Press Release

India Clean Air Summit #ICAS2024

Bengaluru, 27 August 2024

Heading 1. At India Clean Air Summit 2024, scientists call to plug big gap in pollution data

Heading 2. How can air sensors be effectively used to improve air quality?

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Key takeaways

- 6th India Clean Air Summit (ICAS) underway in Bengaluru
- 99% of the world's population exposed to air pollution exceeding WHO's guideline
- Low-cost sensors can fill in data gaps
- South–South–North collaboration key to enhancing sensor data
- Scientists call for a community of experts to set standards for harmonising data
- Over 300 attendees participated at ICAS 2024, in-person and virtually

B-roll video for TV and digital news desks:
https://www.youtube.com/watch?v=vrSlvjvbcyE

Speaking at the opening plenaries of ICAS+CAMS-Net 2024, Prof V Faye McNeill from Columbia University said, 'Air pollution is a threat to public health across the world, and it's shortening human life in most locations, but especially in many of the most populated parts of the world, including Africa and Asia'. She added, 'In Karnataka, which is relatively clean, the average life expectancy is shortened by 2 years due to exposure to air pollution. In North India, of course, the problem is more severe'.

The Center for Study of Science, Technology and Policy (CSTEP) is hosting its flagship event on air pollution, 'India Clean Air Summit (ICAS) 2024', in

partnership with the Clean Air Monitoring and Solutions Network (CAMS-Net) from 26 to 30 August 2024 in Bengaluru.

There is no denying that air pollution is a major health issue in India, and more monitoring is needed to identify air pollution hotspots. 'India is doing a great job of rolling out government-based monitoring, at least in major cities. And this is totally necessary. Of course, it's a huge country. The coverage is not quite getting to all the rural areas, and some states have less (coverage) than others. There is not necessarily enough data to identify sources in a hyperlocal manner. This is where low-cost sensing comes in', emphasised Prof McNeill.

Dr R Subramanian, Head, Air Quality Sector, CSTEP, said that air sensors and lower-cost analytical techniques can effectively complement traditional monitoring. 'We're not saying they replace regulatory monitors, but we can actually fill in data gaps. They can help validate and improve our air quality models', he added. These sensors need standardised evaluation protocols and transparency, especially in terms of algorithms. Manufacturers often provide algorithms that are hidden or in a black box, necessitating transparency around this.

Dr R Subramanian, Head, Air Quality Sector, CSTEP, speaking at the opening plenaries at ICAS+CAMS-Net 2024

To watch an excerpt from Dr Subramanian's speech, please click here:

https://www.youtube.com/watch?v=xX94KhjAXI0

Prof V Faye McNeill from Columbia University speaking during ICAS+CAMS-Net 2024

To watch an excerpt from Prof McNeill's speech, please click here:

https://www.youtube.com/watch?v=9FfzgLyol9o

Dr Allison Hughes, Senior Lecturer, University of Ghana, highlighted the importance of the ongoing collaboration between the Global South and Global North in reducing air pollution. Citing the air quality Sensor Evaluation and Training centre for West Africa (Afri-SET), which was set up to evaluate sensors from across the world and to facilitate capacity building of students and practitioners, he highlighted that this should be replicated in other parts of Africa.

Given their affordability, portability, and ease of installation, low-cost sensors can provide air quality information in areas with little to no monitoring. However, for utility beyond qualitative characterisation, low-cost sensor data need more processing and calibration.

Heading 2. How can air sensors be effectively used to improve air quality?

Key takeaways

- Scientists at ICAS 2024 highlight the need for bridging data gap in air pollution studies
- Air quality scientists endorse low-cost sensors to complement government monitors
- Low-cost air sensor manufacturing in India is growing
- Community of experts need to come together to set standards

Several scientists at the India Clean Air Summit 2024 backed low-cost sensors as an important solution to enhancing data-based air quality monitoring but with some caution. With multiple manufacturers and models in this growing market, how do you choose the best sensor for your needs? Is cost important or the brand? Does the location where it was calibrated matter? What else goes into the assessment and selection of the best sensor for your needs?

