Stubble burning- Will 2022 be better?

Dear Readers,

With the paddy-harvesting season almost at hand, it remains to be seen how the northern rice-growing states implement a workable strategy to prevent farmers from burning crop stubble. Paddy stubble burning in Punjab and Haryana post-harvest is one of the major causes for the spike in air pollution levels in the NCR in October and November each year. A range of solutions are being offered such as spraying microbial stubble decomposer on the harvested paddy fields, massive awareness drives in villages, distribution of thousands of crop residue management machines including the launch of an ‘i-Khet’ app to provide details on CRM machines availability to facilitate farmers to book them on rent. In addition, plans are there to engage NGOs, students, and religious places to fight paddy stubble burning during the upcoming harvest season. For achieving success in this important area, a detailed micro-level action plan must be in place to ensure subsidizing of CRM machines to farmers and their effective utilization, encourage and promote bio-decomposer spraying to complement CRM machines along with ex-situ straw utilization through demand mapping from adjoining industries like biomass-based power plants, bioethanol plants, etc. and take up intensive mass farmer awareness campaigns through village camps, electronic/print & social media, with the involvement of all stakeholders in this sector. However, the litmus test for the success of the above measures would be the reduction in the number of fire incidents on the ground and the resultant drop in air pollution levels in the NCR during winter.

Hemant Kaushal
Pr coordinator
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Indian & International Cities- September 2022

Dhaka has the highest pollution levels

The graph above shows the daily average PM$_{2.5}$ for the month of September 2022. Amongst the major metros worldwide, Dhaka has shown the highest concentration of PM$_{2.5}$ followed by Delhi and Beijing. Delhi and Kolkata, within India, rank among the topmost polluted cities worldwide.

Delhi PM$_{2.5}$ (24 hr. daily average) Trend
September 2021 Vs September 2022

Poor air quality was observed in September 2022, and it was linked to increased pollution brought by dry northwesterly winds flowing toward Delhi-NCR, which also transport dust and raise the temperature. This winter's air quality is anticipated to be affected by the monsoon's earlier departure from Delhi than it did last year. In addition to these, a long-running decline in COVID-19 cases resulted in an increase in social gatherings and anthropogenic activities whose impact is visible on the Delhi Air Quality, which can be clearly correlated and observed in the graph. Hence, PM$_{2.5}$ was increased by 7.32 µg/m$^3$ on average in September 2022 as compared to September 2021.
To register for this October 2022 Talk Series, Click here

Expert Talk delivered by Ritesh Bhatia on 30st September, 2022

On September 30th, 2022, Ritesh Bhatia delivered a talk on "Stubble Burning - What to expect in the coming month?" He spoke about the upward trend in stubble burning and also discussed the various pollution-reduction strategies that are available, as well as the challenges associated with their implementation. He further addressed the economic benefits of partial burning with machine sowing and the effectiveness of the machines on the ground.

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

Watch the complete Expert Talk Series Here!

Addressing the Air Quality Challenges in National Capital Territory through Indo-Swedish Cooperation on 22nd September, 2022

Team Sweden (Embassy of Sweden and the Swedish Trade and Invest Council - Business Sweden) and IIT-Delhi discussed the current air quality situation in the National Capital Territory (NCT) of Delhi and identified possible areas of joint intervention, facilitated by CERCA, IIT Delhi. Participating Indian startups (Airveda, Airth, Chakr innovations, Swachh.io, Tadpole projects, Cleanos LLC, Umeandus Technologies, Omniion) and Swedish companies (Camfil India, Clean Motion India, Ericsson India, Munters India, Systemair India, Volvo Group, SenseAir) showcased best practices in air quality management and discussed various aspects of poor air quality in Delhi. Different technological interventions (monitoring, protecting, and preventing air pollution) and various possible areas of collaboration were identified. Plans for joint awareness campaigns across schools/education institutes and possibilities of joint R&D and co-development of technological solutions that are able to address issues at the local level were discussed. The conference also explored matchmaking of startups under the IIT Delhi umbrella with Swedish technology companies for accelerated commercialization and market deployment.
An Air Quality Action forum (AQAF) has been launched by UNEP to bring together relevant stakeholders on a common platform to support GOI in creating actionable work in synergy to improve air quality in India and also work towards meeting India’s air pollution management targets, especially that of the National Clean Air Programme (NCAP) in a cohesive, planned, robust and inclusive manner. The various stakeholders are the regulators, national, and international philanthropic organizations, international development agencies, expert institutions, the corporate sector, and the UN system of organizations. CERCA is collaborating with UNEP as a lead expert institution to provide expert technical advice through data and analysis to the forum for devising concrete work plans.

