% to the climate crisis, says a new research paper

According to a new study published in the journal Nature, India has contributed 4.8% of the change in global mean surface temperature (GMST) caused by historical CO2, methane, and nitrous oxide emissions (N2O). Since 1850, the following countries have contributed the most to global warming: the United States (0.28°C); China (0.20°C); Russia (0.10°C); Brazil (0.08°C); India (0.08°C); Indonesia, Germany, the United Kingdom, Japan, and Canada (each contributing 0.03-0.05°C).

Why the Elderly Population in India Is Vulnerable to Climate Change and How To Protect Them

Senior citizens face unique climate change challenges because they are frequently more vulnerable due to limited mobility, chronic health conditions, and limited access to resources. The level of protection required varies depending on location, but generally includes access to clean air, safe drinking water, dependable energy sources, and assistance during extreme weather events. Age-related physiological changes make older adults more vulnerable to the effects of climate change, such as decreased ability to regulate body temperature and increased susceptibility to heat stress.

BMC plans environment and lung health institute

The BMC committee in charge of recommending dust mitigation measures through its Air Pollution Mitigation Plan has proposed the establishment of an institute to address the health, environmental, and climate change issues caused by air pollution. An action plan is required to address the growing disease burden in Mumbai and other cities throughout the state. According to the report, the institute should focus on both preventive and curative measures to combat this problem.

Some Animals Could Play a Key Role in Fighting Global Warming

A group of researchers studied nine species in particular and discovered that they aid in carbon capture and storage. The study, which was published in the journal Nature Climate Change, was carried out by 15 scientists from eight different countries. Marine fish, whales, sharks, grey wolves, wildebeest, sea otters, musk oxen, African forest elephants, and American bison were all studied. The conservation of these species and their habitats has the potential to capture 6.41 billion tonnes of CO2 per year. These tonnes could help to keep global warming below the 1.5-degree Celsius threshold set by the Paris agreement.
Rising Antarctic ice melt will dramatically slow global ocean flows, study says: Why this matters

According to new research, rapidly melting Antarctic ice is dramatically slowing the flow of water through the world's oceans, which could have disastrous consequences for the global climate, the marine food chain, and even the stability of ice shelves. The oceans’ "overtturning circulation," which is caused by the movement of denser water towards the sea floor, aids in the delivery of heat, carbon, oxygen, and vital nutrients around the world.

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Climate change: trees grow for an extra month as planet warms - study

According to researchers studying hardwoods in northwest Ohio, a century of warming has increased their annual growing season by a month on average. Ohio State University scientists compared recent observations to detailed notes taken by a local farmer in the nineteenth century. According to the researchers, the study has implications for how different types of trees will cope with future climate change. However, they warned that higher, fluctuating temperatures could stress trees in previously unknown ways. Different species responded differently to higher temperatures.

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