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**International environmental policy and
governance issues: science-policy interface**

Resolution 1/4: science-policy interface

Report of the Executive Director

Summary

The present report describes the progress made in the implementation of United Nations Environment Assembly resolution 1/4 on the science-policy interface, which is particularly relevant in view of the indicator and data needs for monitoring and reporting on the environmental dimension of the 2030 Agenda for Sustainable Development.

This report provides an update on UNEP Live, a web-based knowledge management system that provides contextualized data, information and scientific knowledge to keep the environment under review, and plans for its long-term development. UNEP Live is increasingly being used to underpin a variety of assessments including the six regional assessments that will form the building blocks for the sixth edition of the United Nations Environment Programme (UNEP) *Global Environment Outlook* (GEO-6). In addition, the report provides an update on other completed, current and planned assessments as well as on a number of other reporting processes.

The report also covers communications, partnerships such as the Eye on Earth Alliance, data gaps, and progress on internationally agreed environmental goals and policy instruments for a strengthened science-policy interface.

* UNEP/EA.2/1.

I. Introduction

1. Science plays a fundamental role in providing answers on how to address some of the greatest challenges of the twenty-first century in the context of sustainable development. It is central to the mandate of UNEP to keep the environment under review and inform society of the risks as well as the opportunities in dealing with modern technologies and new knowledge. Understanding how science can help inform better decision-making and strengthening of the science-policy interface is at the heart of UNEP work across the organization. It is also central to the evolution of many successful policies and environmental management plans. Impacts on the environment have often become apparent only many years after new products or substances were introduced, demonstrating the need to constantly review, assess and apply science for the benefit of the environment, translating its meaning for policymakers and the wider public.

2. The present report aims to provide the United Nations Environment Assembly of the United Nations Environment Programme (UNEP), at its second session, with an overview of the action that UNEP has been undertaking to strengthen the science-policy interface pursuant to resolution 1/4, and as called for in paragraphs 48, 76 (g), 85 (k), 88 (d) and 276 of the outcome document of the United Nations Conference on Sustainable Development, “The future we want”, endorsed by the General Assembly by its resolution A/RES/66/288 and in Governing Council decision 27/2 of February 2013. The report is structured in line with the specific actions requested in resolution 1/4.

3. With regard to the sixth edition of the UNEP *Global Environment Outlook* (GEO-6), the structure and process of the assessment were agreed at the Global Intergovernmental and Multi-stakeholder Consultation in Berlin in October 2014. Work on the six regional assessments underpinning the sixth edition commenced early in 2015, after the establishment of the various advisory bodies tasked with supporting the process, and the key regional issues were identified.

4. After an update on a number of other key environmental assessment processes and reports, the present report provides an overview of issues with regard to communicating key scientific findings, partnerships, data gaps and progress on globally agreed environmental goals, together with recommendations on policy instruments, as requested in resolution 1/4.

5. It concludes with a review of the web-based knowledge management system, UNEP Live, which continues to make significant progress, with quality-assured national data flows from more than 190 countries being made available to a global audience along with an array of other relevant knowledge assets and an indicator reporting information system that will continue to expand and diversify with the implementation of the 2030 Agenda for Sustainable Development adopted by the United Nations General Assembly in September 2015 (resolution 70/1).

II. Update on completed, current and planned assessments

A. The Global Environment Outlook process

6. The process to prepare the sixth edition of the *Global Environment Outlook* (GEO) assessment is a “bottom-up” process, starting with the compilation of six regional assessments, for Africa, Asia-Pacific, Europe, Latin America and the Caribbean, North America and West Asia, whose findings will provide key inputs for the ongoing global assessment; the six regions fall within the scope of the six regional offices of UNEP and, in a number of cases, key regional ministerial environment forums such as the African Ministerial Conference on the Environment, the Forum of Ministers and Environment Authorities of Asia Pacific, the Environment for Europe process, the Forum of Ministers of the Environment of Latin America and the Caribbean, and the Council of Arab Ministers Responsible for the Environment. The regional assessments are expected to feed into a variety of regional meetings and forums to support regional consensus-building and policy formulation. UNEP, in response to paragraph 9 of United Nations Environment Assembly resolution 1/4, has consulted with more than 600 nominated experts and representatives from 85 countries to ensure the uptake of regional priorities in the global assessment.