On the occasion of International Day, on 7 September 2022 the PayTM and UN Environment Programme supported Air Quality Action Forum (AQAF), in collaboration with the Natural Resources Defense Council (NRDC) and the International Forum for Environment, Sustainability, and Technology (iFOREST), hosted an event at India Habitat Centre. The event focused on issues that resonated with the theme of this year’s Clean Air Day, including, building capacities in India for air quality management, while also underscoring the progress made and the future opportunities for improvement. AQAF is a first-of-its-kind initiative, bringing together stakeholders from diverse sectors, including private actors, international organizations, and government on a common platform with the aim of collectively spearheading the agenda of inclusive air quality management (AQM) in India.

Projecting the impact of air pollution on child stunting in India—synergies and trade-offs between climate change mitigation, ambient air quality control, and clean cooking access

Asya Dimitrova, Guillaume Marois, Gregor Kiesewetter, Peter Rafaj, Shonali Pachauri, Samir KC, Sergio Olmos, Davide Rasella and Cathryn Tonne

- Researchers developed a static microsimulation model to project the air pollution-related burden of child stunting in India up to 2050 under four scenarios combining climate change mitigation (2°C targets) with national policies for AAP control and subsidized access to clean cooking.
- They linked data from a nationally representative household survey, satellite-based estimates of fine particulate matter (PM2.5), a multi-dimensional demographic projection, and PM2.5 and clean cooking access projections from an integrated assessment model.
- It was found that the positive effects on child linear growth from reductions in AAP under the 2°C Paris Agreement target could be fully offset by the negative effects of climate change mitigation through reduced clean cooking access.
- Targeted AAP control or subsidized access to clean cooking could shift this trade-off to result in net benefits of 2.8 or 6.5 million cumulative prevented cases of child stunting between 2020–50 compared to business-as-usual.
Findings underscore the importance of complementing climate change mitigation efforts with targeted air quality and energy access policies to concurrently deliver on carbon mitigation, health and air pollution, and energy poverty reduction goals in India.

The burden of premature mortality from coal-fired power plants in India is high and inequitable

Dweep Barbhaya, Vittal Hejjaji, Aviraag Vijayaprakash, Amirarsalan Rahimian, Aishwarya Yamparala, Shreyas Yakkali, Abilash Muralidharan and Aditya K Khetan

- This study used a national, district level dataset to assess the impact of coal-fired power plants on all-cause mortality (15–69 years) in 2014.
- It compared districts with coal-fired power plants (total capacity >1000 MW) to districts without a coal-fired power plant, estimating the effect of these power plants on all-cause mortality within districts that have these plants. Out of 597 districts in India in 2014, 60 districts had a coal-fired power plant.
- When compared to districts without a coal-fired power plant, districts with a coal-fired power plant (>1000 MW) had higher rates of age-standardized mortality in both women and men.
- In affected districts, the proportion of premature adult deaths attributable to coal-fired power plants was 5.8% (−0.3%–11.9%) in women and 4.3% (−1.1%–9.6%) in men.
- This study estimated that ∼47 000 premature adult deaths can be attributed to large coal-fired power plants in India in 2014. These deaths are concentrated in the ~10% of districts that have the nation's power plants, where they are associated with 1 out of 20 premature adult deaths.