With these questions, Ms Swagata Dey, Policy Specialist in the Air Quality Sector at CSTEP, set the tone for the panel discussion on ranking low-cost sensors.

Deteriorating air quality is a serious concern across the world, but its effects can be worse at the hyperlocal level. One of the biggest challenges in managing air quality and framing policies to address the issue is the lack of data.

Traditionally, air quality is monitored using reference-grade monitors—large, expensive machines tracking the concentration of pollutants and thus the quality of air. While the data provided by reference-grade monitors are accurate, their high cost limits the number of monitors that countries can set up, especially in the case of poor or developing regions. In this context, the debate on low-cost sensors becomes relevant.

The low cost of air sensors makes them much more accessible. But the question is, can we depend on them and trust their data?

Organisations such as CSTEP, AfriSET, and others are attempting to address this challenge by setting up evaluation centres where the performances of low-cost sensors are compared with reference-grade monitors over a period of time.

‘Standardisation is key’, said Dr Mike Giordano, Executive Director of AfriqAir and Coordinator of Afri-SET. ‘Standardised testing methods and metrics are necessary for current and future evaluation centres. We as a community need to define these sooner not later’, he added, in the context of AfriqAir’s study assessing the performance of low-cost sensors in Accra, Ghana.

Dr Mike Giordano, Executive Director of AfriqAir and Coordinator of Afri-SET, speaking during ICAS+CAMS-Net 2024

CSTEP’s evaluation of the performance of low-cost sensors from six Indian manufacturers has revealed significant differences in the data. Based on the evaluation, CSTEP has developed local calibration models, which improved the performance of sensors detecting nitrogen dioxide and ozone levels in the atmosphere. Highlighting the importance of these findings, Emil Varghese, Senior Analyst in the Air Quality team at CSTEP said ‘India’s climate conditions and geographical features vary across the country. We need localised calibration because sensors are affected by the environment they are exposed to.’

Low-cost air quality sensors are referred to as ‘microsensors’ by Airparif and simply ‘air sensors’ by the US EPA.

‘The air sensor ecosystem is growing’, said Mr Adrian Arfire, Metrology Engineer, Airparif, the regulatory body responsible for monitoring air quality in Paris. ‘Not only do we have more numbers and more manufacturers, but this growth is being seen across the globe’, he said, stressing the huge differences in the cost and performance and the need for standardisation. Airparif has been evaluating the performance of different low-cost sensors through the Microsensors Challenge, which began in 2018.

The discussion on low-cost sensors highlighted how they can change the dynamics of air pollution monitoring, shifting from central detection points to decentralised local monitoring centres, which can empower residential welfare associations and cooperative housing societies to monitor air quality and take proactive measures to combat the problem. This will be a significant step in integrating public participation in environmental action.

During a session on 'Measuring air pollution in your neighbourhood', Prof Kofi Amegah, Project Lead of Breathe Accra, a community-driven initiative aimed at monitoring and improving air quality in the Greater Accra Metropolitan Area (GAMA) in Ghana, said 'Air pollution has overtaken tobacco and diet as a risk factor for health. This means that there is a cost to inaction. We need to step up our game to try and clean the air so we can protect the public health in our neighbourhood. Air pollution is also impacting children who are especially vulnerable'.

Media Contact

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About CSTEP: CSTEP is a not-for-profit research organisation with a mission to enrich policymaking with innovative approaches using science and technology for a sustainable, secure, and inclusive society. Our interdisciplinary research encompasses diverse fields such as energy, urban development, climate, and air pollution.

About CAMS-NET: The Clean Air Monitoring and Solutions Network (CAMS-Net) is a National Science Foundation-funded project aimed at creating an international 'network of networks' that will facilitate the exchange of knowledge, ideas, and data in order to improve the usage and application of low-cost sensor air quality data. Based at Columbia University, in collaboration with Carnegie Mellon University and Washington University at St Louis, CAMS-NET offers a unique platform for South–South–North collaboration on an equal footing.

About ICAS: Since its inception in 2019, the India Clean Air Summit (ICAS) has emerged as a platform for the community working on improving air quality in India, including government, academia, civil society organisations, and citizens, to collaborate and discuss important issues around air pollution.