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18 INDIAN INSTITUTIONS TO STUDY NITROGEN POLLUTION

Relevant for: Environment | Topic: Environmental Pollution - Air, Water, Soil & E-waste

Eighteen research institutions in India are among a group of 50 institutions — called the South Asian Nitrogen Hub (SANH) — in the United Kingdom and South Asia that have secured £20 million (about 200 crore) from the U.K. government to assess and study the quantum and impact of “nitrogen pollution” in South Asia.

While nitrogen is the dominant gas in the atmosphere, it is inert and doesn’t react. However, when it is released as part of compounds from agriculture, sewage and biological waste, nitrogen is considered “reactive”, and it may be polluting and even exert a potent greenhouse gas (heat trapping) effect.

“So far, we have focussed on carbon dioxide and its impact on global warming. Nitrous oxide (N_2O) is 300 times more potent than carbon dioxide but isn’t as prevalent in the atmosphere. However, this is poised to grow,” said N. Raghuram, Chairman, International Nitrogen Initiative (INI) and Professor of Biotechnology at Guru Gobind Singh Indraprastha University, New Delhi. “In the future, reactive nitrogen pollution will be a matter of significant global discussion and, unlike carbon, India and South Asia cannot wake up at the last minute, realising that it has no updated, scientific assessment of its inventory.”

Other than air pollution, nitrogen is also linked to the loss of biodiversity, the pollution of rivers and seas, ozone depletion, health, economy, and livelihoods. Nitrogen pollution is caused, for example, by emissions from chemical fertilisers, livestock manure and burning fossil fuels. Gases such as ammonia (NH_3) and nitrogen dioxide (NO_2) contribute to poor air quality and can aggravate respiratory and heart conditions, leading to millions of premature deaths across the world. Nitrate from chemical fertilisers, manure and industry pollutes the rivers and seas, posing a health risk for humans, fish, coral and plant life.

The Indian partner institutions are the Aligarh Muslim University, Centre for Marine Living Resources & Ecology, Council of Scientific & Industrial Research National Institute of Oceanography, Guru Gobind Singh Indraprastha University, Indian Council of Agricultural Research-Indian Agricultural Research Institute and National Rice Research Institute, Integrated Coastal and Marine Area Management Project Directorate- National Institute of Ocean Technology Campus, Indian Institute of Tropical Meteorology, Indian Ocean Rim Association Ecological Solutions, Jawaharlal Nehru University, Kalinga Institute of Industrial Technology, National Centre for Sustainable Coastal Management, National Physical Laboratory, Society for Conservation of Nature, Sustainable India Trust, The Energy and Resources Institute (TERI) University.

Last year, Dr. Raghuram led a consortium of researchers who assessed trends in nitrogen emissions in India, where NOx emissions grew at 52% from 1991 to 2001 and 69% from 2001 to 2011. Though agriculture remained the largest contributor to nitrogen emissions, non-agricultural emissions of nitrogen oxides and nitrous oxide were growing rapidly, with sewage and fossil-fuel burning — for power, transport and industry — leading the trend. The SANH will study the impacts of the different forms of pollution to form a “coherent picture” of the nitrogen cycle. In particular, it will look at nitrogen in agriculture in eight countries — India, Pakistan, Bangladesh, Nepal, Afghanistan, Sri Lanka, Bhutan and Maldives.

Tapan Adhya, Hub Co-Director for Science, who is from the Kalinga Institute of Industrial Technology, said: “High doses of fertiliser input of nitrogen to agriculture combined with low nitrogen-use efficiency means that research on nitrogen pollution must be a priority for South Asia. This is emphasised by the scale of nitrogen subsidies across South Asia at around $10 billion per year. Better nitrogen management will have huge economic and environmental benefits.”

Uttarakhand High Court dismissed a case filed by Baba Ramdev’s Divya Pharmacy that pleaded against sharing revenues from indigenous biological resources with local communities

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