

Fine Particles over an Ecologically Sensitive Zone- Source Apportionment, Visibility and Climate Effects

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This study will measure fine particulate matter (fine PM) concentrations at an ecologically sensitive zone (Van Vihar National Park) within Bhopal city to characterize fine PM, apportion its sources, and assess the visibility and climate impacts of these sources. Measurements will be made over a period of two years. Fine PM mass concentrations data along with organic and elemental carbon (OC/EC), inorganic anions/cations, water soluble organic anions, and trace element concentrations will be generated.

The dataset will be used to apportion the contributions from various sources that result in the measured fine PM mass concentrations using advanced receptor models. These results, in conjunction with the meteorological data collected on-site and satellite data, will be used to identify potential locations of local and regional sources. Visibility degradation due to fine PM at the receptor site will be monitored using on-site photography, nephelometry, and transmissometry. Measured optical will be used in conjunction with the source apportionment results to estimate source-specific radiative forcing (to assess the climate impacts) of ambient PM over the study site.

This project is aimed at significantly enhancing our understanding of the sources of visibility reduction over ecologically sensitive locations in Central India, quantifying the radiative forcing (climate effects) of such sources, and providing background information for future source apportionment and PM induced plant/animal health effect studies.