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Progress in the implementation of resolutions 4/14 and 5/2 on Sustainable Nitrogen Management.

Report of the Executive Director

Introduction

The present report provides an update on progress made in the implementation of resolutions 4/14 and 5/2 in terms of the requests in paragraphs a-f of resolution 4/14 and 3 a-e of resolution 5/2.

In its resolution 4/14 on sustainable nitrogen management, the United Nations Environment Assembly of UNEP requested the Executive Director of UNEP to:

- (a) Consider the
- (b) options for facilitating improved coordination of policies across the global nitrogen cycle at the national, regional and global levels, including consideration of the case for establishing an intergovernmental mechanism for coordination of nitrogen policies, based primarily on existing networks and platforms, and consideration of the case for developing an integrated nitrogen policy, which could enhance recognition of the need for common action across multiple policy domains;
- (c) Support, in close collaboration with relevant United Nations bodies, including the Food and Agriculture Organization of the United Nations and, as appropriate, multilateral environmental agreements, exploration of the options for better management of the global nitrogen cycle and how they could help to achieve the Sustainable Development Goals, including the sharing of assessment methodologies, best practice, guidance documents and emerging technologies for recovery and recycling of nitrogen and similar nutrients;
- (d) Coordinate existing platforms for assessment of the multiple environmental, food and health benefits of possible goals for improved nitrogen management, while ensuring coordinated management of relevant data to allow development of an integrated and sustainable nitrogen management approach and identify current information gaps, including in quantifying the net economic benefits for food and energy production; freshwater, coastal and marine environmental

** UNEP/EA.6/1.

- quality; air quality; greenhouse gas mitigation; and stratospheric ozone depletion mitigation, all underpinned by the development of reference values;
- (e) Facilitate, with relevant United Nations bodies, including the Food and Agriculture Organization of the United Nations and, as appropriate, multilateral environmental agreements, the provision of appropriate training and capacity for policymakers and practitioners to develop widespread understanding and awareness of nitrogen cycling and opportunities for action;
 - (f) Support Member States by, where appropriate, sharing existing information and knowledge in the development of an evidence-based and inter-sectorally coherent approach to domestic decision-making to promote sustainable nitrogen management, where appropriate;
 - (g) Report to the United Nations Environment Assembly at its sixth session on the progress achieved in the implementation of the present resolution.

In paragraph 3 of resolution 5/2 on sustainable nitrogen management, UNEA requested the Executive Director of UNEP to:

- (a) Support Member States, at their request, in the development of national action plans for sustainable nitrogen management, subject to the availability of resources;
- (b) Identify possible modalities for the options being considered for improved coordination of policies across the global nitrogen cycle at the national, regional and global levels, including, among other options, for an intergovernmental coordination mechanism for nitrogen policies, as specified in subparagraph (a) of resolution 4/14;
- (c) Present to the Committee of Permanent Representatives, at its 159th meeting, to be held in 2022, a briefing on the implementation of resolution 4/14, including on the status of the assessment requested in subparagraph (c) of the resolution, and a road map for further implementation of the resolution in the period leading up to the sixth session of the Environment Assembly;
- (d) Invite Member States to nominate focal points to join the United Nations Environment Programme Working Group on Nitrogen;
- (e) Report to the Environment Assembly, at its sixth session, on the progress achieved in the implementation of the present resolution and of resolution 4/14.

I. Progress in implementation of resolutions 4/14 and 5/2

UNEP Working Group on Nitrogen

The UNEP Working Group on Nitrogen was established pursuant to resolution 4/14 to follow up on the tasks set out in the resolution. Following UNEA resolution 5/2 the scope of the Working Group was expanded to facilitate the implementation of both resolutions and strengthen the engagement and ownership of their implementation by Member States and stakeholders.

On 30 August 2022 the Executive Director of UNEP invited Member States to nominate focal points and Co-Chairs to the Working Group. The appointment of the two Co-Chairs, Romania and India, was coordinated by the Committee of Permanent Representatives under the leadership of the President of UNEA-6. More than 75 focal points were nominated by Member States to the [Working Group](#).

