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International environmental policy and governance issues

# Progress in the implementation of resolutions 4/14 and 5/2 on sustainable nitrogen management

### **Report of the Executive Director**

# I. Introduction

1. The present report provides an update on progress made in the implementation of resolutions 4/14 and 5/2 of the United Nations Environment Assembly of the United Nations Environment Programme (UNEP) on sustainable nitrogen management, specifically the requests in subparagraphs (a)–(f) of resolution 4/14 and subparagraphs 3 (a)–(e) of resolution 5/2. In resolution 4/14, the Environment Assembly requested the Executive Director of UNEP to:

(a) Consider the 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;

(b) Support, in close collaboration with relevant United Nations bodies, including the Food and Agriculture Organization of the United Nations (FAO) 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;

(c) 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 quality; air quality; greenhouse gas mitigation; and stratospheric ozone depletion mitigation, all underpinned by the development of reference values;

(d) Facilitate, with relevant United Nations bodies, including FAO and, as appropriate, multilateral environmental agreements, the provision of appropriate training and capacity for

<sup>\*</sup> UNEP/EA.6/1.

policymakers and practitioners to develop widespread understanding and awareness of nitrogen cycling and opportunities for action;

(e) Support Member States by, where appropriate, sharing existing information and knowledge in the development of an evidence-based and intersectorally coherent approach to domestic decision-making to promote sustainable nitrogen management, where appropriate;

(f) Report to the Environment Assembly at its sixth session on the progress achieved in the implementation of resolution 4/14.

2. In paragraph 3 of resolution 5/2 on sustainable nitrogen management, the Environment Assembly requested the Executive Director 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, a briefing on the implementation of resolution 4/14, including on the status of the assessment requested in subparagraph (c) of that 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 UNEP Working Group on Nitrogen;

(e) Report to the Environment Assembly, at its sixth session, on the progress achieved in the implementation of resolution 5/2 and resolution 4/14.

# **II.** Progress in the implementation of resolutions 4/14 and 5/2

#### A. United Nations Environment Programme Working Group on Nitrogen

3. The UNEP Working Group on Nitrogen<sup>1</sup> was established pursuant to resolution 4/14 to follow up on the tasks set out in the resolution. Pursuant to resolution 5/2, the scope of the Working Group was expanded to facilitate implementation of the two resolutions and to strengthen the engagement in and ownership of their implementation by Member States and stakeholders.

4. On 30 August 2022, the Executive Director invited Member States to nominate focal points to join the Working Group. The appointment of the Co-Chairs, from India and Romania, was coordinated by the Committee of Permanent Representatives under the leadership of the President of sixth session of the Environment Assembly. More than 75 focal points<sup>2</sup> were nominated by Member States to join the Working Group.

5. By the sixth session of the Environment Assembly, the Working Group will have held five meetings. The first meeting was held online on 8 and 9 June 2020, and an ad hoc task team was established during that meeting; the second meeting was held online on 17 January 2023; the third meeting was held in a hybrid format in Bucharest on 27 April 2023 and was followed by an informal expert meeting on 28 April 2023; the fourth meeting was held in a hybrid format in Nairobi on 28 September 2023 and was followed by an informal expert meeting on 29 September 2023; and the fifth meeting will be held on 9 and 10 January 2024 in a hybrid format in Nairobi, followed by a half-day informal expert meeting on 10 January. A summary<sup>3</sup> setting out, among other things, potential options for continued work has been made available for the consideration of Member States.

### **B.** Voluntary national action plans

6. The Working Group has shared information on voluntary national action plans for sustainable nitrogen management, as available, according to national circumstances. Under the leadership of the Co-Chairs, a baseline screening of existing actions and action plans was conducted, which resulted in the creation of a draft voluntary national action plan with 10 action areas.

<sup>&</sup>lt;sup>1</sup> www.unep.org/nitrogen-management-WG.

<sup>&</sup>lt;sup>2</sup> www.unep.org/nitrogen-management-WG/Nitrogen-National-Focal-Points#.

<sup>&</sup>lt;sup>3</sup> https://wedocs.unep.org/20.500.11822/44579.

7. Since its second meeting, the Working Group has made significant progress in identifying action areas for consideration by Member States in the development of national action plans. Recognizing that Member States are at different stages in the development or implementation of their action plans, UNEP invited Member States that wished to develop a national action plan to contact the secretariat<sup>4</sup> for support, subject to the availability of resources.

