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Policy issues: state of the environment

State of the environment and contribution of the United Nations Environment Programme to addressing substantive environmental challenges

Addendum

Report by the Executive Director

Overview of the international environmental assessment landscape and options for a future global assessment on environmental change

Summary

The present report has been prepared in response to decision SS.X/5 of 22 February 2008, paragraph 7 (a), which called upon the Executive Director of the United Nations Environment Programme to present to the Governing Council/Global Ministerial Environment Forum at its twenty-fifth session an overview of the international environmental assessment landscape, identifying possible gaps and duplications, in close cooperation with multilateral environmental agreements and other United Nations entities. Furthermore, in response to paragraph 7 (b) it presents options for the possible development of a scientifically credible and policy-relevant global assessment of environmental change and its implication for development, including a cost analysis and an indicative benefit analysis for each option.

The present report refers to the main findings of studies of the environmental assessment landscape at the national, regional and global levels contained in two documents (UNEP/GC25/INF/12 and Add.1) and findings from an initial impact review of the fourth *Global Environment Outlook: Environment For Development (GEO-4)* report contained in document UNEP/GC.25/INF/13.

The present report outlines a number of policy-relevant findings, challenges and opportunities for bringing additional coherence to the international assessment landscape. It also discusses guiding principles for a future global environmental assessment and presents a preferred option for a future global assessment of environmental change for consideration by the Council/Forum.

* UNEP/GC.25/1.

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I. Background: Mapping the international assessment landscape

A. Mapping the international environmental assessment landscape and the Science Initiative

1. One of the main responsibilities of the United Nations Environment Programme (UNEP) as outlined in General Assembly resolution 2997 (XXVII) of 15 December 1972, is to keep under review the world environmental situation and ensure that emerging environmental problems of wide international significance are prioritized and receive appropriate and adequate consideration by Governments. In response to decision 22/1 I A of the Governing Council/Global Ministerial Environment Forum (hereinafter the Council/Forum), a multi-stakeholder consultative process was initiated to identify gaps and needs in the current assessment structure, together with the means to address them. The consultative process, also referred to as the "Science Initiative", ¹ has continued to engage Governments, intergovernmental and non-governmental organizations and scientific institutions on the ways and means to strengthen the scientific base of UNEP.

2. One of the recommendations arising out of the consultative process was that UNEP should map the international assessment landscape from three perspectives: coverage, effectiveness and impacts. "Coverage" refers to the geographical scope of assessments under way and includes the thematic focus, goal, mandate and institutions and partners involved. "Effectiveness" takes up the issues of salience, credibility and legitimacy,² which are widely regarded as essential properties of a successful assessment process. "Impact" seeks to determine the influence of assessments on environmental policymaking and implementation, human behaviour and the state of the environment.

3. The consultative process also gave rise to the suggestion that UNEP could provide an umbrella for coordination by taking periodic stock of current environmental assessment activities, while avoiding duplicating or interfering with existing mechanisms where those were working well. At its twenty-third session, the Council/Forum adopted decision 23/6, which called for strengthening of institutional capacities for participating in assessment processes at all levels and for engaging in networking, data collection and data sharing. Participants at the tenth special session of the Council/Forum revisited the issue of bringing greater coherence to the international environmental assessment landscape and called upon the Executive Director to present a report to the Council/Forum at its twenty-fifth session.

B. Scope of the exercise of mapping the assessment landscape

4. The synthesis of the international assessment landscape presented here is based on information accumulated from the mapping of the assessment landscape exercise that began in 2005. The mapping exercise entailed building a comprehensive inventory of various framework assessment processes and their related outputs.³ The aim was to provide a baseline overview, since 1992, of the thematic and geographic coverage and scope of the assessment at all levels (global, regional, subregional and national);⁴ and identify the gaps in information to assist in setting assessment priorities.

5. The international assessment landscape and its assessment processes are illustrated generically in the conceptual model shown in figure 1. In this model, a lead institution (or institutions) is responsible for driving and managing an overall assessment process, which in turn comprises one or more subprocesses under which individual environmental assessments are undertaken, ultimately producing published outputs. Assessment outputs are usually a main report and related products, such as executive summaries, technical studies, data compendiums and policy-relevant findings. For example, the Global International Waters Assessment was designed as a global assessment process comprising 66 subprocesses covering the world's major water bodies.

