Clean Air for Delhi 2010 and Beyond - An Operational Program to Forecast Daily Air Quality and Pollution Alerts

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In urban India, the increasing air pollution poses a serious threat to human health, such as increased incidences of chronic bronchitis, cancer of the respiratory tract, asthma, and induced premature mortality. This triggered a strong environmental movement that forced the government to take the matter seriously; evident in the revision of the air pollution standards in November, 2009.

In the National Capital Region (NCR) of Delhi, spreading ∼1500 km2, frenzied motorization and construction activities accounts for bulk of the air pollution. This includes direct vehicle exhaust and resuspension of road dust, especially along with heightened construction areas, and a large industrial sector in and around the city limits. The pace of the problem was overtaking the ability to mitigate it.

While the message is clear with the air pollution challenge, the Delhi government officials implemented solutions ranging from technical to infrastructure to information dissemination, within a short time-frame. One such activity is an advanced notification system on daily air quality, which is developed with financial support from the French Government under the "Clean Air for Delhi 2010 and Beyond" program, in technical collaboration with the Central Pollution Control Board (CPCB) in Delhi, India.

The program has a geographical resolution of one kilometer, covering an area of 52 km north to south and 52 km east to west, which means that a forecast is available for every nook and corner of NCR, including the transport, residential, and industrial hot spots, and special points of interest, such as venues during the Commonwealth games. Moreover, three elastic ground-based backscattering lidars in the UV region, produced by Leosphere were deployed in the outskirts of New Delhi to measure optical properties of the aerosols in the covered area. This program is designed to provide pollution alerts to the public and the media and hopefully minimize the instances of higher health impacts in the future for better health. As part of the outputs, the air quality index (AQI) ranging between 0 and 500, is also estimated for various parts of the city and published as a common denominator for multiple pollutants. The system can also be utilized for air pollution management by studying scenarios to control pollution and evaluate the impacts of implementation of projects on air quality.

This paper presents an overview and lessons learnt during the development and implementation of a 48 hour air quality forecasting system for NCR, made operational during the 2010 Commonwealth Games, aimed at providing detailed day-to-day multi-pollutant information to the public and the media.