7. In early 2015, in accordance with the UNEP Live standard operating procedure of providing open access to data and knowledge and support for integrated environmental assessments, six Regional Environmental Information Network conferences were organized to discuss open access and data sharing in the context of UNEP Live and open data platforms, and to identify regional priority issues, trends and emerging issues of regional and global significance. Based on a set of criteria defining scale and potential impacts, a wide variety of economic, environmental, social and human

well-being-related issues were identified as emerging and crucial to the sustainable development of the regions. Given the multiplicity and global significance of those emerging issues, UNEP is further analysing the results with a view to producing evidence-based assessments of them and making the findings available to the international community for timely and adequate policy consideration.

8. Each region selected two assessment co-chairs and a team of authors was tasked with producing a zero draft prior to an inter-regional consultative process in September 2015 to produce the first draft. Subsequently, two rounds of review were conducted, generating extensive feedback from Governments, experts, major groups and stakeholders, and United Nations entities.

9. During a joint meeting in January 2016, members of the GEO-6 High-level Intergovernmental and Stakeholder Advisory Group and the Scientific Advisory Panel agreed to organize a series of regional meetings in March and April 2016, at which members of the High-Level Group would work to refine and agree on a two-page summary of key findings and policy messages to be presented to the United Nations Environment Assembly at its second session. The summary of key findings for each GEO-6 regional assessment will be taken forward as a basis for the global GEO-6 assessment and to support the delivery of the environmental dimension of the Sustainable Development Goals. The regional assessments will consist of a primary layer in interactive e-book format and a secondary layer available online containing supporting data and information.

10. Building on past and current experience with the various methodologies used to identify, prioritize and communicate emerging issues to Governments and the general public, UNEP has continued to develop, strengthen and render the GEO-6 process more structured, regular and inclusive in order to engage a broader pool of stakeholders and generate results that speak to a wider audience. The streamlined process is expected to contribute substantively to the production of the Global Sustainable Development Report, in which UNEP is fully engaged.

11. A number of preliminary common priority issues have been identified in the regional assessments, including the deterioration of ecosystems due to resource mismanagement and overexploitation; the increasing impact of urbanization and demographic change on quality of life; the growing impact of climate change; the challenges to providing equitable access to resources; the impact of lifestyles on resource consumption; and the need to improve resource productivity and foster a greater awareness of the value of natural capital. The regional assessments provide compelling analysis of the impact of these overarching trends on air quality, water quality and quantity, land-use changes and degradation as well as loss of biodiversity. Although some regions are seeing more severe impacts for specific environmental issues, a general message from all the regions is that impacts are being felt and policy responses are often insufficient to address these impacts.

B. The Global Gender and Environment Outlook

12. The *Global Gender and Environment Outlook*, to be launched before the second session of the United Nations Environment Assembly, is the first comprehensive, integrated assessment on gender and the environment. The key objective of the assessment is to inform decision makers about how environmental conditions affect the lives of women and men in different ways as a result of existing inequalities while underlining the interplay between human activities and the environment from a gender perspective. The analysis of the gender-environment nexus uses the Driver-Pressure-State-Impact-Response analytical framework. The assessment also aims at informing Governments about the potential roles of men, women, boys and girls as agents of change in environmental conservation and management and how they can be facilitated or hindered in playing such roles.

13. The *Global Gender and Environment Outlook* provides an overview of the gender-environment nexus, including trends, across six of the thematic areas of the Sustainable Development Goals: food security, water and sanitation, energy, oceans and fisheries, forests and other terrestrial ecosystems, and sustainable consumption and production. Analysis of those areas is systematically based on several cross-cutting issues, including human health, climate change, disaster and conflict management, and biodiversity. Other parts of the report present the big picture in terms of outlook and the key global trends conducive to change towards gender equality; a package of policy solutions and tools for better integrating gender perspectives into environment and development policies; and a range of policy options and solution-oriented responses, supported by best practices and inspiring case studies.