6. Distinct mandates provide legitimacy for various assessments. At the country level, the mandates are usually embedded in national environmental legislation. At the supranational level, mandates originate from decisions of various governing bodies and international forums such as

¹ http://www.unep.org/scienceinitiative.

^{2 &}quot;Salience" refers to an assessment's ability to communicate with the users whose decisions it seeks to inform and whether the information is perceived as relevant; "credibility" addresses the technical quality of information, as perceived by the relevant scientific or expert communities; "legitimacy" concerns the fairness and impartiality of an assessment process, as judged by its users and stakeholders.

³ The exercise excluded strategic environmental assessment, integrated policy assessment and environmental impact assessment.

⁴ In some countries subnational assessment processes were examined.

regional ministerial forums. Such mandates may govern overarching assessment processes while others apply at the subprocess level or even at the level of an individual assessment.



Figure 1: Conceptual model of the international assessment landscape

7. This conceptual model also provided the basis for the design of the web-based information system known as the prototype environmental assessment and reporting landscape,⁵ which aims to provide Governments and other stakeholders with a comprehensive overview of the international assessment landscape via the internet. Over 60 global, regional and subregional assessment processes have been mapped, together with national assessment processes in approximately 160 countries and territories, and over 2,000 full texts of assessment reports are available online.

II. Summary of the national environmental assessment landscape

8. Keeping the environmental situation under review through regular assessment and reporting supports the attainment of national development goals and priorities. In many countries, mandates governing regular assessment and reporting originate from primary environmental management legislation. In the 15 years since the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, environmental assessment and reporting as called for in Agenda 21 has become a well-established process at the national level. The present section provides a synthesis of the findings resulting from the detailed overview of the national environmental assessment landscape presented in document UNEP/GC.25/INF/12/Add.1.

A. Coverage: State of national reporting

9. The study, which covered 196 countries and territories, found broad differences in the national environmental assessment and reporting approaches applied in response to national needs and capacities as summarized in figure 2. Of the 196 countries and territories examined, 161 (or 82 per cent) are involved in state of the environment reporting, meaning that they have produced at least one such report since 1992 or have a first report in process (as of November 2008). Of the 196 countries and territories, 35 (18 per cent) demonstrated no evidence of state of the environment reporting. Fifty (26 per cent) now publish reports at regular intervals, ranging from annual reports to one report every four or five years. Eleven countries and territories (6 per cent) that used to prepare reports regularly no longer do so for reasons ranging from political opposition to civil unrest.

10. Many countries and territories began with an extremely lengthy state of the environment report, but subsequently realized that they could not repeat that effort every year. In addition, many people lacked the time to read so much text. Reports that originally were as long as 500–700 pages are now generally limited to about 100 pages. Some countries produce annual thematic reports going into depth on just one dimension (such as biodiversity, water or energy) between comprehensive reports. There has also been a broadening of outputs from the assessment process, such as a detailed technical report for specialists, a statistical compilation, an executive summary for decision makers, a pocket version for the public, a version for young people and an interactive website regularly updated between reports. New Zealand, for example, encourages its indigenous Maori community to produce its own reports within its own cultural context and value system, and in Spain the various regions issue their own reports in their respective languages.

5 www.unep.org/pearl.



Figure 2: Continuity of national environmental assessment and reporting in 196 countries and territories

11. An important factor that appears to determine the nature of state of the environment reporting is the size of a country or territory and its population. In Niue, whose 1,500 inhabitants can see and experience their whole national environment daily, there is less need to read about it. Instead of producing a printed report, Belize, for instance, adopted the creative approach of organizing periodic national symposia on the state of the environment, beginning in 1993, with the Government offering scholarships to encourage wide participation from civil society. Large countries tend to move towards reporting at the subnational level.

