



INI2020 virtual session, 4 May 2020

The curtain raised – exactly at 2 p.m.! About 300 scientists all over the world participated in the virtual conference, which was jointly organized by the INI 2020 Secretariat and the INI Steering Committee. *Nandula Raghuram*, *David Kanter* (INI Steering Committee), and *Markus Geupel* (Chair of INI 2020 Secretariat) welcomed the participants to this “curtain raiser”, which will be followed by the “real” INI 2020 which was postponed due to the Corona pandemic.

In his greeting words, Prof. Raghuram highlighted the political development of the last ten years: The Nitrogen issue has reached the political stage! This is both great and challenging. Markus thanked all contributors to organize INI 2020 and highlighted more than 400 scientific submissions. Somewhat 20 of them have been published in a [virtual poster session](#) for comment. He announced that it is a pity that we could not meet in Berlin today and that INI 2020 will probably take place in the first quarter, 2021.

In his introductory statement ([video message](#)), *Prof. Dirk Messner*, President of the German Environment Agency underlined the links between the nitrogen issue on one hand and climate policy, food security, and biodiversity. There will be no sustainable world without sound management of reactive Nitrogen compounds. He stressed the necessity of an equal distribution of N around the world and to combat emissions. Coordinated national Nitrogen budgets are necessary for global success, said Messner. He presented Germany as an example: Germany has to reduce the emissions of reactive Nitrogen by 500 kt annually until 2030. A rational transformation is under way focusing the agricultural sector and emissions from industry and traffic, but also striving food, leisure etc. Measurable and enforceable tools are needed, e.g. requirements for the application of farm manure. As Messner outlined, national policies will be most successful when they are embedded in international policy, targets and conventions. Therefore, the SDGs are of outstanding importance for a global Nitrogen management.

In her keynote on “The current state of nitrogen around the world”, *Prof. Xin Zhang* (University of Maryland Center for Environmental Science, USA), started with some satellite images demonstrating the massive reduction of NO₂ pollution in China and Europe at the peak of the pandemic crisis. Policy is challenged by two facts: 1) While we are adding about 187 Tg of reactive Nitrogen (N) to the earth system, only 30 Tg was consumed by human as food, fiber, and fuel product. 2) While many world regions, including most areas of Europe, America, and East Asia, are having “too much” N added to the environment, many other regions (e.g., many countries in Africa) are facing “too little” N for agricultural production. Unfortunately, N use efficiency has decreased for many years e.g. in some large countries like China, though some countries have made progress like France. The evaluation of numerous data shows that improving N use efficiency requires not only technological advancement, but also improvement in socio-economic conditions. Systematic changes are necessary beyond crop farm and throughout the food system. (*Slides verlinken*)



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Prof. Mark Sutton (UK Centre for Ecology and Hydrology) gave a speech on “International policy developments on nitrogen”. He drew a picture with many facets including the general challenge of nutrients, where nitrogen is one among others. And he mentioned reactive nitrogen compounds poisoning air, aqueous systems and oceans. Mark introduced the approach of the **International Nitrogen Management System (INMS)**, integrating all relevant source and sinks. He highlighted the goal to “Halve Nitrogen Waste”. Thanks to the growing link between policy and nitrogen management, progress in some regions like South Asia is on the way. Many governments are now working on this issue using the [UNEA 4-14 resolution](#) as a basis. Mark presented ten key actions for nitrogen management. He also highlighted that a joined-up perspective offers multiple win-wins instead of fragmented approaches. The Interconvention Nitrogen Co-ordination Mechanism (INCOM), which is based on the UNEA resolution, should be looked at as a milestone on the road towards sustainable Nitrogen management. (*Slides verlinken*)

Virtual conferences require more breaks than face-to-face meetings. After the Keynotes an animated video, which illustrates the relation of nitrogen to the UN Sustainable Development goals, has been shown. [The video](#) was created by Deutsche Umwelthilfe (a German NGO) with financial support from the German Environment Agency. Links to more short videos can be found on the related [poster](#).

Prof. David Kanter (New York University) took over again and opened the roundtable dealing with “Nitrogen and the Sustainable Development Goals”. The panellists pointed out the challenges reactive Nitrogen poses to their region of the world and linked these issues to the SDGs.

Prof. Luiz Martinelli (University of São Paulo, Brazil) mentioned zero hunger (SDG No 2) due to lack of fertilizers in some parts of Latin America as well as highly polluted waste water (SDG No 6), and growing problems with air pollution by NO_x in many metropolitan areas.

Dr. Vincent Aduramigba (Obafemi Awolowo University, Nigeria) also mentioned SDG No 2 “zero hunger” as the most important link between Nitrogen and the SDGs. As to many conflicts in Africa, better economic conditions for people is key for peace and progress for environment policy. (Find out more about Vincents contribution *verlinken*)

They both deplored the political instability of many South American and African countries which hamper successful N management approaches.

Prof. Baojing Gu (Zhejiang University, China) underpinned the role of farmers in the Nitrogen issue. It is of outstanding importance to teach farmers the management of N, e.g. to stop the enormous NH₃ emissions from Chinese agriculture. Interaction of technique, data, and agriculture will help farmers to become better N managers. But this is also a socioeconomic challenge.

Prof. Ramesh Ramachandran (Ministry of Environment, India) focused on the pollution of sewage (SDG No 6) as the most critical problem leading to algae blooms, e.g. the “dead zone in the Bay of Bengal (SDG No 14). In South Asia, 80% of waste water is not treated. Besides sewage, air pollution in the large cities is increasing. He welcomed the international co-operation because this yields new and better scientifically based solutions. Read more... < [hier Beitrag Ramesh verlinken](#) >

Prof. Carly Stevens (Lancaster University, UK) mentioned the surplus problem of Nitrogen in many European countries and the regulations just in place to decrease concentrations of



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reactive Nitrogen. She proposed to demonstrate the benefits of reductions in nitrogen deposition to the politicians to foster solutions and regulations bringing this issue forward. *Prof. Susanne Schmidt* (The University of Queensland, Australia) highlighted that N use in Australian and New Zealand spans the extremes: intensive crop and animal production with excessive N inputs that generate N pollution, and extensive systems with low N input where soil N stocks are diminished.

In his reflections on the roundtable discussion, *Dr. Achim Dobermann* (International Fertilizer Industry Association, France) focused on the importance of national plans and Nitrogen budgets. On the global level, we have to cope with increasing consumption during the next 20 to 30 years. So, improving N efficiency and N recycling (use of manure and wastewater) are urgently needed. Africa is the biggest task with an increasing population and not enough food. More system thinking, innovation, and more recycling are needed to solve these problems. Despite all these challenges Achim expressed his view that the N problems can be solved in the long run: Translation of scientific results to industrial producers and to people working in agriculture is key for future success.

In his wrap-up, *Prof. Raghuram* mentioned that apart from agriculture, solid and liquid wastes including domestic sewage and wastewater are increasingly becoming important sources of N pollution in the developing world. He also highlighted the role of NO_x emitted from fossil fuel and its health impacts due to deposition on particulate matter. “Overall, nitrogen is a challenging issue because of multiple compounds to manage from multiple sectors of human activity, often governed by different ministries/departments.” Prof. Raghuram underlined the importance of the UNEA resolution, which is also a fruit of the long-standing work by INI. We all should ensure proper implementation of this resolution by generating scientific support and advocating evidence-based policies.

He thanked all speakers and participants for making this virtual meeting a grand success.

David Kanter let down the curtain after this prologue at 4:05 p.m. – let us raise the curtain again to start INI 2020 in the next year!

Henning Friege

INI 2020 Secretariat