C. UNEP 2016 Frontiers Report: reporting on emerging issues

14. The UNEP 2016 Frontiers Report is a new annual report, intended to succeed the *UNEP Year Book* series, each volume of which will be based on a review of emerging environmental issues identified over the previous year as likely to have significant impacts on the environment, ecosystem health or human well-being. The UNEP 2016 Frontiers Report, to be published as an interactive e-book, covers six issues:

- (a) The compound effects of climate variability on toxin accumulation in crop-based food as a challenge to food and nutritional security;
- (b) Microplastics and synthetic fibres in the aquatic environment;
- (c) Zoonotic diseases and food-borne pathogens;
- (d) Loss of and damage to ecosystem services due to climate change;
- (e) Illegal trade in wildlife;
- (f) The hidden but influential role of the financial industry in achieving environmental sustainability.

15. A regional to global forecasting exercise, building on the regional assessments, is being planned for 2016–2017 in order to systematize the identification of areas requiring the strengthening of the science-policy interface.

D. Thematic assessments

1. Climate change

16. The results of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change continue to be used systematically in all relevant UNEP reports, including the *Adaptation Finance Gap Report* and the annual *Emissions Gap Report*.

17. The 2015 edition of the Report includes an assessment of submitted intended nationally determined contributions. UNEP, with Global Environment Facility (GEF) funding, supported 35 countries in developing their intended contributions. The intended contributions pathway examined in the report covers the period until 2030, and it is expected that more in-depth action will be required after the first five years to bring the global economy fully onto the cost-optimal pathway by 2030. After 2030, further rounds of national reductions will be required to remain on that pathway and keep global warming below 2°C until global emissions are eventually reduced to zero between 2050 and 2070.

18. The next edition of the *Adaptation Finance Gap Report*, to be released in March 2016, building on the 2014 edition, estimates that total international bilateral and multilateral financing for climate change adaptation in developing countries in 2014 had reached \$18.4 billion, resulting from annual increases of 8 to 9 per cent over the previous five years.

19. In 2015 and 2016, as part of joint work with the United Nations Development Programme, UNEP has been providing support to countries to develop their intended nationally determined contributions under the Paris Agreement. This work will be combined with capacity development under the country-level impacts of climate change programme and activities related to the Sustainable Development Goals.

2. Air quality including sand and dust storms

20. Regional air quality assessments are emerging as a major thematic priority in several regions. Assessment work related to the Global Platform on Air Quality and Health is ongoing, with UNEP working with United Nations agencies, the World Bank and Member States to assess the impacts of ambient outdoor air pollution. To support enhanced air pollutant monitoring and data analysis, UNEP has developed an affordable new air quality monitoring unit, costing approximately \$1,500, which can provide data for urban air pollution assessments.

21. As part of a project led by the Climate and Clean Air Coalition, UNEP is currently involved in producing assessments of short-lived climate pollutants for the Asia-Pacific and Latin American and Caribbean regions.

22. Following requests from several countries, and in support of General Assembly resolution 70/195 of 22 December 2015 on combating sand and dust storms, UNEP, in partnership with the World Meteorological Organization, the secretariat of the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in

Africa, and Member States, is currently leading a global assessment to be delivered to the United Nations Environment Assembly at its second session. The assessment will help to highlight the linkages between social, economic, environmental and health concerns and the need for an integrated approach to achieving a range of objectives. Synthesizing the latest knowledge on science and policy related to sand and dust storms, the assessment will apply that knowledge to identifying elements of a comprehensive management and prevention strategy for the global, regional and national levels. It will also serve to increase awareness among decision makers and stakeholders of the opportunities for managing sand and dust storms and encouraging partnerships for combined action to maximize impact.