12. A multilevel assessment and reporting process is necessary to support the various levels of decision-making. National policies and strategies provide an integrated approach to the entire national territory, but in large countries with geographic diversity and many environmental or climatic situations, the functional units for environmental management may be at subnational political scales or geographic subdivisions. Environmental reporting is most effective if scaled to the right functional unit of decision-making. A number of countries (such as Brazil, China, India, Norway, South Africa and Uganda) have decentralized assessment and reporting responsibilities to lower levels of Government or adopted a nested approach whereby a national report builds on reports prepared at the provincial, district or municipal levels. The UNEP Global Environment Outlook for Cities reports target the important municipal scale of environmental management and aim to provide local governments, scientists, policymakers and the general public in the region with reliable and up-to-date information about their cities.

13. The overview reflects a rich diversity in national approaches to environmental assessment and reporting responding to varying national needs and capacities. There is no one ideal way to report on the environment, but many criteria can be considered in developing a relevant national approach. Some of the lessons learned are highlighted here; more detail with case studies is available in document UNEP/GC.25/INF/12/Add.1.

B. Effectiveness of national assessments: Salience, credibility and legitimacy

14. Today's integrated environmental assessments are both broader and more policy-relevant than the previous state of the environment reports. They also endeavour to provide an outlook on the future through scenarios that explore the consequences of possible policy options. A key lesson from the experience accumulated is the need to go beyond simply reporting on the state of the physical and biological environment to include the social and economic dimensions that are equally critical to sustainability and human well-being.

15. Environmental parameters tend to change only gradually, rendering it difficult to document change on an annual basis. Many countries now prepare a comprehensive state of the environment report on a four- or five-year time frame linked to the policy cycle. Ideally, a scientific report on the state of the environment is accompanied or followed by a strategy document for sustainable development, an action plan and, ultimately, an evaluation or audit examining the effectiveness of the actions taken.

16. In many countries, the mandate for environmental assessment and reporting originates from the primary environmental management legislation. There is significant variation by country in the specific references to the types of environmental reporting required and also the frequency of reporting, which ranges from six months to 10 years.

17. Periodic scientific review needs to be supplemented by reporting that helps to maintain persistent and emerging issues of environment and sustainability on the agenda. This requires more concise and targeted outputs. The same scientific observation and assessment process should support both internal and external reporting, and building this coherent national capacity to gather environmental data, analyse it and provide relevant scientific interpretations for policymakers is an essential part of development. To be effective, this cannot be only an expert process. It needs to be both science-based and participative, responding to policy and management needs. One of the lessons learned from UNEP experience in environmental assessment activities gave decision makers the confidence to consult their own experts with detailed local knowledge, as opposed to foreign experts. The resulting working relationships were much more effective in providing a scientific basis for decision-making than any individual report.

18. Indicators have become increasingly important to reporting, both in the quality of their scientific conception and the data behind them, and in their use to summarize quantities of information in easily understandable form. Many have adopted a full set of some 50 indicators of sustainable development to be reported regularly, of which 10 are used as headline indicators for rapid communication, expressed as traffic lights or simple graphic symbols. State-of-the-environment websites have evolved into interactive data sources where information is regularly updated between reports.

C. Impact of national assessments

19. Traditional state of environment reports or integrated assessments provide scientific support to Governments in their internal environmental protection and management and sustainable development functions, responding to the need for public awareness and access to environmental information that is so important for effective implementation.

20. Another type of reporting with an external focus helps Governments to influence international decision-making processes, for example through country reports to intergovernmental conferences, in addition to reporting on its obligations under multilateral environmental agreements. For developing countries, such external reporting is also frequently intended to justify or attract donor assistance by documenting environmental problems, and bilateral and multilateral donors may support or even undertake national environmental assessments (with or without much national participation) as a guide to their funding decisions. External reports may have less scientific content on the state of the environment, and more on national environmental policy, legislation, and management action, and they only indirectly influence real action to protect and manage the environment. Little attention has been paid to striking the appropriate balance between the two types of reporting and many national examples suggest that the latter is gradually replacing the former.

21. Many Governments (and other large institutions) suffer from bureaucratic

compartmentalization. Environment ministries in particular are often less influential than, for example, ministries of finance, development and trade. For integrated environmental or sustainable development reporting, the need to share information, decide on relevant indicators and draft consensus text helps to break down isolation, compartmentalization and even rivalry between ministries and to create working relationships that are healthy for good governance. The involvement of scientific experts from academic institutions and representatives of civil society broadens this benefit even further. It could be said that the process of preparing such reports is often as important as the final product.