8. As an outcome of the third meeting of the Working Group, the Global Partnership on Nutrient Management provided technical support to the Working Group through (a) technical information-sharing webinars<sup>5</sup> held between meetings; (b) the organization of informal expert meetings following the third and fourth meetings of the Working Group to allow for technical discussions among focal points in an informal setting; and (c) support to Member States in terms of the sharing of existing information and knowledge for the development of an evidence-based and intersectorally coherent approach to domestic decision-making to promote sustainable nitrogen management.

9. At its 159th meeting, the Committee of Permanent Representatives<sup>6</sup> received an update from UNEP on progress in the implementation of resolutions 4/14 and 5/2 and a roadmap for further implementation work in the lead-up to the sixth session of the Environment Assembly. UNEP provided information on the ongoing work of the International Nitrogen Assessment developed under the UNEP/Global Environment Facility (GEF) project entitled "Towards the Establishment of an International Nitrogen Management System". A summary of the assessment, highlighting key messages, is being prepared for Member States and is to be made available prior to the sixth session of the Environment Assembly.

# C. Facilitating improved coordination of policies across the global nitrogen cycle

10. The Working Group has 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.

11. Options for better management of the global nitrogen cycle were explored in close collaboration with relevant United Nations bodies, including FAO and the secretariat of the Convention on Biological Diversity. At the initiative of FAO and UNEP, the Environmental Management Group held a nexus dialogue, in April 2023, on sustainable nitrogen management<sup>7</sup> to help achieve the Sustainable Development Goals. The outcome of the nexus dialogue recommended, among other things, that a mapping of mandates and activities to address nitrogen waste within the United Nations system be done to ensure coherence and coordination of programmes and related activities. Taking into consideration the input received through the dialogue, UNEP is mapping the mandates and activities of United Nations organizations in relation to sustainable nitrogen management to enhance coherence in the planning and implementation of such initiatives.

12. Several other joint activities with United Nations agencies have been conducted to improve understanding and awareness of nitrogen cycling and the opportunities that exist for action by policymakers and practitioners. Such activities include a side event<sup>8</sup> organized with FAO during the Pre-Summit of the United Nations Food Systems Summit in 2021 and a webinar on nitrogen challenges in agrifood systems.<sup>9</sup>

13. Pursuant to resolution 5/2 and under the Fifth Montevideo Programme for the Development and Periodic Review of Environmental Law, UNEP has been working to develop a guide on legal, policy and regulatory frameworks for an integrated approach to reducing the nitrogen footprints of individual sectors. The aim is to provide countries with information that can assist them in strengthening, developing and implementing laws, policies and regulations to accelerate action to reduce nitrogen waste. The guide, which recommends an integrated approach to address fragmentation in this area, is due to be completed by December 2023.

<sup>&</sup>lt;sup>4</sup> Using the email address unep-nitrogenworkinggroup@un.org.

<sup>&</sup>lt;sup>5</sup> www.unep.org/events/online-event/closing-loop-nutrient-recovery-wastewater and

www.unep.org/events/webinar/sustainable-nitrogen-management-global-developments.

<sup>&</sup>lt;sup>6</sup> www.unep.org/events/cpr-meetings/159th-meeting-committee-permanent-representatives.

<sup>&</sup>lt;sup>7</sup> www.unemg.org/nexus-dialogue-sustainable-nitrogen-management/.

<sup>&</sup>lt;sup>8</sup> www.unep.org/events/webinar/sustainable-nitrogen-management-sustainable-food-systems.

<sup>&</sup>lt;sup>9</sup> www.unep.org/events/webinar/nitrogen-challenges-agri-food-systems-halve-nitrogen-waste-2030.

### D. Strengthening the science-policy interface and addressing knowledge gaps

14. Nitrogen and phosphorus mobilization from agriculture, aquaculture and household and industrial wastewater has increased rapidly in recent decades. The nitrogen and phosphorous 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 the growth of aquatic plants.

15. UNEP supports the monitoring of the amounts of nutrients in coastal waters, including in support of efforts to achieve target 14.1 of Sustainable Development Goal 14.<sup>10</sup> UNEP, in partnership with the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization and Utrecht University in the Kingdom of the Netherlands, calculated the amounts of nutrient (nitrogen, phosphorus and silica) in global coastal waters, and consequently the indicator for coastal eutrophication potential, for the period 1900–2015. UNEP is working with the Intergovernmental Oceanographic Commission and Washington State University to calculate the non-riverine components of coastal nutrient input and the occurrence of harmful algal blooms in susceptible coastal systems.