3. Freshwater and marine resources

23. The Transboundary Waters Assessment Programme, coordinated by UNEP and funded by GEF, is working through a network of partners to complete the first global indicator-based assessment of five transboundary water system categories: aquifers and small island developing State groundwater systems, lakes and reservoirs, river basins, large marine ecosystems and the open ocean. UNEP is coordinating the work of the lead partners – the United Nations Educational, Scientific and Cultural Organization and its International Hydrological Programme and Intergovernmental Oceanographic Commission, the UNEP-DHI Partnership Centre on Water and Environment and the International Lake Environment Committee. Each lead partner engages a network of partners with thematic and geographic responsibilities, as well as a network of data- and information-rich institutions and organizations. The Programme provides a baseline assessment for identifying and evaluating changes in transboundary water systems caused by human activities and natural processes, as well as the consequences that they have on dependent human populations. It has formalized institutional partnerships for the current assessment, which may lead to subsequent assessments of international waters. The assessment results and transboundary water system profiles will be available through a data viewer from the Transboundary Waters Assessment Programme website,¹ as well as on the websites of partners and UNEP Live.

24. In response to the observed new and increasing cases of water pollution caused by human development and affecting water quality in surface and groundwater systems worldwide, UN-Water,² having conducted a pre-assessment study for a world water quality report in developing countries, has identified major data and knowledge gaps. A partnership has been formed, led by UNEP, to assess the challenges to global water quality; partners include the Global Environment Monitoring System/Water Programme, the Helmholtz Centre for Environmental Research (Germany) and the Centre for Environmental Systems Research (Germany), with contributions from a scientific panel of leading water scientists from developed and developing countries. The study entitled “A snapshot of the world’s water quality: towards a global assessment” will be launched at a science-policy forum to be held in Nairobi on 19 and 20 May 2016, and a draft report, including an analytical brief for United Nations Member State policymakers, will be launched at World Water Week 2016 in Stockholm (see the report of the Executive Director on resolution 1/9: Global Environment Monitoring System/Water Programme (GEMS/Water) (UNEP/EA.2/8).

25. The first United Nations World Ocean Assessment, including its summary, was approved by the Ad Hoc Working Group of the Whole on the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects, in September 2015. Ten themes were identified in the summary: implications for the ocean of climate change and related changes in the atmosphere; challenges for marine biota; food security and food safety; biodiversity hotspots as magnets for human activities; increased and conflicting demands for ocean space; increasing inputs of harmful material; cumulative impacts of human activities on biodiversity; uneven distribution of ocean benefits and disbenefits; integrated management of human activities; and the urgency of addressing threats to the ocean. UNEP has provided scientific and technical support, including financial resources, for capacity-building workshops through the Regional Seas Programme and the Ad Hoc Working Group of the Whole has agreed to a second phase of the process, to begin in 2016.³

¹ <http://www.geftwap.org>.

² UN-Water is the abbreviated name for the United Nations Inter-Agency Mechanism on all Freshwater Related Issues, Including Sanitation.

³ http://www.un.org/Depts/los/global_reporting/global_reporting.htm.

4. Biodiversity and ecosystem services

26. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, in its work programme for 2014–2018 (decision IPBES-3/1), is undertaking four regional and subregional assessments for Africa, the Americas, Asia and the Pacific, and Europe and Central Asia, together with one thematic assessment on land degradation and restoration. The findings of the GEO-6 regional assessments are being used by Platform experts in the development of those assessments.

27. Two further assessments, with summaries for policymakers, on pollinators, pollination and food production and on scenario analysis and modelling of biodiversity and ecosystem services were presented to the Platform's Plenary at its fourth meeting, in 2016, the first for approval and the second for acceptance. Those assessments, and the guidelines for the use of traditional and indigenous knowledge, will be referred to in the UNEP assessment guidelines and used in developing the GEO-6 assessments.

28. The Intergovernmental Platform is also scoping three future assessments, i.e., a global assessment of biodiversity and ecosystem services and thematic assessments of invasive alien species and of the sustainable use of biodiversity. In addition it is considering the option of an assessment of the open oceans region.