The Working Group held five meetings. The first meeting was held online on 8 to 9 June 2020 and established an ad hoc Task Team; the second meeting was held online on 17 January 2023 to resume the work of the Working Group, the third meeting was held in a hybrid format in Bucharest, Romania, on 27 April 2023, followed by an informal expert meeting on 28 April; the fourth meeting was held in a hybrid format in Nairobi, Kenya, on 28 September 2023, followed by an informal expert meeting on 29 September; and the fifth meeting on 9 to 10 January 2024, followed by an informal expert half day meeting on 10 January. A summary^[X] setting out, among other things, potential options for continued work is made available for the consideration of Member States.

Voluntary National Action Plans

The Working Group shared information on voluntary national action plans, as available, according to national circumstances. Under the leadership of the Co-Chairs a baseline screening of existing actions and action plans was conducted that resulted in a voluntary national action plan with ten action areas.

Support Member States, at their request, in the development of national action plans for sustainable nitrogen management. Since its second meeting, the Working Group has made significant progress on identifying action areas for the consideration of Member States on the development of national action plans for sustainable nitrogen management. Recognizing that Member States are at different stages of action plan development/implementation, UNEP invited Member States who wish to develop national action plans to contact the secretariat¹, subject to the availability of resources.

Technical support provided to the Working Group through the Global Partnership on Nutrient Management (GPNM). As an outcome of the third meeting of the Working Group, the GPNM provided technical support to the Working Group through: a) information-sharing, technical webinars held between meetings, b) organization of informal expert [meetings](#) following the 3rd and 4th meeting of the Working Group, to allow for technical focal point [discussions](#) in an informal setting, and c) support Member States by, where appropriate, sharing existing information and knowledge in the development of an evidence-based and inter-sectoral coherent approach to domestic decision-making to promote sustainable nitrogen management, where appropriate.

International Nitrogen Assessment. UNEP presented an update on the progress of implementation of resolution 4/14 and 5/2 and a roadmap for further implementation of the resolution in the period leading up to the sixth session of the UN Environment Assembly to the [159th meeting of the Committee of Permanent Representatives](#) (2 September 2022), including on the ongoing work of the International Nitrogen Assessment developed under the UNEP/GEF project entitled “Towards the Establishment of an International Nitrogen Management System” (INMS). A summary of the assessment is being prepared for Member States, highlighting key messages, to be made available prior to UNEA-6.

Facilitating improved coordination of policies across the global nitrogen cycle

The Working Group considered possible options and modalities for improved coordination of policies across the global nitrogen cycle at the national, regional and global levels, including an intergovernmental coordination mechanism for nitrogen policies.

In close collaboration with relevant United Nations bodies, including the FAO and CBD, options for better management of the global nitrogen cycle have been explored. At the initiative of UNEP and FAO, the Environmental Management Group (EMG) held a [nexus dialogue on sustainable nitrogen management](#) in April 2023 to help achieve the Sustainable Development Goals. The outcome of the nexus dialogue recommended, amongst other things, that a mapping of mandates and activities to address nitrogen waste within the United Nations be done to ensure coherence and coordination of programs and related activities. Considering the input received from this dialogue, UNEP is mapping out mandates and activities of UN organizations on sustainable nitrogen management to enhance coherence in planning and implementing UN related initiatives on sustainable nitrogen management.

Several other joint activities with UN agencies have been conducted to improve the understanding and awareness of nitrogen cycling and opportunities for action policymakers and practitioners, such as a [side-event](#) organized with FAO during the pre-summit of the UN Foods Systems Summit in 2021 and a webinar on [Nitrogen challenges in Agri-food systems](#).

UNEP Guide on Legal, Policy, and Regulatory Frameworks for an Integrated Approach to Reduce Nitrogen Footprint from Sectors. The purpose of developing the guide is to support countries with information that can assist them to strengthen, develop, and implement laws, policies, and regulations to accelerate actions to significantly reduce nitrogen waste. This guide, which is being prepared in pursuance of resolution 5/2 and the Montevideo Programme V, recommends an integrated approach to address fragmentation in this area. The guidance on legal, policy, and regulatory changes required to reduce the nitrogen footprint from sectors to lead to the establishment of integrated regulatory and policy changes to reduce nitrogen waste globally will be completed by December 2023.

Strengthening the science-policy interface and addressing knowledge gaps

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Nitrogen (N) and phosphorus (P) mobilization due to agriculture, aquaculture and wastewater from households and industries has increased rapidly in recent decades. The N and P that have played a major role in boosting food production, have found their way into nearly every water body across the globe where they stimulate growth of aquatic plants.