III. Summary of the regional and global environmental assessment landscape

22. The present section provides a synthesis of the findings resulting from the detailed overview of the regional and global environmental assessment landscape presented in document UNEP/GC.25/INF/12. Over 60 global, regional and subregional assessment processes have been examined, covering various thematic areas and levels of integration. For the global processes, aspects of the process relevant to the influence of the assessment have been analysed. Examples of best practice for global assessments are also relevant for the regional and subregional levels.

A. Coverage: State of regional and global reporting

23. Numerous regional and subregional assessments exist. First, regional assessments are often carried out within global assessment processes, including regional chapters in *GEO4* and the reports of the Intergovernmental Panel on Climate Change. The Millennium Ecosystem Assessment included 18 sub-global assessments that had been approved by the Assessment itself, together with an additional set with an associated status. The Global International Waters Assessment considered nine major regions and 66 subregions, with its assessment reports published for 31 subregions. The International Assessment of Agricultural Knowledge, Science and Technology for Development had five sub-global assessments. For the marine environment, the Global and Regional Marine Assessment Database lists more than 70 regional assessments for Africa, Latin America and the Caribbean, North America and Asia and the Pacific, although only Africa and Latin America and the Caribbean have carried out a regular process of assessments.

24. In Africa, in addition to the Africa Environment Outlook process there have been seven major assessments covering forests, water, chemical pollution and regional vulnerability to environmental change. In the Asia and Pacific region, there are 10 other major assessment processes, including subregional environment outlooks but also assessments on specific issues such as forests, air pollution and post-disaster environmental state. In the Latin American and Caribbean region, in addition to the Global Environment Outlook assessments described earlier and subregional Global Environment Outlook assessments, the remaining assessments include two regional environmental outlooks, one assessment on the issue of climate change, assessments for young people, an assessment on health, one on international waters and two assessments by the Chemicals Branch of the UNEP Division of Technology, Industry and Economics chemicals programme. For West Asia only a small number of assessment activities are reported and there is no integrated environmental assessment for the region, although one is planned for 2009. Two of the assessments are concerned with water, the major environmental issue of the region, while the third assessment was prepared for the World Summit on Sustainable Development in 2002. In addition to the Global Environment Outlook report North America's Environment, published in 2002, the North America region has assessments on children's health and the environment and an assessment of persistent toxic substances. Assessments are carried out under the auspices of the Commission for Environmental Cooperation. For Europe, the wide range of assessments produced by the European Environment Agency are complemented by others produced by the Food and Agriculture Organization of the United Nations, the Organization for Security and Cooperation in Europe, the United Nations Economic Commission for Europe, the World Health Organization and UNEP. Only one assessment (on persistent toxic substances) is reported for the Antarctic, however there are regional assessments of the marine areas surrounding this continent. The assessments in the Arctic cover the issues of toxic substances, pollution and climate change, together with the marine assessments for the region. The 24 regional studies funded under the assessments of impacts and adaptations to climate change project include evaluation of vulnerabilities and adaptation strategies, use of observed impacts of recent climate variability to understand present vulnerabilities. use of social and economic scenarios to investigate multiple and interacting future stresses and engagement of stakeholders.

25. For the marine environment, the Assessment group of experts is still completing its analysis of the assessment landscape. This process suggests that, while assessment capabilities are strong in many regions, there is a clear need for continued efforts to develop greater expertise around the globe in the technical aspects of marine environmental assessment work. In addition, there are three major areas that require immediate, concerted and continued attention: ensuring that assessment processes are well designed, focused and conducted to the highest standards; improving data access and interoperability so that assessment analyses can be extended and integrated with and across regions and developing integrated marine ecosystem assessments that can inform on the state of systems rather than simply individual sectors.

