8th GLOBAL NITROGEN CONFERENCE

30. MAY – 3. JUNE 2021 | BERLIN, GERMANY

Berlin Declaration on Sustainable Nitrogen Management for the SDGs

The 8th Global Nitrogen Conference (**INI2021)** was hosted virtually by the German Environment Agency during May 31-June 03, 2021, with more than 1000 participants from 60 countries. The participants have endorsed this document, the **Berlin Declaration,** calling for the sustainable management of reactive nitrogen compounds across all sectors of human activity as a crucial step towards achieving the UN Sustainable Development Goals (SDGs) by 2030.

We applaud the enormous scientific and political progress made since the first International Nitrogen Conference held in The Netherlands in 1998, recognizing the environmental impacts of a vital resource and generating scientific knowledge to support public and private efforts to manage nitrogen more sustainably.

We particularly applaud the resulting intergovernmental adoption of the first ever UN resolution on Sustainable Nitrogen Management in the fourth UN Environment Assembly (2019).

We recognize that better management of humanity's relationship with nitrogen is central to the success of the SDGs:

- Nitrogen is crucial to a healthy biosphere, given its role in sustaining life on land and below water, and is inextricably linked to the fate of carbon and other nutrients.
- The application of nitrogen inputs provides food and income to people across the world and has thus contributed substantially to reducing hunger and poverty. Still, lack of reactive nitrogen resources remains a critical challenge in the world's least developed countries, with nitrogen deficiency leading to soil degradation and food insecurity.
- The natural nitrogen cycle has now doubled in scale due to human activities, driven by intensive animal agriculture, over-fertilisation of agricultural land and fossil fuel combustion. Nitrogen's planetary boundary is one of only two (including biodiversity loss) that are estimated to have been substantially exceeded by humanity. The unique chemistry of the nitrogen cascade means that it exacerbates a range of environmental and human-health problems central to sustainable development, from air pollution and biodiversity loss in terrestrial and aquatic ecosystems, to climate change and pollution of drinking water.

- Over 2500 policies around the world touch on nitrogen management and loss. Two-thirds of policies in the agricultural sector focus on food production and economic development, leading to the underrepresentation of the environmental impacts of N use and its associated hidden costs. This illustrates the need to address the potential trade-offs and synergies between SDGs in nitrogen management policies.

We support ambitious goals at national and international scales, while acknowledging the unequal distribution of nitrogen use and loss across the world:

- The ambition to 'halve nitrogen waste'[1] by 2030, as agreed in the 2019 UN Colombo Declaration and recently embraced by a similar target in the EU Zero Pollution Action Plan, aligns with the current scientific understanding of the scale of ambition necessary to address the ecological and human impacts of nitrogen pollution.
- The International Nitrogen Initiative, with its global and regional representation of the relevant scientific community will continue to provide scientific support for evidence-based decisions at intergovernmental, regional and national levels, as a part of the "existing networks and platforms" and "existing relevant platforms" mentioned under (a) and (c) of the United Nations Environment Assembly (UNEA) resolution on Sustainable Nitrogen Management (UNEP/EA.4/L.14).

- Different countries and regions will necessarily prioritize different economic sectors and nitrogen sources depending on the distribution of nitrogen use and loss. The role of scientific advice and expertise is therefore especially important to enable targeted policy responses to the multiple challenges created by excess or insufficient nitrogen, considering it as an essential resource.

- The scientific community (INI) and other relevant stakeholders from civil society to industry and farmer organizations will support policy makers via the design and evaluation of integrated policy options. This includes:
    - Developing improved nitrogen management practices and technologies for widespread use at the farm-level,
    - Promoting recovery of nitrogen resources from animal manure, wastewater and industrial effluents,
    - Supporting the shift to healthy diets, based on foods with lower nitrogen footprints and a higher share of plant-based protein sources,
    - Educating relevant stakeholders and the general public on the dangers of N pollution to increase support for policy action.

[1]Total 'nitrogen waste'is considered as the sum of all forms of reactive nitrogen (N_r) pollution and loss, including anthropogenic denitrification to di-nitrogen (N_2), which is equally a waste of N_r resources. It includes both intentional and unintentional anthropogenic losses.

