UN Environment Management Group Nexus Dialogue on Sustainable Nitrogen Management

Concept Note

Background and context

Humanity's very existence depends on nitrogen, for agrifood production and as an essential element in all forms of life. Nitrogen is essential in its reactive forms - not in its pure form – in combination with other elements such as oxygen, hydrogen, carbon etc. The natural process of their formation, called "nitrification", and their restoration by "denitrification" back to pure elemental nitrogen was balanced till a century ago. This balance was however lost once humans learnt how to harness nitrogen from the air and turning it into ammonia, a key ingredient of nitrogen-based fertilizers. The amount of reactive nitrogen on the planet has increased enormously, without the matching ability to denitrify the addition amount leading to the accumulation of reactive nitrogen in the environment.

This significant increase of reactive nitrogen on the planet greatly enhanced food security and nutrition of a growing world population, but the alteration of the nitrogen cycle, with excess ammonia, nitrous oxide and nitrates emissions, also became a growing threat to the environment, impacting climate and greenhouse gas emissions, natural ecosystems and human health, and resulting in toxic tides, terrestrial eutrophication, biodiversity loss, lifeless rivers and dead zones in coastal areas. The threat is cross-cutting the triple planetary crisis, contributing seriously to the decline in air quality, loss of terrestrial and aquatic biodiversity, exacerbation of climate change, and depletion of the ozone layer.

Excess nitrogen in the environment is arising from multiple sectors: from agriculture, livestock, wastewater, industry, the energy sector, and transport systems. The scale of the problem is widespread and growing. The acknowledgement of the problem remains however limited outside certain (scientific) circles.

Since it is not nitrogen itself, but excessive environmental accumulation of unused reactive nitrogen that is posing a threat, sustainable nitrogen management seeks to balance efficient production, consumption, and utilization to avoid inefficient use and wastage. Farmers and agri-food stakeholders around the world are

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already applying technical solutions and good practices to reduce excessive reactive nitrogen losses. These solutions range from the best management practices for nitrogen fertilizer, exploiting bioremediation techniques, biological nitrogen fixation and manure application to croplands and grasslands to promoting circular bioeconomy approaches, possibly combined with ecosystem restoration practices.

Improving nitrogen use efficiency in agriculture and industry, increasing reliance on biological sources of nitrogen, strategies to reduce loss and waste with adequate approaches for nitrogen pollutants remediation, including microbial- or phyto- remediation to remove excess nutrients from soil and water, could support efforts to sustainable nitrogen management and reduce its threat, and in turn recover nitrogen that can be used in a range of products, such as food, feed or biomass. Likewise emission prevention and control, improved wastewater management and nutrient recycling from waste streams provide avenues to address various forms of nitrogen pollution. Science has shown that many national governments have an impressive capacity to reduce global nitrogen pollution without having to sacrifice much agricultural production. Overall, countries that cause 35% less nitrogen pollution than their neighbours only show a 1% larger yield gap.[1]

How a UN system-wide approach could support efforts to sustainable nitrogen management

Many entities in the UN systems touch upon parts of the nitrogen issue and a number of related actions have been undertaken by the UN system to improve nitrogen management. For example, FAO provides up-to-date statistics on nitrogen fertilizer use and nutrient budget and supports the implementation of the International Code of Conduct for the Sustainable Use and Management of Fertilizers. UNEP has raised awareness of the issue through its series on emerging issues relevant to the environment, assessment reports and through the Global Partnership on Nutrients Management (GPNM). It also has supported projects on sustainable nutrient management in coastal areas as well as nutrient recovery from wastewater. Various regional seas programmes and action plans address nutrients in the contexts of their protocols for the protection of the marine environment against pollution from land-based sources and some are developing action plans.

In 2019, at the fourth session of the UN Environment Assembly, Member States adopted UNEA Resolution 4/14 on Sustainable Nitrogen Management, which recognizes the need for better management of the global

nitrogen cycle. In March 2022, at the resumed fifth session of the UN Environment Assembly, a second resolution on Sustainable Nitrogen Management was adopted (Resolution 5/2) encouraging Member States to accelerate actions to significantly reduce nitrogen waste globally by 2030 and beyond through the improvement of sustainable nitrogen management. The resolutions call upon relevant United Nations bodies and multilateral environmental agreements to provide training and capacity support for policymakers and practitioners to develop widespread understanding of the issue and the opportunities for action.

Furthermore, in December 2022, at the 15th meeting of the Conference of Parties to the UN Convention on Biological Diversity, parties adopted the Kunming-Montreal Global Biodiversity Framework, agreeing to Target 7 to "*reduce pollution risks and the negative impact of pollution from all sources, by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects, including: reducing excess nutrients lost to the environment by at least half including through more efficient nutrient cycling and use (…)*."

It is evident that excess nitrogen poses a complex and cross-cutting global challenge. Every stage of the nitrogen cycle is linked to key environmental issues. In order to reduce the pressure on the planet, there is a need to seek solutions and synergies at all levels and take an integrated approach to tackle the problems caused by nitrogen pollution. To address global warming and protect biodiversity, it is vital to manage reactive nitrogen more efficiently and, where feasible, remove excess nitrogen from ecosystems and improve restoration.

Objectives

The aim of the nexus dialogue is to spur further understanding of the topic amongst EMG members and pave the way for a system-wide approach to sustainable nitrogen management, bringing different perspectives and strengths of UN entities and looking at synergies and policy coherence. The dialogue will provide the space for a concrete conversation about the linkages between nitrogen and food systems as well as climate change, biodiversity loss and environmental pollution. Finally, it also seeks to harness the strengths of the UN system to mobilize and support countries to address the various aspects and look into

improved policy coordination as well as scaling up integrated approaches contributing to sustainable nitrogen management.

