



INDIA CLEAN AIR SUMMIT 2022



Looking at Air Pollution Through the Climate Lens

23-26 August 2022 | Radisson Blu Atria, Bengaluru

Supported by





INDIA CLEAN AIR SUMMIT (ICAS) - 2022

#ICAS2022

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FOREWORD

ವಿಜಯ್ ಮೋಹನ್ ರಾಜ್. ವಿ. ಎಫ್.ಎಸ್.,
ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿ
(ಜೀವಿಪರಿಸ್ಥಿತಿ ಮತ್ತು ಪರಿಸರ)
ಆರಣ್ಯ, ಜೀವಿಪರಿಸ್ಥಿತಿ ಮತ್ತು ಪರಿಸರ ಇಲಾಖೆ



Vijay Mohan Raj. V, IFS.,
Principal Secretary to Government
(Ecology and Environment)
Forest, Ecology and Environment Department

16/08/2022



Air pollution and climate change are two interrelated environmental challenges impacting the ecology. National Clean Air Programme (NCAP) launched by MoEFCC in 2019, is trying to address the challenge of air pollution and improve the quality of air in 132 Non-Attainment (NA) Cities in India. Ambient air pollution is a major health concern globally.

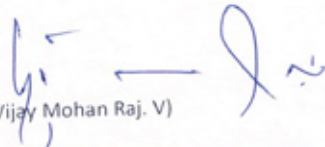
Karnataka has four NA cities and Bengaluru is one amongst them. The major challenge for bad air quality in these four NA cities is transportation, road dust, waste management and insufficient infrastructure development. Bengaluru is way ahead of the curve by conducting studies such as Emission Inventory (EI) and Source Apportionment (SA) which helped to understand the sources and various pollutants.

The Centre for Study of Science, Technology & Policy (CSTEP) is a not-for-profit policy-research organisation with a mission to enrich policymaking with innovative approaches, using science and technology for a sustainable, secure, and inclusive society. CSTEP's inter-disciplinary research encompasses diverse fields such as energy, urban development, climate, and air pollution.

The Centre for Air Pollution Studies (CAPS) at CSTEP has signed a MoU with Karnataka State Pollution Control Board (KSPCB), Bruhat Bengaluru Mahanagara Palike (BBMP) and the Government of Karnataka (GoK) to help towards the implementation of the control measures, build capacity of the various state departments and create awareness for air pollution challenges under the NCAP.

India Clean Air Summit (ICAS) is a step towards achieving better air quality by focussing on air-pollution issues and strategies towards clean air for all. ICAS will serve as a platform by bringing various experts from India and across the globe to showcase & deliberate on the best practices.

I wish ICAS a great success.


(Vijay Mohan Raj. V)

ಕೊಠಡಿ ಸಂಖ್ಯೆ: 709, 7ನೇ ಮಹಡಿ, 4ನೇ ಹಂತ, ಡಾ|| ಬಿ.ಆರ್. ಅಂಬೇಡ್ಕರ್ ವೀಧಿ, ಬಹುಮಹಡಿಗಳ ಕಟ್ಟಡ, ಬೆಂಗಳೂರು - 560 001
ದೂರವಾಣಿ: 080-2225 4377 / 2203 2445

Room No. 709, 7th Floor, 4th Stage Dr. B.R. Ambedkar Veedhi, Multistoreyed Building, Bengaluru - 560 001
Tel: 2225 4377 / 2203 2445 E-mail: secyenv-fee@karnataka.gov.in



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Dr Jai Asundi

Executive Director, CSTEP

Welcome to the 4th edition of the India Clean Air Summit!

We hope the discussions and sessions are revealing and are able to inform your work. We hope you make connections with other participants that will last a lifetime and above all make this part of your learning journey. For our sponsors and partners, a heartfelt gratitude for your support and we hope this year's Summit meets your expectations.

We face a significant challenge with regards to air pollution in our settlements. At the same time, the effects of climate change are upon us, impacting us every day. These multiple crises, fall in the category of 'wicked' problems. Hence, this calls for all of us to work together with a sense of purpose, agency, and urgency to find practical, implementable, and scalable solutions to address these challenges.

It is thus appropriate that the organising and technical committee of the India Clean Air Summit 2022 decided to choose the theme of 'Looking at Air Pollution through the Climate Lens', to discuss and examine the research and policy questions on issues where there are commonalities. We hope that the discussions at ICAS 2022 will reveal pertinent insights to direct our action.

This year, we are also happy to collaborate with the UC Davis Air Quality Research Center to bring to India its first Air Sensors International Conference (ASIC-India). The conference couldn't come at a better time. Sensors are becoming a game-changer in air pollution monitoring and management by empowering citizens and community groups. However, it is important that we understand the science behind them and are able to understand their limitations. At ASIC, participants will attend training sessions and will be among the first cohort of practitioners contributing to building a common vision for the application of sensor technology in monitoring air pollution.

We have tried to make this Summit more participative by inviting students to present their research/work on solutions to tackle air pollution, while at least 15 tech developers will present their technology solutions. The summit is divided into panel discussions that bring different perspectives and concerns to the fore; as well as deep dives, where a single issue is studied from multiple angles in the hope of finding comprehensive and holistic solutions.

