



IIT DELHI



CENTRE OF EXCELLENCE FOR RESEARCH ON CLEAN AIR
INDIAN INSTITUTE OF TECHNOLOGY, DELHI
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Air Quality Workshop
“The Path to Clean Air – Reducing Fine PM Concentrations”
25th June 2019, IIT Delhi
Workshop Report

Centre of Excellence for Research on Clean Air (CERCA), IIT Delhi in association with the Embassy of the United States of America, New Delhi has organized a Workshop on Air Quality “The Path to Clean Air – Reducing Fine Particulate Matter (PM) Concentrations” at IIT Delhi on 25th June’2019.



From Left to Right: Ms. Isabella Detwiler, Mr. Ritesh bhatia, Mr. Hemant Kaushal, Prof. Sagnik Dey, Prof. James Schauer, Shri Arun Duggal, Dr. M P George, Mr. Christopher Commins, Prof. Mayank Kumar

The Workshop aims to bring various stakeholders from the Government, Academia, Research institutions, NGOs and Industry to deliberate on the current status of air pollution in Delhi/NCR, their sources and the measures required to combat air pollution. A unique feature of the workshop was sharing of the US Success story in tackling air pollution by **US Science Envoy Dr. James Schauer**, Professor of civil and environmental engineering at the University of Wisconsin-Madison who has extensive experience in source apportionment and whose work focuses on developing a quantitative understanding of the origin of air pollution. The workshop covered a range of topics such as National Clean Air Action Plan and the role of MoEFCC and CPCB, State/local Air Pollution Control Measures, Best Practices in Regulatory and Enforcement coordination, Point-sources of Air Pollution & monitoring, Clean Air technology innovations, Vehicles—their role and best cleaner-vehicle policies. EV policy and the future—buses, long distance trucking, last mile connectivity & Agricultural Burning—causes, enforcement mechanisms, alternatives, areas for collaboration etc. The workshop was concluded with a roundtable discussion on the identification of gaps and emerging opportunities.

We were fortunate to have a wide range of speakers from all arenas – research institutions, Government ministry, and Govt. agencies. We thank all speakers for sparing their time and effort they took to share their thoughts and experiences with audiences in the workshop. Their expertise in the area of air Pollution was critical to the success of this event. Most of the credit goes to all speakers who gave such interesting presentations on this extremely sensitive issue. We would also like to acknowledge the important contributions of all of our workshop participants and in particular those who use our services for sharing with us their personal insights and aspirations.

The workshop inaugural session began with an introduction by Shri Arun Duggal, followed by welcome address by Prof. B.R Mehta, Dean R&D. After that Prof. Sagnik Dey welcomes Prof. James Schauer and introduced him to all delegates. Next, Prof. Schauer gave his keynote on “The Path to Clean Air” through an interactive presentation. His key message on pathways to clean air was mainly focused on the requirement of broad stakeholder engagement, data and analysis transparency, accountability and provisions for refinement and flexibility. He also talked about strategies to address climate change, energy access, energy security, and air quality which are linked but are not synonymous. He explained how programs and policies that lead to clean air can lead to innovation and are compatible with economic development. In the session’s end, Mr. Hemant Kaushal proposed a warm vote of thanks and presented plant memento to all speakers

To this inaugural end, we have placed the next session in the hands of Prof. Schauer who moderate the important session “Source Apportionment Studies: A U.S Story”. The aim of this session was to explore US experience in source apportionment and particularly for the Delhi case. For this session, Mr. Anthony Facchiano, senior program manager EPRI, joined our workshop through a video session from the US and gave a presentation on “Control of emissions from Power plants. He talked about his organization and its role in the energy and environment sector. He explained about the technologies to control PM concentration like ESPs, fabric filters, Combustion NOx Controls Technologies, SCR Technology. Next to speak was, Prof. Schauer, who presented Delhi source apportionment assessment in which he talked about major sources and emission inventories, the chemical composition of PM and characterization of PM 2.5 in Delhi. He said that the source apportionment studies conducted in Delhi should be synthesized to make a more comprehensive. He focused on a need to develop a weight of evidence approach for sources apportionment that can be provided to policy makers.