UNEP supports the monitoring of the amounts of nutrients in coastal waters including SDG targets 14.1 “By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution”. UNEP in partnership with IOC-UNESCO and University of Utrecht calculated the amounts of nutrients (Nitrogen, Phosphorus and Silica) and the Index of Coastal Eutrophication Potential (ICEP) in coastal waters for the period 1900-2015. UNEP is currently working with IOC-UNESCO and Washington State University to calculate the non-riverine components of coastal nutrient input and the comparison between measured ICEP and harmful algae blooms (HAB) occurrence in susceptible coastal systems.

Adoption of the first Regional Nutrient Pollution Reduction Strategy in the Caribbean. In July 2021, The [Regional Nutrient Pollution Reduction Strategy and Action Plan for the Wider Caribbean Region](#) (RNPRSAP) was adopted by the 5th Conference of Parties (COP) to the Protocol concerning Pollution from Land-Based Sources and Activities (LBS Protocol), the only regional legally binding agreement on marine pollution, and subsequently by the 16th COP to the Cartagena Convention. The strategy provides a framework for increasing collaboration and action to reduce the impacts of excess nutrient pollution on priority coastal and marine ecosystems in the region. Where nutrient management in domestic wastewater is concerned, it recommends the expanded use of nature-based solutions in combination with hard engineering, the recovery of nitrogen and phosphorus, and reuse of treated sanitation waste as some of the best management practices.

Jamaica and Barbados first to implement Regional Strategy. Following the adoption of the Regional Nutrient Pollution Reduction Strategy and Action Plan (RNPRSAP) and through financing from UNEP’s Global Partnership on Nutrient Management (GPNM), Jamaica and Barbados benefitted from an Economic Valuation Pilot Project. Case studies for both countries, which are both Contracting Parties to the Protocol concerning Pollution from Land-Based Sources and Activities to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (LBS Protocol of the Cartagena Convention), were developed for national strategies on nutrients management. A [Regional Nutrient Workshop](#) was convened in Jamaica, in December 2022, for sharing of experiences and lessons learned from the nutrient case studies. This analysis supports the Cartagena Convention Secretariat’s efforts to develop new regional quantitative discharge standards for nitrogen, and possibly also for phosphorus.

Regional workshop on Index of Coastal Eutrophication (ICEP) and Harmful Algal Blooms (HABs) convened in Trinidad and Tobago. Through funding from the Government of Sweden (SIDA), the Trinidad and Tobago, Institute of Marine Affairs facilitated knowledge exchange among the Regional Activity Centres of the Protocols for Land-Based Sources of Marine Pollution (LBS) and Specially Protected Areas and Wildlife (SPAW) of the Cartagena Convention with technical support from the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) and the Institute of Marine and Coastal Research (INVEMAR). Policymakers were made aware of the science, trends, and work being done within the region to reduce nutrient pollution and the necessity to enact policies leading to pollution reduction and marine conservation. Training opportunities in water quality analysis, ICEP and HABs detection and monitoring were highlighted, including the capacities and new policies that may be needed to facilitate future reporting on this indicator. A framework was developed towards the implementation of regional monitoring and collaborative linkages formed in securing new investment opportunities for reducing risks to human health and coastal and marine ecosystem services.

Ecosystem health report cards in Chongming island (China) and Pulicat lagoon (India). These demonstration projects were developed to identify potential options for agricultural management surrounding Chongming island and Pulicat Lagoon to reduce greenhouse gas emissions and nutrient loads. Both projects were implemented over the course of one year, between December 2020 and November 2021. Major outcomes from these projects were the development of ecosystem health and nitrogen report cards and an integrated nutrient management plan (with recommendations for enhanced nitrogen use efficiency).

Nutrient recovery from wastewater in India. In December 2021, a demonstration project on the topic of [nutrient recovery from wastewater](#) was developed and implemented with an aim to assess the best available treatment options/techniques for the recovery of nutrients from wastewater to prevent

eutrophication and promote further reuse. The completion of this project saw the development of an ecosystem health report card based on water quality parameters, and a stakeholder engagement workshop to discuss the findings from the study with relevant stakeholders and members from the government. The success of this project has led to the development of a follow-up phase to expand the scope of work.