29. The Economics of Ecosystems and Biodiversity (TEEB) initiative is currently engaged in several thematic assessments. The "TEEB for Agriculture and Food Interim Report"⁴ was launched in December 2015 in Paris at the Global Landscapes Forum in the margins of the Conference of the Parties to the United Nations Framework Convention on Climate Change, and seeks to provide a comprehensive, evidence-based, economic assessment and evaluation of the "eco-agri-food" systems complex. The aim is to tackle the complexities of agriculture, economics, ecosystem services and biodiversity from the perspective of decision makers across the science-policy interface, especially in terms of policy implementation. The desired endpoint is informed policy change towards a more secure, equitable and sustainable environment along the entire food and agricultural production chain.

5. Chemicals, waste and natural resources

30. The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), in its 2013 report on the radiation exposure of various population groups following the Fukushima-Daiichi nuclear power plant accident in 2011, assessed the effects of the accident in terms of radiation-induced risks for human health and the environment. The population groups considered included residents of the Fukushima Prefecture and other prefectures in Japan and the workers, contractors and emergency personnel working on or around the site of the accident. The environmental assessment covered marine, freshwater and terrestrial ecosystems. To keep abreast of the new scientific information that has emerged since the launch of the report, the Committee has also published a white paper to guide its future programme of work entitled "Developments since the 2013 UNSCEAR report on the levels and effects of radiation exposure due to the nuclear accident following the great east-Japan earthquake and tsunami".

31. The UNEP *Global Waste Management Outlook* identifies inadequate waste management as a major public health, economic and environmental problem, with 7–10 billion tonnes of urban waste produced each year and 3 billion people worldwide lacking access to controlled waste disposal facilities. The assessment provides an integrated global solution to the waste problem, based on improving waste collection and disposal, preventing waste and maximizing reuse and recycling of resources, and a major policy shift away from the linear "take-make-use-waste" economy towards the circular "reduce-reuse-recycle" approach to the lifecycle of materials. An "African waste outlook" assessment is currently being planned.

32. The UNEP International Resource Panel has produced a number of assessments, including most recently one entitled *International Trade in Resources: a biophysical assessment*, and another on food systems and natural resources is forthcoming. Panel assessments focus on the science-policy interface and its members work closely with other scientific panels, including those of the Intergovernmental Panel on Climate Change, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, and the TEEB initiative, as well as the *Global Environment Outlook* and the *World Energy Assessment*. Panel outputs are being used directly in the global indicator framework of the 2030 Agenda for Sustainable Development.

⁴ <http://www.teebweb.org/agriculture-and-food/interim-report>.

E. Communicating key scientific findings to a wider audience

33. Current and future assessments will use an e-book format to facilitate greater interaction with the material through a more attractive presentation and links to a wider audience through social media platforms. E-book technology offers a three-dimensional platform, linking content to data sources, dynamic charts, graphs, maps and supporting literature, thus offering a richer scientific base and greater translation possibilities. The e-books will be accessible via UNEP Live and the UNEP website and will thus reach the broadest UNEP audience base. Traditional hard-copy materials will also be made available on a limited basis for reference purposes.

34. The Intergovernmental Panel on Climate Change and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services also have specific policies to facilitate and further enhance the consistent and coherent use of up-to-date digital technology for sharing and disseminating information and enhancing the readability of their products. The Intergovernmental Panel is exploring options for reaching all relevant stakeholders more effectively while maintaining its scientific rigour and objectivity.

F. Partnerships to support integrated environmental assessments and strengthen the science-policy interface

35. All current assessments – the sixth *Global Environment Outlook*, the *Global Gender and Environment Outlook*, the United Nations World Ocean Assessment and the assessments of the Intergovernmental Panel on Climate Change, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, the International Resource Panel and the Transboundary Water Assessment Programme – follow an integrated assessment approach with robust and extensive peer-reviewing processes and quality assurance standards and featuring a strong link between scientific findings and policy responses. They are typically structured around a systematic review of priority and emerging environmental issues; an assessment of the state of the environment based increasingly on up-to-date data, indicators and information on key trends; a review of policy responses and, where appropriate, an evaluation of their relative effectiveness and level of success; and a forecast of longer-term environmental trends, futures and outlooks.