26. At the global level there is considerable overlap concerning the issues that are covered in assessments. This is not surprising given the interlinkages in the Earth system (see *GEO4*, chapter 8). Some assessment processes, such as the Intergovernmental Panel on Climate Change, the stratospheric ozone assessments, the *World Water Development Report* or the *State of the World Fisheries and Aquaculture* publication cover one issue in particular, although even here there are acknowledged linkages between issues. Other assessments, such as the Global Environment Outlook and the Environment Outlook, examine a range of issues and the links between them. The most visible overlap between global assessments is in the area of biodiversity, where there are several current assessment processes and some recently completed processes all covering the topic as a whole or aspects of it (for example, forests and marine ecosystems).

27. *GEO4*, with its central theme "environment for development", analysed how humankind depends on the environment. It covers all international environmental issues, regional analyses and the design of environmental policy. Findings from the initial impact review of *GEO4* (UNEP/GC.25/INF/13) indicate that although *GEO4* compares favourably with other global assessments, its relevance is affected by the crowded assessment landscape and a perceived lack of clear objectives and target audience. Most of the respondents in the review found that *GEO4* was either more or less the same (37 per cent) or better (26 per cent) than other assessment reports in terms of the value that it added to their work.

B. Effectiveness of regional and global environmental assessments: Salience, credibility and legitimacy

28. The main gaps in the regional and global assessment process are less in the coverage and more in the awareness of the importance of designing a salient, credible and legitimate process to ensure that the assessment is influential.

29. One of the initial activities in an assessment is the definition of its scope, which has important implications for the assessment's credibility and salience. One aspect of scope is the integration of social and economic aspects into assessments. Experience in this regard is extremely mixed. The use of the drivers-pressures-state-impacts-response framework (as used, for example, in the Global Environment Outlook process) is the most common approach to integrating social and economic aspects, although other related approaches have also been successful (for example, the causal chain analysis in the Global International Waters Assessment). Important progress has been made in linking environmental change and changes in ecosystem services to human well-being (in the Millennium Ecosystem Assessment and *GEO4*). The recently completed assessments of impacts and adaptations to climate change and *GEO4* have also advanced the use of vulnerability assessment as a way to consider the impacts of multiple stresses, the differential exposure of individuals and societal groups and the importance of adaptive capacity. An outlook component of an assessment enables inclusion of social and economic considerations and comparison of possible future pathways.

30. Careful consideration of which stakeholders should be involved and means of involving them is fundamentally important in planning an assessment, since it affects its credibility, relevance and legitimacy. If participation is not well thought out, this may undermine its goals and potential value. Global assessment processes have evolved to include a broader range of stakeholders throughout the process, which increases their policy relevance, in particular.

31. For the design of the science-policy interface in an assessment process, several factors are important: regular dialogue between policymakers and those leading an assessment throughout the process; explicit terms of reference and policy-relevant questions; guidance for policymakers to set priorities; and a clear understanding of which users, managers and specialized decision-making authorities will be affected by an assessment. The design of the science-policy interface varies quite widely in assessment processes. In intergovernmental processes (such as the Intergovernmental Panel on Climate Change or the stratospheric ozone assessment) the interface is strictly defined. In other processes (such as the Millennium Ecosystem Assessment) it is more flexible. The model developed by the Panel, for example, provides for effective knowledge transfer.

32. Effective communication is an essential component of an assessment process, from the design stage through to presentation of results. A clear description of how the assessment was carried out and who was involved supports perceptions of credibility and legitimacy. Informative products targeted to each identified audience enhance the assessment's relevance and credibility.

33. Assuring an adequate funding base for an assessment process is essential. Without funding, the process loses credibility through the inability to engage credible experts and loses relevance and legitimacy through the inability to fund consultations with all relevant societal stakeholders throughout the process at the global and, importantly, subglobal levels. Information on funding is often anecdotal and not easily available. The evaluation of the Global International Waters Assessment process illustrates, however, the funding challenge of most assessment processes: scientific experts are largely engaged on a voluntary basis, which certainly enhances the scientific credibility of the process but is generally regarded as an unsustainable long-term solution.

C. Impact of regional and global environmental assessments

34. Given the wide range of assessment processes that have been carried out or are under way, the major question that remains is whether these processes are influencing decision-making and policy implementation. It is often extremely difficult to identify clearly the influence of particular assessments on policymaking. For some issues, such as stratospheric ozone and long-range transport of air pollution,

there are success stories, where the assessment processes have led to action. For other issues, however, there is less evidence that the assessment is influential. This points to the urgent need to pay more attention to the design and documentation of assessment processes to enhance their credibility, relevance and legitimacy, including explicit evaluation of processes and learning from experience. Processes are required that are participatory in all stages, iterative and flexible, and provide a strong basis for strategic decisions through the development of networks of stakeholders with a common understanding of the issue at stake and the pool of possible solutions.