Development of regional criteria for Nitrogen (N) and Phosphorus (P) contained in wastewater discharges and other effluents from both domestic and industrial sources in the Wider Caribbean Region. Through funding from the Government of Sweden (SIDA), the LBS Regional Activity Centres, the Institute of Marine Affairs (IMA) in Trinidad and Tobago and the Centre of Research and Environmental Management of Transport in Cuba (Cimab) have conducted a desk review of information on nutrients management and standards in the Wider Caribbean Region. The outcome of this study which included responses to a survey of all countries in the Wider Caribbean Region, is to collate information on national N and P discharge standards and/or criteria, and enable the formulation of recommendations for possible adoption of regional standards and/or discharge criteria for N and P contained in domestic and industrial sources.

Regional environmental data and information platform launched integrating nutrient-related data in the Caribbean. This [regional platform](#) includes all the information generated in the development of the [State of the Cartagena Convention Area \(SOCAR\) Report](#) and the [State of Nearshore Marine Habitats in the Wider Caribbean](#) and will facilitate the compilation of information from national monitoring and assessment programmes, strengthen science-policy linkages, support regional reporting on international agreements and the monitoring of the Regional Nutrient Pollution Reduction Strategy and Action Plan. The platform was developed for Contracting Parties of the Cartagena Convention by the University of Geneva and benefits from experiences of the Barcelona Convention Secretariat.

East Asian Seas Nutrients Reduction Strategy to be presented at COBSEA IGM 26. COBSEA's 25th Intergovernmental Meeting considered a draft strategy on “*Reducing Nutrient Excess in the Watersheds and Seas of East Asia*” (RENEWSEAS) based on an earlier [desk review](#) and as a follow-up to UNEA Resolutions on 4/14 and 5/12. The RENEWSEAS draft nutrients strategy proposes six objectives in addressing the nutrients challenge in the region: optimizing nutrient use for crops, recovering and reusing water and nutrients, reducing effluents, accounting for nitrogen enriched submarine groundwater discharge, reduce risk of coastal eutrophication, and reduce risks to coastal ecosystems, livelihood, and public health. It is expected that the draft RENEWSEAS strategy will be presented to COBSEA's 26th Intergovernmental meeting in 2024 for consideration/adoption.

GEF8 Clean and Healthy Oceans Integrated Programme Proposals in the Seas of East Asia. The COBSEA Secretariat supported the governments of Cambodia, Philippines, and Thailand in developing expressions of interest for the GEF call for [Clean and Healthy Oceans Integrated Programme](#) (CHO IP). The objective of the GEF8 CHO IP is to address marine hypoxic zones by curbing coastal pollution from agriculture, industrial and municipal sources through policy and regulatory measures and infrastructure investments combined with nature-based solutions. These proposals aim to jumpstart the RENEWSEAS draft regional nutrients strategy, while increasing country level activities on nutrient policy and management, including on sustainable nitrogen management.

Capacity for the assessment of eutrophication using modern satellite-based remote sensing techniques becomes critical to support management decision in the field of policy development. For instance, an interactive tool for assessment of coastal eutrophication potential, the Global Eutrophication Watch, engaging the Google Earth Engine (GEE) has been developed within the framework of the Northwest Pacific Action Plan (NOWPAP). The tool uses a regional eutrophication assessment methodology, the NOWPAP Eutrophication Assessment Tool, designed for coastal eutrophication assessment based on the satellite-derived chlorophyll-a. The Global Eutrophication Watch also conducted a cost-effective assessment eutrophication in the Wider Caribbean Region.

Wastewater: Turning Problem to Solution – a UNEP rapid response assessment. The [report](#), developed jointly by UNEP, [Global Wastewater Initiative](#) (GWWI), and GRID-Arendal was launched in August 2023. This report showcases the potential of wastewater as a valuable resource and highlights the opportunities of recovering and reusing nutrients from wastewater.

Communications and Advocacy

Nitrogen pollution is one of the most pressing pollution issues to date, but more awareness and advocacy is needed. Stronger communication and advocacy can help set the agenda to combat nitrogen pollution. The Global Partnership on Nutrient Management (GPNM) provides a forum for the dissemination and communication of information on sustainable nitrogen management, including related to the implementation of UNEA resolutions 4/14 and 5/2. The GPNM has co-organized information expert groups meetings in conjunction with the meetings of the UNEP Working Group on Nitrogen and developed a webinar series in support of the working group.