The India Clean Air Summit is CSTEP's flagship event. We would like to use this opportunity to highlight our ongoing research to practitioners, communities, policymakers while also being advocates for solutions that are practical. This is the essence of CSTEP's work too - where science, technology and policy come together to find solutions for us to build a secure, sustainable, and inclusive society for all.





ABOUT
CSTEP



CENTER FOR STUDY OF SCIENCE, TECHNOLOGY & POLICY

About CSTEP

CSTEP is one of India's leading think tanks, with a mission to enrich policymaking with innovative approaches using science and technology for a sustainable, secure, and inclusive society. Our work is in the areas of climate, environment, sustainability, energy, and AI for social good. Our research leverages innovative technology-based ideas to solve developmental challenges.



**Climate, Environment &
Sustainability**



Energy & Power



AI & Digital Platforms



Strategic Studies



Policy Engagements

- Member, Low-Carbon Technologies Committee formed by NITI Aayog (with a focus on policy solutions for enabling a Green Hydrogen economy in India).
- Member- India Climate and Energy Modelling Forum convened by NITI Aayog for developing India's long-term strategies.
- Ministry of Environment, Forest and Climate Change (MoEFCC)
- NITI Aayog
- Ministry of New and Renewable Energy (MNRE)
- Governments of Karnataka, Andhra Pradesh, Bihar, and Madhya Pradesh
- Review Panel in the Clean Energy Ministerial
- Member of Science and Engineering Research Board, DST



Centre for Air Pollution Studies

Very few institutions in India combine scientific knowledge and techno-economic assessment of interventions for policy. CAPS uses an integrated approach to address this gap and provide high quality policy advice to improve air quality in India.



Vision

To provide scientific, high-quality policy advice for improving air quality in India and the South Asian region.



Aim

1. Develop a scientific knowledge base for solving policy issues related to air pollution.
2. Share knowledge and best practices with citizen groups to mitigate air pollution.
3. Build cooperation and partnerships among researchers and practitioners on the issue of air pollution.



Approach

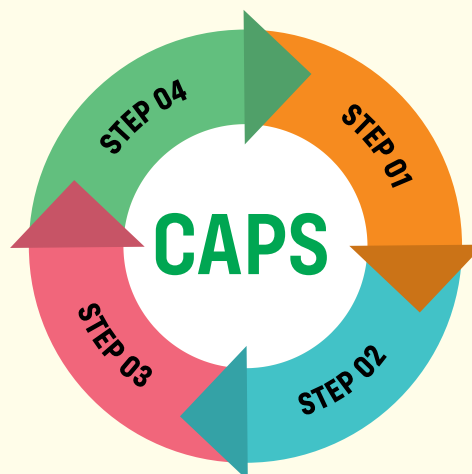
CAPS uses the following four approaches for conducting air pollution studies:

Capacity Building & Outreach

1. Scientific studies
2. Methodology and models
3. Communicating science

Policy Analyses

1. Techno-economic assessment
2. Health impact studies
3. Policy analysis



Measurement & Monitoring

1. Mobile & static measurements
2. Sensor network
3. Satellite measurements

Modelling & Analysis

1. Model development
2. Computational set-up
3. Storage facilities



Highlights

- CSTEP is a member of Air Pollution Measurement Consortium (APMU) of Technical Air Resource Unit (TARU) created by the Department of Science & Technology (DST)
- CSTEP is a member of Air Quality Action Forum (AQAF) initiative of the United Nations Environment Programme (UNEP) with support from Paytm Foundation
- CSTEP has been recognised as an Institute of Repute (IOR) by the Central Pollution Control Board (CPCB) under the National Clean Air Programme (NCAP)



INDIA

Clean Air Summit (ICAS-2022)

INDIA CLEAN AIR SUMMIT (ICAS) - 2022

Looking at Air Pollution Through the Climate Lens

23–26 August 2022 | Radisson Blu Atria, Bengaluru

The Center for Study of Science, Technology and Policy (CSTEP) is organising its annual flagship event 'India Clean Air Summit (ICAS) 2022', one of the largest events on air pollution in India. This event is being organised in collaboration with the Air Sensors International Conference (ASIC), UC Davis.

Concept Note

The India Clean Air Summit (ICAS)—CSTEP's flagship event on air pollution—has been instrumental in shaping the narrative and driving action on air quality in India. Organised by the Centre for Air Pollution Studies (CAPS) at CSTEP, the event embraces an integrative and holistic approach to improving India's air quality. Since 2019, ICAS has brought people across disciplines—scientists, policymakers, academicians, and civil society—together to facilitate meaningful discussions on challenges grounded in reality and solutions based on scientific evidence while leveraging the power of technology. Discussions at ICAS range across topics such as health, the socio-economic impacts of air pollution, innovative monitoring approaches, and reducing pollution. Further, these discussions pave the way to bridge gaps in policies.

The 4th edition of ICAS promises to be bigger and better than ever. This year, we have a hybrid four-day conference. Also joining ICAS this year is the UC Davis Air Quality Research Center (AQRC), with a mission to facilitate research on scientific, engineering, health, social, and economic aspects of gaseous and particulate atmospheric pollutants.