35. By definition an assessment is carried out at the interface between science and policy (or between "knowledge" and "action"). Since a primary role of an assessment is to inform policy decisions, it is important to take into account policymakers' needs. In most assessment processes, especially those linked directly to decision-making bodies, there is "boundary negotiation" between the science and policy communities. For assessments that are not directly linked to "client" decision-making processes, it is even more important to identify the key policies and the relevant decision-making bodies that the assessment is intended to influence, together with the priority accorded to the issues under consideration by the policy community and the general public. In addition to a direct link with decision-making to enhance policy relevance, regular assessment supports adaptive management responsive to new scientific knowledge and other developments – the makings of an iterative assessment processe.

36. Global assessments are important but the linkage between "knowledge" and "action" might be easier to establish at the regional level, where regional assessments could play a significant role. At present only two regions appear to be carrying out iterative integrated environmental assessment processes. In Africa, for example, the Africa Environment Outlook process has also provided information and underpinned significant subregional processes in the region. Its first report provided the baseline information for the development of the Environment Initiative of the New Partnership for Africa's Development. Complementary products, such as *Africa: Atlas of Our Changing Environment*, have catalyzed action on ecosystem restoration in some countries, for example Lake Faguibine in Mali, Gishwati forest in Rwanda and the Tana River delta in Kenya.

IV. Communication and access to assessment reports

37. Since the goal of any assessment process is to influence policy and action, effective communication of results is critically important. Much has been learned about the best ways to deliver the assessment results and most significant messages to target audiences.

A. Communication format

38. Modern information technologies have allowed much more flexibility in formats. The first innovation, pioneered by the UNEP Global Resource Information Database office in Arendal, Norway, was for web-based reports, but these were limited in the amount of information that they could convey. The development of electronic document formats, such as the portable document format, more commonly known as "pdf", make it possible to combine internet availability with more sophisticated formats. Masses of text with data tables and graphs have given way to short paragraphs with indicators, colourful graphics and photos in attractive layouts that are easily distributed as electronic files.

39. Many of the assessment websites include a considerable amount of other information in addition to the assessment reports, including media releases and video material. For the ozone assessments it has become customary to add a set of questions and answers to the executive summary, mainly for non-expert readers. The availability of the underlying data and metadata is much less widespread. For the *GEO4* process, the Global Environment Outlook data portal is a source of data used in the assessment. The third Global Biodiversity Outlook process also plans to use a web-based data portal and the World Resources Institute maintains a data portal backing up the *World Resources Report*.

B. Access to environmental assessment reports

40. The overview study found a significant problem in gaining access to state of the environment information. While information technology now renders this easy, few countries maintain a website storing a complete collection of their state of environment reports, with often only the most recent reports available. In the case of printed reports, distribution is the limiting factor for reasons of cost. Electronic media are, however, particularly fragile, given that older information may be lost when websites are redesigned or abandoned. Past reports do, of course, provide an important baseline from which to determine significant trends over time.

41. Maintaining a record of the data and analysis used in an assessment is an essential foundation for future assessments and for the ability to evaluate changing conditions. It is a vital aspect of an assessment's credibility, especially for scientists who wish to verify the basis of assessment findings. It is important for data preservation and access to be considered at the outset of an assessment and not as an afterthought.

42. Recent research points to the importance of explicitly providing for a stage of evaluation in an assessment process, so that lessons learned can be integrated into any new iteration. This post-assessment evaluation must consider how any subsequent assessment will include, among other things, new aspects of the issue or issues under consideration (objectives, scope) including progress in scientific understanding and acquisition of new data or information that could elucidate earlier findings and recommendations; new developments in analytical tools and methods that would improve the assessment; and the state of response measures and impediments to their implementation. The evaluation must also review the value and timeliness of assessment products and how they were used by relevant decision makers.