16. At its fifth meeting, in July 2021, the Conference of 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, also known as the Cartagena Convention, adopted the Regional Nutrient Pollution Reduction Strategy and Action Plan for the Wider Caribbean Region.<sup>11</sup> The Protocol is the region's only legally binding agreement on marine pollution. The strategy and action plan were also subsequently adopted by the Conference of the Parties to the Cartagena Convention at its sixteenth meeting. The strategy provides a framework for increasing collaboration and boosting action to reduce the impact of excess nutrient pollution on priority coastal and marine ecosystems in the region. With regard to best practices for nutrient management in domestic wastewater, the strategy recommends, among other things, the expanded use of nature-based solutions in combination with hard engineering, the recovery of nitrogen and phosphorus and the reuse of treated sanitation waste.

17. In terms of implementation of the strategy, thanks to financing from the UNEP Global Partnership on Nutrient Management, Barbados and Jamaica, both parties to the Protocol Concerning Pollution from Land-Based Sources and Activities, took part in a pilot project that led to the development of a case study for a national strategy on nutrients management. A regional workshop<sup>12</sup> was convened in Jamaica in December 2022 to enable the sharing of experience and lessons learned from the nutrient case studies. Such analysis supports the efforts of the secretariat of the Cartagena Convention to develop new regional quantitative discharge standards for nitrogen, and possibly for phosphorus.

18. Thanks to funding from the Government of Sweden, the Institute of Marine Affairs of Trinidad and Tobago held a regional workshop on the index of coastal eutrophication potential and harmful algal blooms to facilitate knowledge exchange among the regional activity centres of the Protocol Concerning Land-Based Sources of Marine Pollution and those of the Protocol Concerning Specially Protected Areas and Wildlife to the Cartagena Convention. The Institute received technical support from the secretariat of the Convention for the Protection of the Marine Environment of the North-East Atlantic and the Institute of Marine and Coastal Research of Colombia. Policymakers were made aware of the related science and trends, the work being done in the region to reduce nutrient pollution, and the need to enact policies aimed at pollution reduction and marine conservation. The capacities and new policies that might be needed to facilitate future reporting using the index of coastal eutrophication potential were also highlighted, along with opportunities for training in the use of the index itself, in water-quality analysis, and in the detection and monitoring of harmful algal blooms. A framework was developed with a view to improving regional monitoring and collaboration in order to secure new investment opportunities to reduce risks to human health and coastal and marine ecosystem services.

19. Demonstration projects were carried out to identify potential options for agricultural management in Chongming island, China, and Pulicat Lagoon, India, with a view to reducing greenhouse-gas emissions and nutrient loads. Both projects were implemented over the course of one year between December 2020 and November 2021. Major outcomes of the projects were the

<sup>&</sup>lt;sup>10</sup> By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

<sup>&</sup>lt;sup>11</sup> https://gefcrew.org/carrcu/19IGM/LBSCOP5/Info-Docs/WG.41INF.10Rev.1-en.pdf.

<sup>&</sup>lt;sup>12</sup> www.youtube.com/watch?v=LXPKQfQhIus.

development of ecosystem-health and nitrogen report cards and an integrated nutrient management plan with recommendations for ensuring more efficient use of nitrogen.

20. In December 2021, another demonstration project<sup>13</sup> was carried out in India with a view to ascertaining the best available techniques for recovering nutrients from wastewater to prevent eutrophication and promote their reuse. An ecosystem-health report card was produced using water-quality parameters, and a stakeholder engagement workshop was held to discuss the findings of the study with relevant stakeholders and members of the Government. The success of the project has led to the expansion of its scope.

21. Thanks to funding from the Government of Sweden, the regional activity centres of the Protocol Concerning Land-Based Sources of Marine Pollution, including the Centre for Research and Environmental Management of Transport in Cuba, and the Institute of Marine Affairs of Trinidad and Tobago conducted a desk review of information on nutrient management and related standards in the wider Caribbean region. The outcome of the study, which involved a survey of all countries in the wider Caribbean region, is the collation of information on national nitrogen and phosphorous discharge standards and criteria, with a view to enabling the formulation of recommendations for regional standards or discharge criteria related to nitrogen and phosphorous in domestic and industrial sources of wastewater.