They would be bringing the Air Sensors International Conference (ASIC) to India for the first time. Over the last 6 years, ASIC has brought together stakeholders from academia, government, communities, and commercial interests to advance air pollution sensors, improve the data quality from sensors, expand the list of pollutants measured, and foster community involvement in monitoring air quality. ASIC aims to develop understanding and consensus between various stakeholders on the use of small, affordable air quality sensors.

At ICAS 2022, we will bring to the table two of the most pressing global issues of our time— climate change and air pollution. We will address the critical linkages between these and explore how working on these in tandem can help synergise policy decisions and make them comprehensive and more effective. Considering the urgency of the climate crisis and the health toll due to air pollution, we feel that this is the need of the hour. ICAS 2022, with ASIC, will examine these issues at research, policy, and engagement levels.

ICAS 2022 has something for everybody, and is, in fact, aimed at all practitioners working or interested in the areas of climate change and air pollution. Apart from engaging sessions for policymakers, scientists, and researchers, we have a Student Poster Competition, where 15 students from around the world will be selected to present innovative research ideas on the conference topics. Product developers are also invited to an exhibition, where 15 latest game changing technologies to curb air pollution will be displayed for demo. On the final day of ICAS 2022, ASIC will provide in-depth technical training to interested attendees.



AGENDA



DAY 1: 23 August 2022

The Right to Life: Citizens at the Centre of Science and Policy

Session 1	18:30-21:00	Inaugural address - Climate Change, Air Pollution, and Society Linkages
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DAY 2: 24 August 2022

Two Sides of the Same Coin: The Link Between Air Pollution and Climate Change

	10:00-11:00	Welcome address and introduction
Session 1	11:00-12:00	Energy Fix –The Role of Low-Emission Technologies in Addressing Air Pollution & Climate Change
Session 2	12:15-13:00	Solutions for Pollution (poster presentation by students)
Session 3	14:00-15:00	Seeing Is Believing – Addressing the Time Lag of Climate Change Impact to Enable Policies That Work
Session 4	15:15-16:15	The Number Game – Putting a Number on Our Losses
Session 5	16:15-17:15	Introducing Sponsors
	17:15-17:30	Summary of the day and conclusion

DAY 3: 25 August 2022

Tracking Clean Air Policies: Where Are We in the War Against Pollution?

	10:00-10:30	Welcome note and keynote address
Session 1	10:30-11:45	Policy Manoeuvres–Way forward for NCAP
Session 2	12:00-13:00	Student poster competition (Final round)
Session 3	14:00-15:10	Better Data for Better Policies – Standardising Measurement Practices
Session 4	15:25-16:30	Policy Integration – Leveraging Co-benefits of Policies Addressing Air Pollution and Climate
Session 5	16:30-17:15	Introducing Sponsors
	17:15-17:30	Summary of the day and conclusion

DAY 4: 26 August 2022

Air Sensor International Conference – India Chapter

Opening panel	09:50–10:45	Where We Are and Where We're Going with Small Low-Cost Air Quality Sensors
Session 1A	11:15–12:15 (Parallel)	Data Modelling and Analytics
Session 1B		Choosing and Evaluating a Sensor
Session 2A	12:15–13:15 (Parallel)	Data Assimilation, Sharing, and Visualisation
Session 2B		Network Design and Operations
Session 3	14:05–14:50	Performance Targets and Sensor Calibration
	14:50–15:50	Lightning Talks
Session 4	15:50–16:50	Real-World Sensor Applications: Illustrating Practical applications of Low Cost Sensors
Closing panel	16:50–17:50	How to Use Sensor Data to Drive Action

DAY 1: 23rd August

18:30 – 20:10 | Inauguration

The Right to Life: Citizens at the Centre of Science and Policy



Smt T Sumathy (a) Thamizhachi Thangapandian
Poet and MP, Lok Sabha, Tamil Nadu



Shri K Sudhakar
Minister of Health and Family Welfare and Medical Education, Government of Karnataka



Mr Ricky Kej
Grammy-winning Music Composer & Environmentalist



Mr Vikram Gulati
Country Head & Sr VP (Corporate Affairs & Governance), Toyota Kirloskar Motor



Dr Jai Asundi
Executive Director, CSTEP



Dr Pratima Singh
Research Scientist, CSTEP



Ms Sandra Hall
Conference and Outreach Manager, UC Davis

DAY 2: 24th August

10:00 – 11:00 | Opening Session

Two Sides of the Same Coin: The Link Between Air Pollution and Climate Change

Opening Address:



Dr Jai Asundi
Executive Director, CSTEP



Dr Pratima Singh
Research Scientist and Lead, Centre for Air Pollution Studies, CSTEP



Guest Address:



Dr Shanth A Thimmaiah
Chairman, Karnataka State Pollution Control Board (KSPCB)



Shri Jawaid Akhtar (IAS)
Additional Chief Secretary, Forest, Ecology and Environment, Government of Karnataka



Shri Vijay Mohan Raj (IFS)
Principal Secretary, Forest, Ecology and Environment, Government of Karnataka

Panel Discussion

11:00 – 11:45

Energy Fix – The Role of Low Emission Technologies in Addressing Air Pollution & Climate Change

What are the sustainable approaches for adopting clean fuel technology for a holistic reduction in emissions in developing countries?