Next talk was given by Dr. Sudheer Chintalapati, Joint director MoEFCC, He discussed National Clean air programme (NCAP) and the role of MoEFCC and CPCB in pollution reduction planning and strategy. He started his presentation with the action taken in Delhi NCR to curb air pollution. He discussed action taken at the policy level, transportation, and industrial sector, and he also discussed various steps taken in control of biomass and solid waste and dust emissions. He informed about the reduction in average annual PM2.5 by about 7% and 15% in 2018 over 2017 and 2016 respectively in Delhi due to the implementation of this programme. On 10 January 2019, a time bound national level strategy for pan India implementation to tackle the increasing air pollution problem across the country in a comprehensive manner in the form of National Clean Air Programme (NCAP) was launched by MoEFCC for 102 nonattainment cities. “Collaborative and participatory approach involving relevant Central Ministries, State Governments, local bodies and other Stakeholders with focus on all sources of pollution forms the crux of the Programme with National level target of 20-30% reduction of PM2.5 and PM10 concentration by 2024. He also discussed the different components of NCAP and its framework.

Next to speak was Dr. M P George from DPCC, focused on Local/City air pollution control efforts implemented in Delhi. He started his presentation with the development of Monitoring Network of DPCC. He then discussed the reasons for air pollution and critical Pollutants for the Delhi determined by different Source Apportionment Studies than responsible action taken by DPCC to curb them. He said that as a New Initiatives Green Budget has been passed by Delhi Government for providing a subsidy to the following work: Conversion of industries to PNG, Augmentation of Solid Waste processing facilities by MCDs, etc.

The Final speaker of this session was Bharti Singla, Chakr, presented how technological innovation like Chakr has been helping in air pollution reduction from Diesel Generator. She started the presentation by Black carbon and its harmful environmental consequences. She then discussed different innovations to reduce black carbon along with

Chakr model and its characteristic features, which made its most effective amongst other pollution reduction innovations. Implementation of Chakr model could result in up to 15% reduction in overall Ambient PM levels.

Following the comprehensive inputs by speakers, the session moderator invited all delegates and speakers for Roundtable discussion on effective implementation of air quality action plans and consider key questions relating to the overall session. Prof. Sagnik Dey gives his suggestion on speciation of PM_{2.5} than using of PM_{2.5} reduction strategies. Dr. Vivek has asked some clarification on the reduction of poor air quality days. Dr. Rajeev Khurana from Lung Care Foundation has asked MoEFCC officials to work under emergency model because air pollution is a serious concern to human health and environment and NACP targets of 20-25 % PM reduction would not be sufficient to tackle it. Mr. Farhaan from Kriteria also raised similar concerned about the emergency situation and added that the organization should be given incentivization on reporting of air quality data. On the question of 20-25 % PM reduction, Dr. Sudheer Chintalapati said other countries like Mexico had achieved 20 % PM reduction in 25 years, on keeping this mind government has set a practically achievable target of 20-25 % PM reduction. On the question of whether India would able to reach the WHO standard of PM_{2.5}, Dr. M P George said that geographically India is situated in dust storm region and historically as Babar had written that he does not want to come to India because which is full of dust. Therefore, it is not sure, however, we are not sure that how much percentage of these dust is carcinogenic to health. Ms. Nita Kapoor raised concerned about public awareness and citizen engagement to curb air pollution problems. Mr. Arun Duggal also raised similarly concerned and focused on citizen involvement in pollution reduction programme.

After Lunch, Prof. Mayank Kumar was invited to moderate our next session on air pollution sources. This session explored new ways of monitoring air pollution and integrated approach to ameliorate the clean air situation in Delhi. First Presentation of this session was given by Prof. Mayank Kumar, IITD, discussed on Near-Continuous PM_{2.5} chemical speciation and source apportionment study conducted by his team. They have installed continuous PM_{2.5} monitoring stations at three locations in Delhi NCR. PM data from these stations would be used to understand impacts, e.g. health, evaluate policy, climate change.

