



Atmospheric Pollution and Human Health in an Indian Megacity

Announcement of Workshop

Delhi, India 11-13 May 2015

The deadline for applications is 16:00, Monday 16 March 2015.

The Natural Environment Research Council (NERC) is inviting applications from UK scientists to attend a jointly organised workshop with the Ministry of Earth Sciences (MoES) in Delhi, India on 11-13 May 2015 on the subject of atmospheric pollution and human health in an Indian megacity. The RCUK India Office has facilitated the development of this collaboration and will be assisting in the running of the workshop. The aims of the workshop will be:

- To facilitate networking, discussion and enable researchers to share ideas on key research questions.
- To define the scope of a new UK/India interdisciplinary call, supported by the Newton-Bhabha Fund, with a focus on atmospheric pollution and human health research in Delhi which will contribute to the economic development and welfare of India.
- To explore opportunities for future collaboration in the area of urban atmospheric pollution and human health and, where appropriate, their associated societal impacts.

NERC have £5.5m to fund UK scientists in a future call in this area, of which £3m is provided by the Newton-Bhabha Fund.

Newton-Bhabha Fund

The Newton-Bhabha Fund is an initiative intended to strengthen research and innovation partnerships between the UK and emerging knowledge economies. The Fund forms part of the UK's **Official Development Assistance (ODA)** commitment which is monitored by the **Organisation for Economic Cooperation and Development (OECD)**¹.

ODA funded activity focuses on outcomes that promote *long-term sustainable growth* and is administered with the promotion of the economic development and welfare of the partner country as its main objective. The Fund will cover three broad categories of activity:

- **people:** improving science and innovation expertise (known as 'capacity building'), student and researcher fellowships, mobility schemes and joint centres
- **programmes:** research collaborations on development topics
- **translation:** innovation partnerships and challenge funds to develop innovative solutions on development topics

¹ <http://www.oecd.org/>

Background and Objectives of the Programme

Pollution in Indian cities is a rapidly increasing problem, with concentrations of particulate matter, sulphur dioxide and oxides of nitrogen frequently exceeding health regulation limits. A recent study has estimated excess mortality of around 10,000 in Delhi due to both cardiovascular and respiratory causes, based upon acute exposures alone². Furthermore, rapid growth in urban populations and additional factors such as high temperatures and solar radiation, co-located biogenic emissions, and wind-blown dust and soil, all result in exacerbation of the issue. A study in Delhi on the impact of exposure to airborne nanoparticles from road vehicles estimated around 500 premature deaths per million people in 2010 which could rise to almost 1900 deaths per million in 2030 under a business as usual scenario. However, with vigorous mitigation measures under a best estimate scenario this would reduce to just 31 deaths per million people in 2030³, serving to illustrate the potential health benefits of air quality improvements.

The vision of this programme is to provide new knowledge on air pollution issues in a rapidly urbanising society and the evidence to support cost-effective measures for health improvements related to atmospheric pollutants in Delhi, India.

The environmental science objectives for the programme are:

- Detailed estimates of the quantitative attribution of toxic air pollutants to the sources responsible for them.
- Process studies involving atmospheric circulation and chemical processes, especially those leading to formation of more toxic secondary pollutants (e.g. ozone and secondary particulate matter).
- Development of low-cost monitoring technologies leaving a legacy capability for enhanced monitoring.
- Development of a numerical model of air quality allowing the testing of abatement options.

Although the call is primarily to study pollutants with established health/disease-relevant effects, there may also be funding opportunities to support a nested study that would explore more specific associations between known/potential environmental pollutant exposures and health/disease outcomes. Although a final decision is yet to be reached, NERC would also welcome applications to attend the workshop from researchers in relevant overlapping areas to the current call (biomedical, environmental exposure and health/disease, epidemiology etc.).

The workshop

The aim of the workshop will be to discuss the key science challenges that relate to the aims of this programme and how they could best be addressed. It will also facilitate networking, discussion and enable researchers to share ideas on key research questions relevant to this call. The outcome of the workshop will shape the scope of the call. This call will provide the opportunity for UK scientists to form substantial collaborations with Indian scientists to undertake research. Collaborations under the call will contribute to economic development and social welfare in India, in line with the Newton-Bhabha Fund's aims.

² Gujar, B.R., Jain, A., Sharma, A., Agarwal, A., Gupta, P., Nagpure, A. S. & Lelieveld, J. (2010) Human Health Risks in Megacities due to Air Pollution. *Atmospheric Environment* 44, 4606-4613.

³ Kumar P., Gurjar, B.R., Nagpure, A.S. & Harrison, R.M. (2011) Preliminary Estimates of Nanoparticle Number Emissions from Road Vehicles in Megacity Delhi and Associated Health Impacts. *Environmental Science & Technology* 45, 5514-5521.

⁵ Shindell, D., Kuylenstierna, J.C.I., Vignati, E., van Dingenen, R., Amann, M., Klimont, Z., Anenberg, S.C., Muller, N., Janssens-Maenhout, G., Raes, F., Schwartz, J., Faluvegi, G., Pozzoli, L., Kupiainen, K., Höglund-Isaksson, L., Emberson, L., Streets, D., Ramanathan, V., Hicks, K., Oanh, N.T.K., Milly, G., Williams, M., Demkine, V. & Fowler, D. (2012) Simultaneously mitigating near-term climate change and improving human health and food security. *Science* 335, 183-189.

It is planned that the workshop will start with a reception on the evening of 11 May 2015 and end at lunchtime on 13 May.

Attendance at the workshop does not automatically enable project bids to be submitted or guarantee funding. Conversely, absence from the workshop does not preclude bidding into the call that will follow the workshop.

To attend the workshop you must complete the expression of interest form, following the instructions provided on the form. The form, together with a CV of no more than two sides of A4, should be sent to atmospheric@nerc.ac.uk by 16:00, Monday 16 March 2015. Invited participants will be notified in the week commencing 23 March 2015. Submission of these documents will be taken as indicating availability on the dates of the workshop. The full workshop programme and further details will be available in April.

Applicants should outline their relevant area of expertise, any current overseas collaborations and links, and their personal rationale for being involved in the workshop. They should also state in which of the programme areas they have a specific interest. Please note that the total number of participants from the UK is limited and NERC will try to ensure a balance of different disciplines/expertise and the number of attendees from the same institution. It is expected that 15-20 UK participants will be invited.

NERC will cover all reasonable travel expenses for UK participants attending the workshop in line with NERC policy on recovering travel and subsistence. Accommodation and subsistence at the workshop in India will be organised and paid for by RCUK India. Please be aware that invited attendees will be required to book their own flights which will be reimbursed by NERC and apply for their own visa, with guidance from NERC.

For further information please contact:

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