36. Current and future assessments are – and will continue to be – supported by the improved data, indicators and metadata that UNEP is making available through UNEP Live, with links to the United Nations system data catalogue and Sustainable Development Goals Interface Ontology, as well as to national and international open-data platforms. The overall goal is to ensure that data are timely and updated and provide a more continuous approach to assessments.

37. The UNEP knowledge management strategy includes a move to open access for all citations in its reports, thus increasing transparency and strengthening and extending the evidence base for all users, especially policymakers. Partnerships are being developed with leading scientific publishers to achieve this.

38. Partnerships are being strengthened through the network of collaborating centres and thematic centres of excellence, such as the Global and Regional Integrated Data (GRID) centres, with multilateral environmental agreement secretariats and regional bodies, especially where specific scientific or policy expertise is provided, and coordinating activities are being put in place to maximize synergies. UNEP reports provide multilateral environmental agreements with support for evidence-based decision-making; the UNEP *Emissions Gap Reports* and the *Fifth Assessment Report* of the Intergovernmental Panel on Climate Change, for example, are used at sessions of the Conference of the Parties to the United Nations Framework Convention on Climate Change.

39. An example of a key partnership with a focus on data and information for effective decision-making towards sustainable development is the Eye on Earth Alliance, of which UNEP is a member. In October 2015, the second Eye on Earth Summit was held in Abu Dhabi. The Summit brought together policymakers, scientists, researchers, technology developers, advocacy groups and non-governmental organizations, and representatives of international organizations. The Summit generated renewed interest in addressing the challenge of identifying and delivering the environmental and associated socioeconomic data needed to track the progress of the Sustainable Development Goals, and sharing knowledge among stakeholders engaged in the implementation of the 2030 Agenda for Sustainable Development.

40. Scientific advice is in great demand but is also often contested. From climate change to cyber-security, from poverty to pandemics and from food technologies to hydraulic fracturing, the questions being asked of scientists, engineers and other experts by policymakers, the media and the wider public continue to multiply and increase in complexity. At the same time, the authority and

legitimacy of experts is under increasing scrutiny, particularly in areas that cause intense debate, such as climate change, equitable access to resources and energy choices. The International Network for Government Science Advice was recently established, with a membership that includes the UNEP Chief Scientist and scientific advisors from more than 70 countries. The aim of the network is to strengthen the science-policy interface across Governments worldwide, and it is currently undertaking assessments of the interface across institutional settings in various domains, including the environment.

III. Analysis of gaps in environmental data, information and assessments

41. Preparation of a gap analysis report is currently under way, with the evaluation of data gap issues being addressed in the regional and global assessments underpinning GEO-6. An inventory of data gaps is also being developed within the context of the work that UNEP is undertaking on data availability in relation to the Sustainable Development Goal indicators.

42. UNEP is also undertaking extensive work on improving metadata, definitions and other methodological work, including on using big data for monitoring the environment, measuring the environmental dimension of the Sustainable Development Goals and developing an extensive system of Sustainable Development Goal ontologies. A Sustainable Development Goals Interface Ontology was recently launched on UNEP Live as part of the response of the United Nations Secretary-General's Chief Executives Board for Coordination to the data revolution.

43. Among the various advisory groups established under the GEO-6 process, the Assessment Methodologies, Data and Information Working Group, whose members include some of the most knowledgeable experts in the field, has formed task forces to examine environmental data and information gaps, as well as innovative methods for improving environmental assessments. Inputs from the group will facilitate the development of a set of revised international integrated assessment guidelines and support the development of the data and information gap analysis report.

44. UNEP will provide an overview of the environmental dimension of monitoring the Sustainable Development Goals to the United Nations Environment Assembly at its second session.

IV. Progress on globally agreed goals and recommendations on policy instruments for a strengthened science-policy interface

45. The global, regional and thematic assessment processes include efforts to identify success stories of countries in strengthening the science-policy interface. Evidence is hard to gather owing to difficulties of attribution, but recommendations and ideas on global and international policy instruments are now being developed based on experience at the national and regional levels.