22. A regional environmental data and information platform was launched integrating nutrient-related data from the Caribbean. This regional platform<sup>14</sup> includes all the information generated in the development of the reports entitled "State Of the Cartagena Convention Area: An Assessment of Marine Pollution from Land-based Sources and Activities in the Wider Caribbean Region"<sup>15</sup> and "The State of Nearshore Marine Habitats in the Wider Caribbean".<sup>16</sup> It will facilitate the compilation of information from national monitoring and assessment programmes; strengthen science-policy linkages; and support regional reporting on international agreements and the monitoring of the Regional Nutrient Pollution Reduction Strategy and Action Plan for the Wider Caribbean Region. The platform was developed by the University of Geneva for parties to the Cartagena Convention and benefits from the experience of the secretariat of the Convention for the Protection of the Mediterranean Sea Against Pollution.

23. At its Twenty-Fifth Intergovernmental Meeting, the Coordinating Body on the Seas of East Asia considered a draft strategy on reducing nutrient excess in the watersheds and seas of East Asia. The strategy had been developed on the basis of on an earlier desk review<sup>17</sup> and as follow-up to resolutions 4/14 and 5/2. The draft strategy proposes six objectives in addressing the nutrients challenge in the region. The objectives are to optimize nutrient use for crops; to recover and reuse water and nutrients; to reduce effluents; to account for nitrogen-enriched submarine groundwater discharge; to reduce the risk of coastal eutrophication; and to reduce risks to coastal ecosystems, livelihoods and public health. It is expected that the draft strategy will be presented for consideration and possible adoption at the Twenty-Sixth Intergovernmental Meeting in 2024.

24. The secretariat of the Coordinating Body on the Seas of East Asia supported the Governments of Cambodia, the Philippines and Thailand in developing expressions of interest in response to the GEF call for participation in its Clean and Healthy Ocean Integrated Programme.<sup>18</sup> The objective of the programme is to address marine hypoxic zones by curbing coastal pollution from agricultural, industrial and municipal sources through policy and regulatory measures and investment in infrastructure combined with nature-based solutions. The aim is also to jumpstart action in relation to the draft strategy on reducing nutrient excess in the watersheds and seas of East Asia, while increasing country-level activities on nutrient policy and management, including sustainable nitrogen management.

25. To support management decisions in the field of policy development, there needs to be a capacity to assess eutrophication using modern satellite-based remote-sensing techniques. An interactive tool for the assessment of coastal eutrophication potential, Global Eutrophication Watch, which uses the Google Earth Engine platform, has been developed within the framework of the Northwest Pacific Action Plan. The tool uses a regional methodology, the Northwest Pacific Action

<sup>&</sup>lt;sup>13</sup> www.unep.org/news-and-stories/story/how-reduce-pollution-delhis-waterways-study.

<sup>&</sup>lt;sup>14</sup> Home | Cartagena Convention (unepgrid.ch).

<sup>&</sup>lt;sup>15</sup> www.unep.org/cep/resources/report/socar-report.

<sup>&</sup>lt;sup>16</sup> https://wedocs.unep.org/handle/20.500.11822/36352.

<sup>&</sup>lt;sup>17</sup> https://apps1.unep.org/resolutions/uploads/cobsea nutrient pollution desk study -

compressed for igm.pdf#overlay-context=cobsea-working-docs%3Fq%3Dcobsea-working-docs.

<sup>&</sup>lt;sup>18</sup> https://www.thegef.org/sites/default/files/2023-05/GEF IP HealthyOceans 2023 05.pdf.

Plan Eutrophication Assessment Tool, which is designed for assessing coastal eutrophication using satellite-derived measurements of chlorophyll. Discussions are being held with the developers of Global Eutrophication Watch to assess its potential for replication in the wider Caribbean region.

26. The report entitled "Wastewater: Turning Problem to Solution: A Rapid Response Assessment",<sup>19</sup> developed jointly by UNEP, the Global Wastewater Initiative<sup>20</sup> and GRID-Arendal, was launched in August 2023. The report showcases the potential of wastewater to be a valuable resource and highlights the opportunities for recovering and reusing nutrients from wastewater.

### E. Communication and advocacy

27. Nitrogen pollution is one of the most pressing pollution issues at present, but more awareness of the problem is needed, along with more advocacy, to help set the agenda for combating nitrogen pollution. The Global Partnership on Nutrient Management provides a forum for the dissemination and communication of information on sustainable nitrogen management, including in relation to the implementation of resolutions 4/14 and 5/2. The Partnership has co-organized expert group meetings in conjunction with the meetings of the UNEP Working Group on Nitrogen and developed a webinar series in support of the Working Group (see section B above).