Session Chair:



Ms Vinuta Gopal
Founder & CEO, ASAR

Panelists:



Mr Ajai Sirohi
Chief Development Officer,
Toray Industries India Pvt Ltd



Ms Ulka Kelkar
Director – Climate, WRI India



Dr K V George
Sr Principal Scientist & Head,
Air Pollution Control Division,
CSIR-NEERI



Dr Parth Sarathi Mahapatra
Technical Advisor, GIZ

Solutions for Pollution (student poster presentation)

12:15 – 13:00

Evaluation of students' posters and shortlisting five finalists

Judges:



Dr Pratima Singh
Research Scientist and Lead,
Centre for Air Pollution Studies, CSTEP



Dr Sreekanth Vakacherla
Sr Research Scientist, CSTEP



Dr Vijay Kanawade
Assistant Professor,
University of Hyderabad

Research Insights

14:00 – 15:00

Seeing Is Believing – Addressing the Time Lag of Climate Change Impact to Enable Policies That Work

Assessing the effects of air pollution on regional climate, livelihood, and survival

Session Chair:



Ms Gunjan Jain
Lead, Communications
for Air Quality and Climate
Impacts, Climate Trends

Panelists:



Mr Chandra Bhushan
CEO, iFOREST



Dr Stijn Janssen
Program Manager, VITO



Dr Vijay Kanawade
Assistant Professor,
University of Hyderabad



Mr Polash Mukerjee
Lead, Air Quality and Climate
Resilience, NRDC India Programme



Panel Discussion

15:15 – 16:15

The Number Game – Putting a Number on Our Losses

Exploring the economic impact of air pollution on the society, environment, and occupational health

Session Chair:

Panelists:



Prof Ravindra Khaiwal
Professor, Department of
Community Medicine & School
of Public Health, PGIMER



Dr Ramachandran Thiruvengadam
Assistant Professor, Department of Biochemistry,
Pondicherry Institute of Medical Sciences



Dr Basha Khan
Director-Lung Transplant,
Narayana Healthcare, Bengaluru



Dr Harshal Salve
Additional Professor, AIIMS



Dr Rahul Patil
Cardiologist, Sri Jayadeva Institute of
Cardiovascular Sciences and Research



Introducing our sponsors
Concluding Remarks

16:15 – 17:15
17:15 – 17:30

DAY 3: 25th August

10:00 – 10:30

Tracing our Steps for Cleaner Air Policies

Keynote address



Shri Srinivasulu, IFS
Member Secretary, KSPCB



Shri Tushar Giri Nath (IAS)
Chief Commissioner, BBMP



Ms Devaja Shah
Program Manager, Google

Panel Discussion

10:30 – 11:45

Policy Manoeuvres – Way forward for NCAP

Understanding ground-level challenges faced by NCAP, identifying interventions required for achieving NCAP targets, and highlighting the way forward

Session Chair:

Panelists:



Dr Shirish Sinha
Director, Climate, CIFF, India



Prof Sachchida Nand Tripathi
Sr Professor, Department of Civil Engineering,
IIT Kanpur



Mr Jostein Nygard
Sr Environmental Specialist,
World Bank



Ms Puja Tewary
Environment Program,
Bloomberg Philanthropies



Shri Ashish Tiwari (IFS)
Secretary, Department of Environment,
Forest & Climate Change,
Government of Uttar Pradesh



Mr Soumitri Das
Project Management Specialist (Environment)
and Team Lead (Pollution and Health Impacts), USAID

Session 2: Student poster competition (Final round)

12:00 – 13:00

Judges:



Dr Pratima Singh
Research Scientist and Lead,
Centre for Air Pollution Studies, CSTEP



Dr Sreekanth Vakacherla
Sr Research Scientist, CSTEP



Dr Vijay Kanawade
Assistant Professor,
University of Hyderabad

Deep Dive

14:00 – 15:10

Better Data for Better Policies – Standardising Measurement Practices

Framing a uniform measurement protocol using hybrid sensors, satellite data, mobile monitoring, etc., for informed policy decisions

Session Chair:



Dr Pratima Singh
Research Scientist and Lead,
Centre for Air Pollution Studies, CSTEP

Speakers:



Prof Sagnik Dey
Institute Chair Professor,
Centre for Atmospheric Sciences, IIT Delhi



Prof Neeraj Rastogi
Professor,
Physical Research Laboratory (PRL)



Dr Ashok Ghosh
Chairman, BSPCB



Shri Ashish Tiwari (IFS)
Secretary, Department of Environment,
Forest & Climate Change,
Government of Uttar Pradesh



Ms Akshara Kaginalkar
Senior Director (Sc G) at Centre for
Development of Advanced Computing (C-DAC)

Panel Discussion

15:25 – 16:30

Policy Integration – Leveraging Co-benefits of Policies Addressing Air Pollution and Climate