A. Measuring progress in achieving internationally agreed environmental goals and targets

46. UNEP, through a dedicated area of UNEP Live, continues to monitor progress in meeting the internationally agreed environmental goals of the multilateral environmental agreements and to monitor participation in those agreements through the United Nations Information Platform on Multilateral Environmental Agreements (InforMEA).⁵

47. The current regional and global assessments for the sixth *Global Environment Outlook* are reviewing progress in national policymaking to achieve the environmental goals and targets at the global and regional levels. The ongoing global and thematic assessments, including those on air quality, the emissions gap and water quality, are also beginning to extend their scope to analysis of progress towards the Sustainable Development Goals and targets.

48. As part of the support of the United Nations Statistical Commission for the 2030 Agenda for Sustainable Development and the work of the Inter-agency and Expert Group on the Sustainable Development Goal Indicators, UNEP and the wider United Nations system are providing technical inputs on indicators to measure progress with regard to the environmental dimension. To that end, UNEP is working on the metadata requirements and data flows together with Member State national statistical offices and other United Nations bodies.

⁵ www.informea.org/.

49. On climate change in particular, existing policies and the intended nationally determined contributions submitted in advance of the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change could, if fully implemented, cut as much as 11 Gt CO₂-equivalent from projected emissions by 2030. However, this is approximately half of the total required to reach the global emissions level of 42 Gt CO₂-equivalent by 2030, which is consistent with a more than 66 per cent chance of meeting the target of limiting global temperature rise to 2°C by 2100. The Paris Agreement provides a framework for reviewing and enhancing commitments in order to raise the level of ambition and contribute to meeting the overall goal.

B. Recommendations

50. The availability of the six GEO-6 regional assessments will offer a unique opportunity to strengthen the science-policy interface from a regional perspective. The six assessments will be regularized in line with existing state-of-the-environment assessments, such as the *European environment – state and outlook assessments* and the *Africa Environment Outlook* and *Latin America and the Caribbean Environment Outlook* series. In some instances, the regional assessments will serve to meet the reporting requirements of various regional ministerial environment forums such as the pan-European “Environment for Europe” ministerial conferences. In the long term, a streamlined process of regular regional reporting on the environment can serve as a policymaking mechanism within the context of the Sustainable Development Goals and the reporting and review cycle for the Global Sustainable Development Report.

51. In addition, many regional and global assessment findings will have relevance at the national level given the largely transboundary nature of many environmental challenges. Countries will increasingly be able to use those findings to inform, shape and update their policies and strategies to address the environmental dimension of sustainable development.

52. Based on a preliminary review of the existing draft regional assessments for GEO-6, it is recommended that, in order to address emerging environmental problems, all regions will need a wide range of scientifically sound and actionable solutions, including:

- (a) Environmental institutional reform (governance, coordination, capacity and funding);
- (b) Stronger compliance across a range of regulatory frameworks;
- (c) Increased investment in data and statistics;
- (d) Use of economic instruments to integrate the environment with other policy areas;
- (e) Increased involvement of the private sector and civil society in environmental management and sustainable production and consumption;
- (f) Enhanced regional cooperation to manage transboundary issues, especially those related to major ecosystems and major environmental challenges such as air and water pollution and sand and dust storms.

V. Long-term development and use of UNEP Live

53. UNEP Live is a web-based knowledge management system that provides contextualized data, information and scientific knowledge to keep the environment under review, tools for strengthening national capacity in state-of-the-environment reporting and assessments, and opportunities for collaborative co-production of knowledge and research by practitioners and policymakers in support of robust, evidence-based, assessment and policy analysis.

54. The UNEP Live indicator reporting information system is used in parallel to assimilate national, regional and global reporting-related data and statistics, including through the Sustainable Development Goals global indicator framework. That role will be strengthened as more content on indicator relationships, ontologies and web intelligence becomes available through the UNEP Live Sustainable Development Goals Portal from national ministries and statistical offices and the international statistics community.