28. Several UNEP communication products have been developed to increase outreach and raise awareness of nitrogen pollution and its consequences. For example, an interactive banner<sup>21</sup> explains why the world needs to limit nitrogen pollution, taking the user on a journey through the various sources and impacts of and solutions to the imbalance of nitrogen production, while a longer interactive story<sup>22</sup> provides more in-depth analysis of the challenge of nitrogen pollution. In addition, a suite of web stories<sup>23</sup> will be featured on the #BeatNitrogenPollution page.<sup>24</sup>

29. Various other materials and publications relevant to the implementation of resolutions 4/14 and 5/2 became available during the reporting period, even if they were developed in response to other resolutions. They includes a UNEP Foresight Brief on sargassum<sup>25</sup> and the *Synthesis Report on the Environmental and Health Impacts of Pesticides and Fertilizers and Ways to Minimize Them*,<sup>26</sup> which was developed in close collaboration FAO and the World Health Organization in response to Environment Assembly resolution 3/4. The synthesis report presents a comprehensive review of available information with a view to improving understanding of current use of pesticides and fertilizers; presenting the major environmental and health effects of pesticides and fertilizers during their life cycle and identifying important knowledge gaps; reviewing current management practices, legislation and policies that aim to reduce risks in the context of the global chemicals, environmental and health impacts, including through proven and innovative approaches.

30. At the twenty-eighth meeting of the Conference of the Parties to the United Nations Framework Convention on Climate Change, UNEP will organize a side event entitled "Wastewater and nutrient management: a key for climate, water, food and energy security". The event will provide a unique opportunity to highlight the role of nutrients and wastewater in climate-change mitigation and adaptation and in food, water and energy security and contribute to raising the profile of the topic.

# III. Lessons learned

31. The lessons learned during the implementation of resolutions 4/14 and 5/2 include the following:

(a) Policy action across the nitrogen cycle is highly fragmented. This leads to a lack of coherence with efforts to ensure the sustainable management of other nutrients, including phosphorus,

<sup>&</sup>lt;sup>19</sup> https://wedocs.unep.org/handle/20.500.11822/43142.

<sup>&</sup>lt;sup>20</sup> www.unep.org/explore-topics/water/what-we-do/global-wastewater-initiative-gwwi.

<sup>&</sup>lt;sup>21</sup> https://hotspot.un.1000headsdev.com/.

<sup>&</sup>lt;sup>22</sup> www.unep.org/interactives/beat-nitrogen-pollution/.

<sup>&</sup>lt;sup>23</sup> For example, www.unep.org/news-and-stories/story/four-reasons-why-world-needs-limit-nitrogen-pollution

and www.unep.org/news-and-stories/story/why-nitrogen-management-key-climate-change-mitigation.

<sup>&</sup>lt;sup>24</sup> http://www.unep.org/beatpollution/nitrogen-pollution.

<sup>&</sup>lt;sup>25</sup> www.unep.org/resources/emerging-issues/sargassum-brown-tide-or-golden-jewel.

 $<sup>^{26}\</sup> www.unep.org/resources/report/environmental-and-health-impacts-pesticides-and-fertilizers-and-ways-minimizing.$ 

carbon and potassium. Improved nutrient management requires effective interministerial and interdepartmental coordination and collaboration at the national level.

(b) Countries are at different stages in the development of their national action plans. Greater support needs to be provided at the technical and institutional level, including in terms of capacity development for nitrogen assessments and management and for the sharing of best practices and lessons learned.

(c) Gaps in data, information and knowledge hamper efficient and sustainable nutrient management, including in relation to pollution prevention, nutrient recovery, circularity, resource efficiency and ecosystem-based approaches.

(d) Wider stakeholder engagement and ownership by Member States, as witnessed through the increase in the number of focal points joining the Working Group, has facilitated progress.

(e) Key needs identified by States themselves include the sharing of best practices and experiences and awareness-raising to foster greater cooperation and collaboration.

(f) The Kunming-Montreal Global Biodiversity Framework, particularly its target 7, and the Global Framework on Chemicals provide new opportunities to strengthen policies, methodologies, tools, and approaches globally, regionally and nationally in support of sustainable nutrient management.

### IV. Recommendations and suggested actions

32. 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 aimed at accelerating action to reduce significantly nitrogen waste globally by 2030, and beyond, through the improvement of sustainable nitrogen management, as set out in the reports of the Working Group.<sup>27</sup>

33. 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.

34. The Environment Assembly may wish to invite Member States and relevant stakeholders that have not yet done so to join the Global Partnership on Nutrient Management.

35. The Environment Assembly may wish to invite Governments, the private sector, foundations and other organizations to support the work of UNEP on nutrients through voluntary financial contributions.

<sup>&</sup>lt;sup>27</sup> https://wedocs.unep.org/20.500.11822/44579.