Discussing counter-intuitive policy decisions on climate and air pollution, identifying the correlation between air pollution and climate change policies, and determining sustainable approaches

Session Chair:

Panelists:



Ms Divya Narayanan
Campaigns Director, Jhatkaa



Dr O P Agarwal
CEO, WRI India



Ms Prarthana Borah
Director-India, CDP



Dr Bhargav Krishna
Fellow, CPR



Ms Anumita Roy Chowdhury
Executive Director, CSE

Session 5: Introducing our sponsors

Sponsors speak (continued from Day 2)

16:30 – 17:15

Concluding remarks

17:15 – 17:30

Speaker:



Dr Pratima Singh
Research Scientist and Lead,
Centre for Air Pollution Studies, CSTEP



AIR SENSORS INTERNATIONAL CONFERENCE

International Connection Hub

DAY 4: 26 August 2022

09:50 – 10:45

AIR SENSORS INTERNATIONAL CONFERENCE

Where we are and where we're going with small low-cost air quality sensors

Moderated by:

Panelists:



Dr Pratima Singh

Research Scientist and Lead,
Centre for Air Pollution Studies, CSTEP



Dr Zoe Chafe

Technical Lead, Air Quality,
C40 Cities



Mr Vasu Kilaru

Scientist, US EPA



Mrs Bhavreen Kandhari

Co-Founder, Warrior Moms



DAY 4: 26 August 2022

11:15 – 12:15

Session 1A: Data Modeling & Analytics

Where we are and where we're going with small low-cost air quality sensors

Moderated by:

Panelists:



Dr Saumya Singh

Environmental Scientist,
UC Berkeley



Dr Priyanka deSouza

Assistant Professor,
University of Colorado, Denver



Mr Sean Khan

Program Manager, UNEP



Mr Zeel Patel

Researcher,
IIT Gandhinagar

Session 1B: Choosing & Evaluating a Sensor

Moderated by:



Mr Karthik Ganesan
Fellow and Director - Research
Coordination, CEEW

Panelists:



Dr Sreekanth Vakacherla
Senior Research Scientist, CSTEP



Ms Meenakshi Kushwaha
Co-founder, ILK Labs



Mr Vasudev Malyan
Researcher, IIT, Bombay



Session 2A: Data Assimilation, Sharing, & Visualization

12:15 – 13:15

Moderated by:



Ms Tanushree Ganguly
Program Lead, CEEW

Panelists:



Mr Vasu Kilaru
Scientist, US EPA



Mr Ayyan Karmakar
Co-Chief Marketing Officer, Oizom



Ms Swagata Dey
Technical Advisor & Researcher,
Environmental Defense Fund



Session 2B: Network Design & Operations

Moderated by:

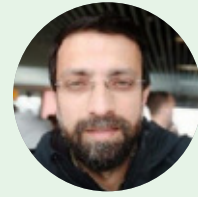


Ms Devaja Shah
Program Manager, Google

Panelists:



Prof Sachchida Nand Tripathi
Sr Professor, Department of Civil Engineering,
IIT Kanpur



Mr Ronak Sutaria
Founder & CEO,
Respirer Living Sciences Pvt. Ltd.



Dr Saumya Singh
UC Berkeley



Session 3: Performance Targets & Sensor Calibration

14:05 – 14:50

Moderated by:



Ms Namita Gupta
Founder, Airveda

Panelists:



Dr R Subramanian
Senior Scientist, QEERI



Mr Adeel Khan
Research Analyst,
Council on Energy Environment and
Water (CEEW)



Lightning Talks

14:50 – 15:20

Speakers:

Dr. Afifa Aslam

Department of Environmental Sciences,
University of Jhang, Pakistan

Mr Sairam Dhandapani

Council on Energy,
Environment and Water

Dr Suverna Trivedi

University of California Berkeley,
NIT Rourkela India

Mr Mohsinkhan Pathan

SVNIT, Surat

Mrs Akanksha Priyadarshini

Phoenix Robotix Pvt. Ltd.

Mr Karm Patel

IISc Bangalore

Poster Review & Lightning Talk Discussion Break

15:20 – 15:50

15:50 – 16:50

Session 4: Real-World Sensor Applications: Illustrating Practical Applications of Low Cost Sensors

Moderated by:



Dr Pratima Singh

Research Scientist and Lead,
Centre for Air Pollution Studies, CSTEP

Panelists:



Dr Naveen Puttaswamy

SRU, Chennai



Dr Damodar Bachani

Deputy Project Director, John Snow
India Private Limited, New Delhi



Ms Everlyn Gayle Tamayo

Air Quality Specialist, Clean Air Asia



Closing Panel: How to Use Sensor Data to Drive Action

16:50 – 17:50

Moderated by:

Panelists:



Dr Vignesh Prabhu
Senior Associate, CSTEP



Mr Avijit Michael
Executive Director, Jhatkaa



Mr Chetan Bhattacharji
Senior Managing Editor, NDTV.