55. The indicator reporting information system also facilitates data-sharing among national data custodians, providing a tool for simplifying the compilation and computation of indicators and a “scoreboard” for reporting on and informing policy-making processes.

56. The first 18 months have been devoted to the development of the platform, tools and the wider UNEP Live knowledge management system and to establishing indicators based on the available data from global, regional and national sources in cooperation with Governments, institutions and other data providers. This has resulted in:

- (a) A UNEP digital repository of knowledge assets, with live news updates and links to the knowledge assets of United Nations system digital repositories;
- (b) Some 418 maps connecting long-term environmental monitoring and near-real-time data;
- (c) A total of 182 global data flows, in partnership with 22 institutions, and 2,183 national flows related to the major environmental themes and key social and economic indicators from 190 countries;
- (d) Nine communities of practice with a total of 1,547 registered members;
- (e) A UNEP Live Sustainable Development Goals Portal that links indicators and national and global data to the Interface Ontology;
- (f) A multilingual web intelligence tool for analysing unstructured information from social media and the scientific and business communities worldwide, with entity mapping and analysis of stakeholder perceptions of key environmental issues;
- (g) Topical issue pages accessed by theme, e.g., “emissions-impacts-climate change”, “air quality-health-climate change” and “UNEP project presence”;
- (h) Development of the UNEP Live indicator reporting information system to enable countries to collect, analyse and publish data in order to simplify and streamline reporting processes at the national, regional and – through multilateral environmental agreements – global levels. Twenty-two country visits have been made to date, at the invitation of Governments, to demonstrate the functionality of the system and the benefits of open access data, and Samoa has become the first country to sign a memorandum of understanding with UNEP to facilitate the technology transfer;
- (i) A UNEP Live citizen science portal for citizen science environmental data initiatives and visualization;
- (j) A test bench for sensor-web enabled environmental monitoring, the first product being the UNEP Air Quality Monitoring Unit, which can be networked to provide accurate spatial statistics on exposure to ambient particulate matter and gases in urban and rural areas.

57. With website visits and page views having increased 198 and 190 per cent in 2015 over 2014, the plan for the further development of UNEP Live in the 2016–2017 biennium is:

- (a) To continue to populate UNEP Live with new and relevant content, linked to UNEP and United Nations resources, and to enable countries and other data providers to share data and knowledge;
- (b) To assist countries in streamlining their data flows and indicators for use at the national and international levels, such as in state-of-the-environment reporting under multilateral environmental agreements and progress reporting on the Sustainable Development Goals;
- (c) To facilitate reporting through the use of national reporting system technology transferred to countries by UNEP, on request and at no cost, and through continued support for open data access to enable countries to share national data, statistics and information;
- (d) To further develop the UNEP Live Sustainable Development Goals Portal by completing the definitions for the Interface Ontology and linking it to the United Nations system data catalogue;
- (e) To intensify United Nations inter-agency initiatives and external partnerships to contribute scientifically credible and policy-relevant environmental data and indicators to UNEP assessment processes;
- (f) To continue to share data and knowledge from recognized groups representing traditional and indigenous peoples and to develop tools and guidelines for their use in assessments in collaboration with the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services;
- (g) To facilitate access to relevant citizen science initiatives, including Eye on Earth special initiatives undertaken through the UNEP Live citizen science portal;
- (h) To ensure extensive links to the GEF portfolio and the work of the GEF Scientific and Technical Advisory Panel under common knowledge management systems;
- (i) To publish UNEP knowledge management and web intelligence tools in all six United Nations languages;

(j) To continue to support ongoing collaboration with UNEP regional offices to ensure that UNEP Live is a region-wide service that facilitates national environmental data flows and technology transfer for the national reporting system – and links to equivalent technologies – to support national state-of-the-environment and Sustainable Development Goal reporting;

(k) To convene Regional Environment Information Network conferences to support capacity-building for national, regional and global reporting, including on the Sustainable Development Goals.