Climate change increases global risk to urban forests

Hans Orru, Henrik Olstrup, Jaakko Kukkonen, Susana López-Aparicio, David Segersson, Camilla Geels, Tanel Tamm, Kari Riiukonen, Androniki Maragkidou, Torben Sigsgaard, Jørgen Brandt, Henrik Grythe & Bertil Forsberg

- The current study showed that 56% and 65% of species in 164 cities across 78 countries are currently exceeding the temperature and precipitation conditions experienced in their geographic range, respectively.
- They assessed 3,129 tree and shrub species, using three metrics related to climate vulnerability: exposure, safety margin, and risk.
- By 2050 under Representative Concentration Pathway 6.0, 2,387 (76%) and 2,220 (70%) species will be at risk from projected changes in mean annual temperature and annual precipitation, respectively.
- Risk is predicted to be greatest in cities at low latitudes—such as New Delhi and Singapore—where all urban tree species are vulnerable to climate change.
- These findings aid the evaluation of the impacts of climate change to secure long-term benefits provided by urban forests.
- Climate change threatens the health and survival of urban trees and the various benefits they deliver to urban inhabitants.

Increased e-buses in Delhi could reduce pollution-related mortality, morbidity: study

A recent study by researchers at the Kyushu University in Japan finds that by

Farming becomes tough in Himachal’s cold desert with changing climate and crop pattern

Agriculture in Himachal Pradesh’s cold desert is imperiled by depleted snow melt water affecting irrigation. As many
transitioning the existing fleet of Delhi’s buses to electric buses, it could reduce 74.67 percent of the total pollutant emissions from the existing fleet. The study noted that with e-buses, there could be a total reduction of 44 tonnes of Particulate Matter (PM 2.5) per year and 1370 cases of avoided mortality and 2808 cases of avoided hospital admissions annually. Loss of productive time on charging and deterioration of batteries over time continue to affect the potential benefits of electrification of public transport in the national capital.

Pollution Combined with CO2 Emissions Can Raise the Societal Cost of Carbon by up to 66%

According to a new study, the effects of air pollution on human health, economies, and agriculture vary dramatically depending on where the pollutants are produced in the world. The study, led by The University of Texas at Austin and the University of California San Diego, is the first to mimic how aerosol pollution impacts both climate and air quality for areas throughout the world. It was published in Science Advances. In certain circumstances, pollution co-emitted with CO2 can increase the societal cost of carbon by as much as 66%.

Scientists find clues to how air pollution may trigger lung cancer

Scientists have long known that air pollution can be linked with an increased risk of lung cancer in people who never smoked, but new research describes one mechanism that might help explain how. The findings, presented at the European Society for Medical Oncology Presidential Symposium in Paris, suggest that air pollution can trigger lung cancer in people with no history of smoking because some air pollutant particles may promote changes in cells in the airways (rapid changes in airway cells as 76 villages in the Lahaul and Spiti districts of the state have been hit by drought this year, causing crop losses between 50%-100%. A study, calls for exploring new ways of sustainable agriculture practices and highlights the shift in cropping patterns to more water-intensive cash crops that put pressure on already depleted irrigation resources and for exploring water-saving irrigation methods in Lahaul and Spiti besides introducing new varieties of crops with greater tolerance towards drought conditions.

Non-communicable diseases led to 66% of deaths in India in 2019: WHO

In India, 66 per cent of total deaths were due to NCDs in 2019, a new WHO report: ‘Invisible numbers – the true scale of non-communicable diseases’ stated. The report further revealed that there was a 22 per cent probability of death between the age of 30 and 70 due to any type of non-communicable disease, including cardiovascular diseases, cancer, diabetes or chronic obstructive pulmonary disease. The World Health Organisation (WHO) has also launched a portal, which, for the first time, brings together all WHO data related to NCDs for 194 countries.

Climate action, and pollution control needed to keep sulfur dioxide in check

The concentration of sulfur dioxide, an atmospheric pollutant with health and climate impacts, shows a decreasing trend in India in the recent decade (2010-2020) compared to previous decades, according to trend analysis. Even if the growth of sulfur dioxide concentration has stabilized in the recent decade, the amount of concentration is still high, and India continues to be the largest emitter of the pollutant. technology and environmental regulations have played a significant role in the reduction in that trend. The study by lead author and climate scientist
that have mutations in a gene called EGFR, which are seen in about half of people with lung cancer who have never smoked, and another gene linked to lung cancer called KRAS.

Jaynarayanan Kuttipurath, used data from MERRA-2 of NASA and Copernicus Atmosphere Monitoring Service (CAMS) set of satellites and airborne instruments. India is considered the largest SO2 emitter in the world, according to a 2019 analysis by Greenpeace.

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