

FROM THE
LAB

A WEEKLY UPDATE FROM INDIA'S FINEST RESEARCH INSTITUTES

A mobile sensor to monitor pollution

SM SHIVA NAGENDRA,
IIT MADRAS; **UWE SCHLINK** OF
HELMHOLTZ CENTRE FOR
ENVIRONMENTAL RESEARCH, LEIPZIG

AIR POLLUTION is slowly becoming a huge concern in urban areas in India. People are becoming more aware of it and authorities are taking steps to effectively monitor and contain air pollution. We already have a national air quality monitoring programme for the last several years.

Sponsored by the Indo-German Centre for Sustainability at IIT Madras, our group, in collaboration with the Helmholtz Centre in Leipzig, has been working on an air quality management system to study the vulnerability and health risk due to air pollution. We are studying air quality at a few 'hotspots' such as a busy commercial area in an urban centre where traffic is likely to be very high, at an industrial site, at waste dumping sites or a near a waste-water plant for example. Our effort is to try and understand the kind of exposure people have to the various pollutants, and then correlate this with hospital data to get indications of associated health risks.

We are carrying out our study in Chennai for the last one year. We are looking at particles of sizes between 10 microns to 300 nano metres, and even smaller, to understand the kind of impacts they have on human health.

Most of the air quality data in India come from stationary monitoring stations. They measure concentrations of pollutants that are location specific. We have been trying to move around our monitoring instrument in order to capture the spatial variability of pollutant concentration. Air quality is a dynamic system. It changes with wind speed and wind direction. Our effort is to study spatial navigation of pollutants and develop spatial concentration maps of pollutants in a 2 square km area, for example. People move around. They are not stationary throughout the day. As a result, their exposure to pollutants will differ and the health impacts would be different.

There can be important consequences of our research, for example in activity management or even in developing remedial measures. We can develop pollutant concentration variability maps of a given area and design engineering solutions like installing wind barriers or having plantation to miti-

THE RESEARCH

Collecting pollutant concentration data using mobile monitoring equipment to develop better air quality management systems.



ferent sources of pollution at any given place. We can design a workplace, or plan daytime activities, in such a way that it falls in a relatively low emission zones.

Concentration maps can also help in more accurately linking a pollutant to a health risk. We will need to correlate hospital data with our own study. We already have a few health experts from local hospitals in Chennai, and National Environmental Engineering Research Institute (NEERI), Nagpur, working with us on this project.

Another idea that we are exploring, but is not part of this project, is the use of low-cost sensors which can be moved around. The stationary monitoring stations have very sophisticated instruments that are extremely accurate. But they also have very high operation and maintenance costs. Data collected by our moving sensor can complement the data picked up by the monitoring stations to get a more clearer picture of air quality, and help us devise better air quality management systems.

(For your research to be considered