Dr Sarita Ahlawat
Head of Living Science Group, IIT Delhi



Ms Farah Kazi
Strategic and Technical Communications
Consultant, Respirer Living Sciences





STUDENT
Posters



Title: Assessment of Ambient Air Pollutants, and Climatic Variables on Vegetative Indices Over The Last Decade in the Six Major Cities of Uttarakhand

Researcher

Hema Bhatt, *Central University of Rajasthan, Ajmer*

Title: Exploring Linkages Between Land Use Change, Peri-Urban Air Pollution and Environmental Policy- A Remote Sensing Enabled Data Analytics Driven Approach

Researcher

Ravi Bhushan, *BITS Pilani, Hyderabad*

Title: Machine Learning Based Calibration of PM2.5 Using Low-Cost Sensors via Incorporation 2 of Environmental Parameter

Researchers

Rajat Hedao & Gaurav Sarode, *CSIR-National Environmental Engineering Research Institute (CSIR-NEERI)*

Title: Demographic and Socio-Economic Disparities in PM2.5 Exposure in India: A Regional/State Level Analysis

Researcher

Debajit Sarkar, *Indian Institute of Technology Delhi, India*

Title: Evolution of Urban Vehicular Emissions Reduction Policies in India

Researcher

Neha Bhadauria, *Amity University, Noida*

Title: Health Benefits of Meeting Clean Air Targets in India: A Cross Sectional Study

Researcher

Ekta Chaudhary, *Centre for Atmospheric Sciences, Indian Institute of Technology, Delhi*

Title: Investigation of On-Road Size-Segregated Particulate Matter Exposure Concentration and Age-Specific Lobar Deposition in Human Airway

Researchers

Sneha M & Ramsundram N, *Department of Civil Engineering, Kumaraguru College of Technology*

Title: Simulating Impact of Traffic Air-Pollution Using Agent Based Modeling**Researcher**

Vagmi Patel, *CEPT University*

Title: Application of A High-Resolution Emission Inventory Management System to Assess Linkages in Air Pollution and Climate Change over India**Researchers**

Ganesh Gupta & Kushal Tibrewal, *Indian Institute of Technology, Bombay*

Title: Aerosol Simulations of General Circulation Models of CMIP6 for Air Pollution Studies in a Changing Climate**Researcher**

Bharath J, *SRM Institute of Science and Technology, Kattankulathur*

Title: Connection of Black Carbon Air Pollution to The Rainfall over Chennai**Researcher**

Arunima V. S, *SRM Institute of Science and Technology, Kattankulathur*

Title: Nexus of Air Pollution, Public Health, and SDGs for Indian Metropolitan Cities**Researcher**

Priti K, *Academy of Scientific & Innovative Research (AcSIR)*

Title: Use of Low-Cost Sensor Network for Predicting Micro-Satellite Imagery Based PM2.5 via Machine Learning Models**Researcher**

Vaishali Jain, *IIT Kanpur*

Title: Paddy Residue Burning: Linking Air Quality from Field to Space over Punjab & Haryana for Robust Mitigation Strategies**Researchers**

Sanjeev Bhardwaj & Sahil Kumar, *Department of Environment Studies, Panjab University*

Title: Future of Clean Air in Perspective for Achieving Sustainable Development Goals**Researchers**

Akshi Goyal & Nitasha Vig, *Department of Environment Studies, Panjab University*



CAPS Studies



Emission Inventory and Pollution Reduction Strategies for Bengaluru

CSTEP developed an emission inventory (EI) for the air-shed area (an area of 60km × 60km) of Bengaluru. Emission load for various polluting sectors was estimated based on the Central Pollution Control Board (CPCB) and United States Environmental Protection Agency (USEPA) methodology. The EI study estimated particulate matter (PM10 and PM2.5), oxides of nitrogen (NOx), and sulphur dioxide (SO2) emissions for 2019.



Identification of Polluting Sources for Bengaluru – Source Apportionment Study

CSTEP, under the aegis of KSPCB, conducted a source apportionment of particulate matter concentrations for Bengaluru. The study had three major components: (i) Sampling of PM2.5 and PM10 through fine particulate sampler and respirable dust sampler, respectively. The study quantified the sources of PM2.5 and PM10 at the 13 sites monitored by KSPCB in Bengaluru. (ii) Quantification of the chemical species through various analytical instruments. (iii) Source apportionment of PM2.5 and PM10 through receptor modelling using the chemical mass balance model. The quantified chemical data was then used as an input for running the receptor model to derive the sector-wise contribution to pollution.



Satellite-Based Mapping and the Quantification of PM2.5 in India

Daily mean PM2.5 was estimated and spatial maps (1-km spatial resolution) were generated using Moderate Resolution Imaging Spectroradiometer (MODIS) AOD for 2019 across select Indian regions. The study regions included the urban, periurban, and rural regions of Delhi-National Capital Region (NCR), Kanpur, and Bengaluru. An advanced statistical model was trained using open-access data sets (satellite, regulatory ground-based PM2.5, reanalysis meteorology) to estimate the daily mean PM2.5. Annual and seasonal maps of PM2.5 were generated, and a hotspot analysis was performed to identify spatial clusters of high PM2.5 grids within the study regions. Spatial gradients in PM2.5 were studied to understand the rural, peri-urban, and urban contrast in pollution levels.