We, the scientists, practitioners and institutional representatives participating in INI2021 call for:

- A more prominent role for scientific advice in national and international policy processes, such as consideration of the recommendations from the First International Nitrogen Assessment, to be released in 2022. The International Nitrogen Initiative (INI) will play an important part in the UN Inter-Convention Nitrogen Coordination Mechanism (INCOM) in enhancing the role of science and evidence-based policy making to address the nitrogen challenge.
- More government and private sector funding for research, development, innovation, demonstration and deployment of new and existing technologies and practices that can help to achieve sustainable nitrogen management across all economic sectors, climates, agronomic conditions and development levels.
- Better coordination between the natural and social sciences to focus on research questions relevant to policy, including societal transition to more sustainable food and energy systems to enable holistic and coherent policies to improve nitrogen management.

We encourage the integration of sustainable nitrogen management objectives within environmental policy efforts across all scales to maximize the likelihood of improving humanity's relationship with nitrogen:

- Nitrogen management should be integrated within existing environmental policies, such as those focused on climate change, combating hunger and protecting biodiversity. This can be done while also developing new integrated national and international nitrogen policies that take a more coherent and easily communicable approach to nitrogen management in order to maximize synergies and minimize trade-offs. A promising example of this is the National Nitrogen Target proposed by the German Environment Agency.

- Holistic policy approaches require integrating the latest scientific understanding, particularly the need for systemic approaches to prevent, reduce and recycle nitrogen waste across the entire agri-food system (from fertilizer manufacturers to consumers) and beyond.

- Examples of best-practices exist on a regional level to promote integrated nitrogen management. For example, the Geneva Convention on Long-Range Transboundary Air Pollution (CLRTAP) especially considers impacts of nitrogen oxides (NO_x) and ammonia (NH_3) emissions in the context of the wider nitrogen cycle, and the South Asia Cooperative Environment Programme (SACEP) promotes regional co-operation on nitrogen and sustainable development.

Near-term opportunities to integrate sustainable nitrogen management within global policy efforts include:

- Make sustainable nitrogen management a focus of the UN Food Systems Summit in September 2021 – especially the post-Summit research and policy agenda – given its importance to delivering healthier, more sustainable and equitable food systems.
- Encourage the Parties to the UNFCCC to pay special attention to nitrous oxide (N_2O) as the third most abundantly emitted greenhouse gas, as new Nationally Determined Contributions (NDCs) are put forward in future Conferences of the Parties to the UN Framework Convention on Climate Change. Nitrous oxide mitigation is critical for reaching the Paris Climate Agreement's ambitious temperature targets. We welcome the #Nitrogen4NetZero initiative launched under the leadership of Sri Lanka in cooperation with the British High Commission ahead of the Glasgow Climate Conference (COP26). We welcome all countries to develop nitrous oxide mitigation targets under the principle of "common but differentiated responsibility" as well as other principles enshrined in the Rio Declaration on Environment and Development (1992) and reiterated in Rio+20.
- Support the establishment of a global nitrogen loss reduction effort in the post-2020 negotiations under the UN Convention on Biological Diversity linked to the Kunming Biodiversity Conference (COP15), building on the ambition outlined in the Colombo Declaration.
- Include integrated nitrogen management options in the review and potential future revision of the Gothenburg Protocol of the CLRTAP.
- Involve the International Nitrogen Initiative (INI) to support and enhance the Inter-Convention Nitrogen Coordination Mechanism, proposed in the UNEA-4/14 resolution on Sustainable Nitrogen Management, as an outcome of the GEF-UNEP-INI project "Towards International Nitrogen Management System (INMS)", so as to continue to play a crucial role in supporting and informing national and international efforts.

3 June, 2021

Endorsed by the participants of the 8th Global Nitrogen Conference (INI 2021)

Signed by:

Dr. Lilian Busse, Acting Vice-President of the German Environment Agency

Prof. Dr. Nandula Raghuram, Chair of the International Nitrogen initiative

Ass. Prof. Dr. David Kanter, Vice-Chair of the International Nitrogen initiative