Several communication products have been developed to scale outreach and raise awareness on nitrogen pollution and its impacts. The [interactive banner](#) explains why the world needs to limit nitrogen pollution, creating a user journey through the various sources, impacts and solutions to tackle the imbalance of nitrogen production, while the [long-form interactive story](#) provides a more in-depth analysis on the challenges of nitrogen pollution. Web stories such as [why the world should limit nitrogen pollution](#) and [why nitrogen management is key for climate change](#) are two examples of a suite of web stories that will be featured under the [#BeatNitrogenPollution](#) page.

Related knowledge materials highlight the complexity of the topic. Various knowledge materials and publications were made available during the reporting period and are mentioned here as complementary to the implementation of the resolution, even if developed in response to other resolutions. This includes a foresight brief on [sargassum: brown tide or golden jewel](#) (2021) as well as the synthesis report on the [Environmental and Health Impacts of Pesticides and Fertilizers and Ways of Minimizing Them](#), (2022) which was developed by the UNEP in close collaboration and consultation with the Food and Agriculture Organization and World Health Organization in response to UNEA Resolution 3/4. The latter presents a comprehensive review of available information on environmental and health effects and their potential impacts. The report seeks to improve the understanding of current pesticide and fertilizer use practices; present major environmental and health effects of pesticides and fertilizers, during their life cycle, and identify key knowledge gaps; review current management practices, legislation and policies aimed at reducing risks in the context of the global chemicals, environmental and health agenda; and identify opportunities to minimize environmental and health impacts, including through proven and innovative approaches.

At the UNFCCC COP 28 UNEP will organize a side event titled “Wastewater and Nutrient Management: A Key for Climate, Water, Food and Energy Security.” The event provides a unique opportunity to highlight the role of nutrients and wastewater in climate change mitigation and adaptation, as well as for food, water and energy security and contributed to raising the profile and visibility of this topic.

II. Lessons learned

Lessons learned included identifying the need for/to:

- (a) **Policy action across the nitrogen cycle is highly fragmented**, which leads to a lack of coherence with sustainable management of other nutrients including phosphorus, carbon and potassium. Improved nutrient management requires strong inter-ministerial / interdepartmental coordination and collaboration at national level.
- (b) **Countries are at different stages of developing national action plans.** Greater support will need to be provided at the technical and institutional level, including capacity development for nitrogen assessments and management, and sharing of best practices and lessons learned.
- (c) **Data, information, and knowledge gaps** hamper efficient and sustainable nutrient management, including on pollution prevention, nutrient recovery, circularity, resource efficiency and ecosystem-based approaches.
- (d) **Broadened stakeholder engagement and ownership by Member States**, as witnessed through the increased number of focal points to the Working Group, has facilitated progress to further advance on the topic.
- (e) **Sharing best practices and experiences** on what works and awareness raising to foster greater cooperation and collaboration have been identified as key needs by countries.
- (f) **The Global Biodiversity Framework, particularly Target 7, and The Global Framework for Chemicals** provide new opportunities for strengthening policies, methodologies, tools, and approaches globally, regionally and nationally to support sustainable nutrient management.

III. Recommendations [and/or conclusions] and suggested actions

1. The Environment Assembly may wish to take note of, and welcome the completion of, the work of the UNEP Working Group on Nitrogen and the technical and policy recommendations options to accelerate actions to significantly reduce nitrogen waste globally by 2030 and beyond through the improvement of sustainable nitrogen management, as set out in the reports of the Working Group providing a summary of its work.^[1]
2. The Environment Assembly may wish to decide on the future direction of its work on sustainable nutrient management benefiting from the UNEP Working Group on Nitrogen and consider a greater focus on phosphorus, in particular. Further consideration could be given to establishing a subsidiary process under the auspices of the Environment Assembly.
3. The Environment Assembly may wish to invite Member States and relevant stakeholders who have not yet done so to join the Global Partnership on Nutrient Management.
4. The Environment Assembly may wish to invite Governments, the private sector, foundations, and other organizations to support the work of the United Nations Environment Programme on nutrients through voluntary financial contributions.

^[1] To be added