

### **Delhi's Air Pollution Touching Extremes**

On 13<sup>th</sup> November 2019 forecasters warned that air pollution is likely to reach to “severe” or “emergency” levels with choking smoke and dust ready to descend upon the 20 million residents of Delhi. Air quality index monitors maxed out with ratings of 999 and pollution reached 50 times the level considered safe by the World Health Organization. The severity of the gray haze resulted in cancellation of hundreds of national and international flights; schools got closed, and resulted in a public health emergency. Government of Delhi immediately distributed 5 million face masks to schoolchildren as a primary major to protect them from health hazards of the choking air pollution.



Gray haze engulfed the Delhi's atmosphere

According to multiple reports published last week, the rapidly increasing pollution in Indian megacity Delhi is touching the new extremes which may have significantly adverse impact on the economy and public health. The atmospheric air is majorly polluted from a mix of weather conditions, urban emissions, and rural smoke. It has dangerously covered India's capital Delhi and adjoining areas such as Noida, Gurugram, Faridabad and Ghaziabad.

In 2014, Delhi was declared as the most polluted city in the world based on particulate matter (PM) PM2.5 annual concentrations, with considerable health impacts on ~19 million inhabitants. In 2015, a strategic research programme was funded jointly by the Earth System Science Organization, Ministry of Earth Sciences (ESSO-MoES) and Department for Biotechnology (DBT), Government of India and Natural Environment Research Council (NERC) and the Medical Research Council (MRC), the United Kingdom to address the problem of health hazardous air pollution in Delhi and few sites in the United Kingdom.

The collaboration between UK and Indian researchers intended to develop cutting edge agenda to address issues of air pollution and human health in a developing megacity - New Delhi. Five major research projects under the joint study included ASAP-Delhi, DelhiFlux, PROMOTE, DAPHNE and CADTIME.

As part of the joint study, Delhi Air Pollution Health and Effects (DAPHNE), the All India Institutes of Medical Sciences (AIIMS) and Guru Teg Bahadur (GTB) Hospital provided wearable pollution-monitoring sensors to about 150 school-going asthmatic children and pregnant women in Delhi. Such wearable sensor based systems have a lower participant burden compared to older personal exposure systems. Also, the low weight and noise reduced systems helped scientist to generate high quality of exposure data. It also enabled scientist to study exposure monitoring of children 3 years of age who face major health threats.

Under DelhiFlux study, researchers from the CSIR-National Physical Laboratory (NPL), Delhi, University of York and Lancaster University carried out biomass burning experiments at NPL. Under this study, VOC, NO<sub>x</sub>, CO and organic aerosol emissions from biomass burning was recorded. All such compounds contribute significantly to smog formation and their accurate quantification allows emission inventories to be refined. Besides, this will increase the understanding of researchers about the main causative agents of air pollution in Delhi.

In 2018, team CADTIME conducted interviews with air quality experts and focus groups in different commercial, industrial and residential wards of Delhi in order to develop practical solutions to deliver clean air for Delhi. Team tried to engage different stakeholders to generate awareness, activities, and identify the barriers to air pollution control.

Under DelhiFlux research initiatives, equipment shipped to India shall be used in measuring pollutant fluxes over the Delhi. Other efforts include setting up of sites at IIT Delhi, NCR periphery, upwind, and a city centre location for measuring pollution parameters. Resulted have indicated that reliable accurate data from such studies shall play an important role in shaping the future of air pollution related health research in India.

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