

Tackling Issues of Growing Air Pollution

UKIERI facilitated faculty exchange between University of Surrey and Indian Institute of Technology Delhi

Concerns over emerging pollutants such as airborne ultrafine particles in developing countries (e.g. India) are much more severe than in European environments. This is because the latter have stricter emission control measures derived by stringent regulations, use of advanced emission control technologies and cleaner fuels in vehicles. Besides, efficient lane driving and better road surfacing are other important attributes that reduce the emissions of airborne particles in developed world. This recognises the need for collaborative efforts across disciplinary boundaries of engineering, public health and social science for sustainable outcomes and policy recommendations in the area of environmental dispersion and pollutants exposure. Sharing the knowledge internationally makes such collaborations more meaningful and easy to address often-complex science questions. The UKIERI grants, awarded independently to both the UK (Dr. Prashant Kumar) and Indian (Prof. Mukesh Khare) researchers, offered a unique opportunity to consolidate collaboration for developing possible postgraduate curriculum and research strategy in the area of ambient ultrafine particles by means of both field and wind tunnel studies.



The interactions through the UKIERI project have resulted in numerous outcomes, starting from publications of over half a dozen journal articles, to a joint PhD supervision, to submission of a multi-partner EPSRC-DST research bid. In addition, several other research plans including contribution to the development of wind tunnel facilities in India and future exchange visits of the PhD researchers were put in place to share the knowledge and advance understanding of both conventional and emerging issues of air pollution. The collaborative activities also attracted involvement of various top level industries from both India and the UK (e.g. TATA Motors and Steel).



All these activities have notable long-standing impacts by means of capacity building and knowledge sharing in the area of urban air pollution. The exchange was equally beneficial to the undergraduate, post-graduate and PhD researchers since specialised lectures were delivered by both the researchers during their visits at their host institutes besides personal interactions with the students. Furthermore, both the researchers were benefitted by working in two different megacity environments (i.e. Delhi and London). This unique interaction provided them a wider insight to understand the complex dispersion and transformation processes associated with ambient particulate matter and ultrafine particles. This is because the sources (i.e. quality and type of fuel used in vehicles), meteorological, topography and traffic conditions in Delhi are substantially different than those found in a European environment.

“The UKIERI funding enabled personal interactions with academic partners, their collaborators, colleagues and research students, that acted as an excellent seed to plant juvenile ideas and turn them into full grown projects” by *Dr. Prashant Kumar, University of Surrey, UK*

The collaboration visits by both the researchers proved as a catalyst to jointly develop the research ideas in the area of measurements and physical modelling of air pollution, along with on emerging pollutants such as ultrafine particles. In the quest of tackling issues of growing air pollution and developing sustainable strategies, this collaboration will be sustained in the future through the research links developed during the project and by targeting future funding opportunities for joint research bids.

“The UKIERI Staff exchange funding proved to be ‘stream tube’ enabling the researchers to smoothly carve out a definite path for sustainable research collaborations” by *Prof. Mukesh Khare, Indian Institute of Technology Delhi*.