Best Practices for Deploying and Maintaining a Low-Cost PM2.5 Sensor Network

The affordability, portability, and availability of LCSs make air quality data accessible to the general public. The best practices suggested in this study are expected to help stakeholders set up and maintain LCS networks efficiently. The points put forth are based on our experience in establishing a city-wide PurpleAir LCS network in Bengaluru and maintaining it for 2 years.



Mobile-Monitoring Campaign for Air-Pollution Studies in Bengaluru

This report summarises the outputs of an 11-month-long mobile-monitoring project with a goal to produce a high-resolution pollution map of select parts of Bengaluru. The study investigated the feasibility of mobile-monitoring studies in middle-income



countries, which often have poor road conditions (making such measurement campaigns challenging), high background pollution levels, and heterogeneous sources of pollution.

Comprehensive Clean Air Action Plan for the City of Patna

The Patna Clean Air Action Plan was prepared to identify source-specific control measures (CMs), and a techno-economic assessment (TEA) on the CMs was performed. An emission inventory was also developed.

The study estimated that the emission level will increase by 42% in 2030 without any interventions. The study estimated that under high-, medium-, and low emission-reduction scenarios, the PM2.5 emission level can be reduced by 69%, 48%, and 30% respectively with reference to the BAU scenario.



Comprehensive Clean Air Action Plan for Gaya

The Gaya Clean Air Action Plan was prepared to identify source-specific control measures (CMs), and a techno-economic assessment (TEA) on the CMs was performed. An emission inventory was developed to estimate the total emission load from various polluting sources of the city. The study estimated that the total PM2.5 emission load for 2018 is around 10,000 tonnes/year and is estimated to reach around 16,000 tonnes/year in 2030, under the business-as-usual (BAU) scenario. Emissions from the transportation sector were found to be the highest.



Comprehensive Clean Air Action Plan for Muzaffarpur

A clean air action plan was prepared, under which an emission inventory was developed for Muzaffarpur. The Muzaffarpur Clean Air Action Plan (MCAAP) identified source-specific Control Measures (CMs) and performed a Techno-Economic Assessment (TEA) of the CMs. The study estimated that under high-, medium-, and low emission-reduction scenarios, the PM2.5 emission level can be reduced by 37%, 28%, and 19% respectively, with reference to the BAU scenario for 2030. Under the high emission-reduction scenario, the city would save at least 800 lives by 2030.





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How Google is Mapping for Sustainability in collaboration with local partners

Sustainability is at the core of everything we do at Google. Be it running operations on carbon free energy or helping consumers make informed choices about their purchases, we believe in applying technology to help solve environmental challenges at scale. Over the last few years we've come up with tools like Environmental Insights Explorer, that make transport emissions and Air Quality data (street level) available to city authorities for better decision making. Cities across the world have used the data to develop climate action plans and propose urban policy changes to reduce air pollution.

In India, we've supported local partners like Aurassure and CSTEP to build Air Quality maps from the ground, helping them set up low cost sensor networks in Bangalore and Bhubaneswar and providing the technology to store, process and build Air Quality prediction models. Ultimately, our goal is to be able to support policymakers in data-driven decision making, so we can collectively work towards a sustainable, healthy future. To learn more about Google's for good efforts, visit g.co/earth/outreach. For collaborations, email geoforgood-india@google.com



Oizom® is an environmental IoT company offering data-driven environmental solutions for better decision-making. With sensor-based hardware, Oizom’s monitors various environmental parameters like air quality, noise, odour, radiation, weather conditions, etc. The data analytics platform derives many actionable insights for authorities, communities, and industries. At present, Oizom’s monitors are present across 50 countries monitoring the air quality that affects 23 million people. Oizom® strives to play an essential role in a sustainable future through smart environmental solutions and data science.



Aeron is a Pune-based fast-growing MSME registered tech company developing innovative solutions for Indian Defence and global customers. Aeron offers a wide range of technology-driven products and solutions in the Inertial Sensing and IIoT verticals. Aeron has a proven track record of supplying instruments for air pollution monitoring, water quality monitoring, and weather monitoring applications. Aeron also has proven MIL standards for defence line products. Aeron’s Environmental Sensors offer everything that today’s tough environmental challenges demand: versatility, ruggedness, precision, and reliability over time.



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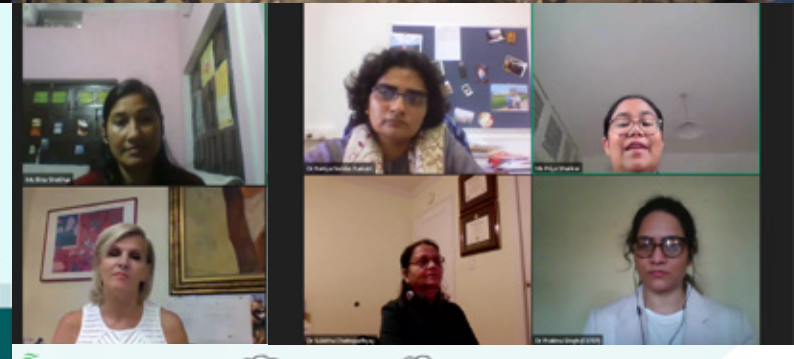
INDIA CLEAN AIR SUMMIT, 2019



INDIA CLEAN AIR SUMMIT 2020
Theme: Finding the Missing Evidence
August 25 - 26, 2020
3:00 - 6:00pm

How do we build evidence to inform policy decisions on air pollution?
Here's a hint: Data is the link.