Desired outcomes

The desired outcomes are:

- Improved understanding of the issue amongst EMG members and how the UN can help address these
- A stocktaking exercise that can help develop an initial mapping of existing efforts by the UN and encourage further plans and prioritization to address the thematic, sectoral and geographical dimensions of nitrogen pollution, and specifically:
    - Mandates and resolutions
    - Who is doing what?
    - Priority countries
    - Pollution hotspots
    - Key partners
- Agreement on the potential development of a six-month roadmap or a joint workplan to consider common messaging and awareness raising, better alignment of efforts between UN entities and improved modalities for policy coordination at all levels
- Ultimately, enhanced accessibility for policy makers to knowledge and tools to foster effective action.

Proposed action

In pursuance of resolution 4/14 and 5/2 on Sustainable Nitrogen Management, especially on issues of coordination of policies and actions for better management of nitrogen cycle in close collaboration with relevant UN bodies, including the FAO and multilateral environmental agreements (MEAs), the EMG, through its work towards a pollution-free planet, could play a key role in providing the enabling environment for UN bodies, including MEAs, to coordinate policies and action.

UNEP and FAO therefore propose that it would be beneficial to organize a one-day meeting with the support of the EMG secretariat and the participation of relevant UN bodies and MEAs to discuss the topic, map actions and discuss opportunities for improved collaboration, including on messaging and

understanding the issues as well as the policy actions, in the context of the EMG Nexus Dialogue series (Annex 1).

Bringing together the strengths of the UN in tabling the issue of nitrogen pollution together with related threats as well as showing the benefits of sustainable nitrogen management through clearly visible common action would create a win-win situation for the environment, food security, human health and the economy.

Tentative programme

Title: EMG Nexus Dialogue on Sustainable Nitrogen Management

Date: 20 April

Venue: UN Environment House, Geneva, Switzerland

Modality: In-person (with possibility for online participation by EMG members)

Time	Agenda items
9:00 – 10:00	**Introduction and Welcome** by UNEP, FAO and EMG secretariat (and any other partners-tbc), outlining objectives and structure
10:00 – 10:30	**Key Opening Interventions:** Addressing nitrogen pollution from source to sea
10:30 – 11:00	*Coffee break*
11:00 – 11:30	**Moderated Panel Discussions and Q&A** (break down into two or three sections)
11:30 – 13:00	**Small Group Dialogues** • Sustainable nitrogen use and access to innovations • Enhancing nitrogen use efficiency in crops and animal production • Reducing nitrogen pollution (waste and wastewater management) • Reducing nitrogen pollution (emissions) • Nitrogen policy and policy coherence • Ecosystem restoration
13:00 – 14:00	*Lunch break*
14:00 – 15:30	

15:30 – 16:00	**Small Group Dialogues** (continued) *Coffee break*
16:00 – 17:00	**Reporting back and Discussion**
17:00 – 17:15	**Way Forward**
17:15 – 17:30	**Concluding Remarks**

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Annex 1: Nexus dialogues

The EMG Nexus Dialogues allow participants to discuss the thematic and institutional interlinkages between environmental issues, frameworks, and agendas, in the context of the wider Sustainable Development Goals.

These Dialogues deliver coherent requirements and collaborative opportunities for UN agencies to support implementation of the environmental dimension of the 2030 Agenda – occasionally leading to the launch of formal EMG processes for promoting coordination and cooperation within the UN system. Ultimately, the Dialogues may trigger UN agencies to establish multi-stakeholder partnerships to strengthen policy coherence and integrated policy development in support of the 2030 Agenda and the SDGs. Most Dialogues are open to observers.

Past nexus dialogues have been organized by various UN agencies focusing on a wide array of topics. Whereas most dialogues lasted around 2 hours, however, some dialogues have been broken down to a series format having two or three dialogues over time on the same subject.

Below follows an overview of previous Nexus Dialogues:

2017 Nexus Dialogues

26 – 27 April 2017	The Nexus Approach and the environmental dimension of the 2030 Agenda.
13 – 14 July 2017	Poverty and Environment in the Sustainable Development Goals.
19 October 2017	Strengthening partnerships between the environmental and humanitarian sectors.
3 December 2017	Integrating the environment and health agendas into policies for urban settings.

2018 Nexus Dialogues

2 – 3 May 2018	Biodiversity Mainstreaming in the context of Human Security and Wellbeing.
23 October 2018	Greening with Jobs: A Just Transition to Sustainability.
19 November 2018	Law for environmental sustainability.

2019 Nexus Dialogues

24 January 2019	Environment, Peace and Security.
26 February 2019	Sustainable Infrastructure for the SDGs.
12 March 2019	Sustainable Food Systems (a dialogue at UNEA-4).

2020 Nexus Dialogues

14 – 16 July 2020	COVID-19 and the Environment: A 3-Part Series of Nexus Dialogues.
24 July 2020	Human Rights and the Environment: A 3-Part Series of Nexus Dialogues.
22 – 23 September 2020	Human Rights and the Environment: A 3-Part Series of Nexus Dialogues.

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17 November 2020	Mineral Resource Governance.

2021 Nexus Dialogues

29 – 30 March 2021	Gender and Biodiversity: A 2-Part Series of Nexus Dialogues.
27 April, 4 May and 15 June 2021	Addressing COVID-19 for the Environment: A 3-Part Series of Nexus Dialogues.
7 June 2021	Food System Resilience through Integrated Natural Resource Management.
7 September 2021	Sustainable Recovery through Sustainable Fashion: A Focus on the Environmental Dimensions.
23 November and 30 November 2021	Stockholm+50: A 2-Part Nexus Dialogue Series.

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