The second presentation of this session was presented by Dr. Dan Greenbaum, President Health Effects Institute, who has joined our workshop through a video session from the US and gave a presentation on challenges faced by US in implementing Clean Air Policies and possible learning and recommendations for India. He started with a history of air pollution in USA and government steps to control this. USA government continuous efforts on air pollution had finally reduced the emissions by around 67% compared to 1980. Based on the USA experience Indian government can work on substantial investment in science, the establishment of High Quality Science Advisory Committees to review, applying consistent Source apportionment, training across all states and cities on the best approaches, and Continue efforts, through monitoring.

Next Technical talk was given by Dr. James Schauer, U.S Science Envoy, presented on mobile source emissions including Greenhouse Gas Emissions and Air Pollution. He further discussed the available advanced technologies to reduce vehicle air pollution like catalytic converter, Diesel Particulate Filters (DPF) and Diesel Oxidation Catalysts (DOC) and Diesel Engine SCR (Urea Injection). He also discussed the chronological development of more stringent vehicular air pollution standards in USA.

Next to speak was Mr. Ritesh Bhatia from IPS Foundation, presented on Agricultural Burning—causes, enforcement mechanisms, alternatives, areas for collaboration. He first discussed the origin of paddy stubble problem in Punjab and discussed the possible solution of the problem. He found that in field management is economical and can be implemented immediately. He then presented a case study where wheat sowing and germination were compared between with Happy Seeder and on a burnt field, and both plots have the same wheat yield. It clearly showed that in situ management of crop is the most cost efficient and immediately applied solution to a burning problem. However, it required awareness, adoption, and behavior change among farmers.

After that Mr. Satyendra Kumar gave a talk on implementing solutions for abatement of air pollution with the help of integrated approach and innovations. He stressed upon the management of air pollution with the help of high level task force and comprehensive action plan and graded response action plan. He talked about the stepwise approach

and Development of an integrated monitoring mechanism for each of the cities using artificial intelligence and data analysis. He also added on further new interventions possible which includes improving walkability in cities, intelligent traffic management systems, use of technology and involvement of technical institutions in planning and monitoring and Micro Level Action Plans for Hotspots.

The Final talk of this session was given by Prof. Sagnik Dey, Coordinator CERCA. He talked about the monitoring of air pollution using satellite data. He said satellite data has huge potential in air quality and management in India. It can work as a guidance for expansion of the ground-based network. He informed about MAIA Satellite Mission of NASA in 2020 which will enable us to measure speciated PM_{2.5} at 1 km by 1 km resolution under which Delhi is also a primary target area.

Following the conclusion of this session, the session moderator invited the delegates for their questions, thoughts and comments and many people were willing to provide feedback on the presentations and offer their views.

Concluding Session

In the end, Prof. James Schauer concludes the workshop with round table discussion and some critical final comments on the identification of gaps and emerging opportunities. He emphasized the requirement of speciation data and monitoring network in India. He talked about community engagement and the role of social science in solving air pollution problem. He said scientific investment needs to be enhanced significantly. He further added that the use of innovative approach can drive things forward for example usage of satellite data, big data and machine learning can make a big difference in air pollution management. He also said E-vehicles is not the only solution to air pollution, but we also need advanced technological controls on mobile (e.g. vehicles) and point (e.g. power plants, brick-kilns). He mentioned about toxic metals in road dust which is an emerging research area to be a focus upon because of human exposure. He also stressed upon the source apportionment of similar cities (nonattainment cities) in different time scale and said that the scientific community needs to work together to communicate source apportionment results to policy makers.

Following the conclusion, Mr. Arun Duggal proposed a vote of thanks to speakers, audiences and organizers and wrapped up the workshop.