Day 1 | Data: The Missing Link between Pollution and Targeted Policy Action
Day 2 | Beyond Monitoring & Measurement: Interpreting Data



Supported by: MacArthur Foundation, Bloomberg Philanthropies, SHAKTI, CAPS, STEP, ICAS.

“KSPCB has come up with 442 action plan to reduce Bengaluru's Air Pollution & has identified nodal agencies for the same.”
— Dr. Anand, President, Karnataka State Pollution Control Board (KSPCB)

“Over half of the countries do not produce any monitoring data at all, India is slightly better off, but given the size of the country, we need more.”
— Mr. Pratik Shinde, India Director, Environmental Programs, Bloomberg Philanthropies

“High resolution data can help evaluate effectiveness of policies & target pollution sources.”
— Prof. S.K. Tripathi, Professor, Department of Chemical Engineering, IIT Bombay

“Air pollution is a global problem where we need all entities to work together to solve the problem.”
— Dr. Anand, President, Karnataka State Pollution Control Board (KSPCB)

“Mobile monitoring of Air Pollution is less expensive than reference-grade instruments but can give detailed information on the spatial and temporal of pollution across the city.”
— Dr. Anand, Professor, Department of Chemical Engineering, IIT Bombay

“COVID-19 had an important lesson for Air Pollution scientists, to bring about any meaningful change in society, we need to bridge the gap between scientists & the larger society.”
— Dr. Pratik Shinde, India Director, Environmental Programs, Bloomberg Philanthropies

INDIA CLEAN AIR SUMMIT 2020
AUGUST 25-26, 2020
DAY 1

Supported by: CAPS, STEP, ICAS.

“We are planning to install monitoring stations across Bihar to predict what is happening across the state. Scientific information is necessary to inform policies.”
— Dr. Anand Ghosh, Chairman, Bihar State Pollution Control Board (BSPCB)

“Every year 7 million premature deaths due to exposure to Air Pollution. This number is relevant and shocking despite the fact that we have heard it so many times.”
— Dr. Maria Neira, Director, Department of Environment, Climate Change and Health, World Health Organization (WHO)

“The public is aware of why we need scientific studies to build data and understand that this is towards improving the quality of life.”
— Dr. Sunil Sharma, Member, Joint Science and Climate Change Division, The Energy and Resources Institute (TERI)

“Challenges of governing the air - especially given the realities of Indian state is huge. And that is why our actions and policies should not be short-lived, they need to focus on future and need to be sustainable.”
— Dr. Pratik Singh, Research Scientist, CAPS

“If we monitor more, it is very likely that we will have more than 732 non-attainment cities.”
— Shri Anand Taneja, Member (Secretary, Air Pollution Control Board (APCB))

“The potential for change lies not only in air quality data but also in making this data accessible.”
— Mr. Eric Sarker, Lead Campaigner, Climate Agenda

INDIA CLEAN AIR SUMMIT 2020
AUGUST 25-26, 2020
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most polluted cities are in India. (World Air Quality report, IQ Air 2020)

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स्वच्छ हवा नागरिकों का मौलिक अधिकार, हर हाल में कम करना होगा प्रदूषण : सुरेश प्रभु

नई दिल्ली/पटना/राजधानी। स्वच्छ हवा और स्वच्छ वायु का अधिकार है। लेकिन स्वच्छ हवा के अधिकार को लागू करने में बाधा है। हमें वायु की गुणवत्ता को सुधारा देने पर ध्यान देना होगा। वायु प्रदूषण को कम करने के लिए हमें वायु प्रदूषण को कम करना होगा।

इस अवसर पर विज्ञान, प्रौद्योगिकी और नीति अकादमी के अध्यक्ष सुरेश प्रभु (सीएसटीआई) के कार्यकारी निदेशक डॉ. जय अमृती ने कहा कि हमारा ध्यान वायु प्रदूषण के कारण स्वास्थ्य पर पड़ने वाले प्रभावों को दूर करना है।

हमारे पास है। हमें वायु प्रदूषण को कम करना होगा। हमें वायु प्रदूषण को कम करना होगा। हमें वायु प्रदूषण को कम करना होगा।

स्वच्छ हवा नागरिकों का मौलिक अधिकार हर हाल में कम करना होगा प्रदूषण: प्रभु

हमें वायु की स्वच्छ गुणवत्ता को मूल कारणों पर ध्यान देना होगा।

नई दिल्ली, 27 अगस्त (समाचार समाज) - स्वच्छ हवा और स्वच्छ वायु का अधिकार है, लेकिन स्वच्छ हवा के अधिकार को लागू करने में बाधा है। हमें वायु की गुणवत्ता को सुधारा देने पर ध्यान देना होगा। वायु प्रदूषण को कम करने के लिए हमें वायु प्रदूषण को कम करना होगा।



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MEET THE
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