43. It is most important for assessment processes to be able to learn from the experience of others. This requires the processes to documented and stored in a central repository. The prototype environmental assessment and reporting landscape web-based information system developed by UNEP, in addition to the Global and Regional Marine Assessment Database developed by the World Conservation Monitoring Centre, provide a basis for such documentation but feeding those databases with information requires significant work. That assessment processes themselves often do not document key process elements makes this work even more time-consuming.

V. Towards a more coherent environmental assessment landscape

A. Challenges and opportunities

44. At the national level, the increasing demand for external reporting can detract from, or entirely replace, the internal reporting that directly bolsters good environmental management. Much external reporting is donor-supported, and while this may build human capacity, it is often not sustainable if donor support should cease. There are even examples where donor-driven reports have replaced indigenous national reports and created dependence. If the donor relies largely on outside experts, or provides a country with regular national environmental reports, this can interfere with the development of a participative national process, with the loss of the collateral benefits that it provides. Sending a draft for approval by the Government does not have the same impact as direct government involvement in its design and preparation. There are also cases in some regions of donor-driven duplication of assessments and reports. Even if the reports are not identical in scope and purpose, opportunities may exist for interaction between the multiple report preparation processes.

45. The extent of the external reporting burden is well documented in the Pacific region, where the secretariat of the Pacific Regional Environment Programme has inventoried over 900 national country profiles and reports for its 21 countries and territories, many prepared by the countries with outside support. Taking only reports with state of environment content, this still averages 20 or more reports for each country, many among the world's smallest, over the past one or two decades. This level of reporting has only been possible as a result of effective regional assistance. The region is also pioneering standardized reporting formats and coordinated reporting to clusters of multilateral environmental agreements to rationalize the process.

46. Investments in capacity-building can have pay-offs in multiple areas, including expanding the informed audience for assessments, contributing to future assessment effectiveness, expanding the ability of decision makers to act on scientific information, equipping participants with new knowledge on assessment methodology and tools and building a scientific community that is more sensitive to needs and concerns of the broader society. The capacity-building associated with the Global Environment Outlook has been influential at the global and subglobal levels. In Africa, for example, the Africa Environment Outlook process has acted as a framework for capacity-building in integrated assessment and reporting. Many individuals involved in producing the first report now constitute a pool of experts in the region who have been used as training resource persons in various countries. Many countries, such as Egypt, Ethiopia, Ghana, South Africa, Uganda and Zambia, have also adopted the Africa Environment Outlook approach and methodologies for their national reporting.

47. In regions where national capacity is limited, a regional support process can be a reasonable option. This can be beneficial for internal reporting, for bringing national issues to the attention of the outside world and for raising funds for environmental management. UNEP collaborating centres have been important sources of regional experience in developing and maintaining national assessment processes.

48. UNEP has long been a leader in capacity-building for national assessment and reporting and this has demonstrated several features of a successful process. It is usually not sufficient to assist in the production of one report alone. It takes more time for an assessment and reporting process to become institutionalized at the national level to the point at which the country can continue on its own. In countries with limited scientific capacity, partnerships between scientific or academic institutions and Governments can create the critical mass of expertise necessary to produce a scientifically credible report.

49. There may be a role for regional or international organizations to maintain an archive of national environmental reports to ensure continuing access regardless of any changes at the country level. Older printed reports can be scanned and included to provide a full series. All countries should be assisted, if necessary, to make their environmental assessment information widely and permanently available.

50. With the acceleration of global environmental change, national environmental issues can no longer be considered in isolation from global pressures and trends. This will require new global science-based frameworks, models and knowledge-management systems providing information on environmental drivers, pressures and impacts that will affect the national environment, and within which national environmental outlooks can then be nested, national scenarios developed and options explored. These national outlooks will in turn provide the framework for local outlooks to guide policy and planning processes.

51. In 1998, the report by UNEP, the United States National Aeronautics and Space Administration and the World Bank (*Protecting our Planet, Securing our Future: Linkages Among Global Environmental Issues and Human Needs*) called for "a more integrative assessment process for selected scientific issues, a process that can highlight the linkages between questions relevant to climate, biodiversity, desertification, and forest issues". The response to this call has been partially fulfilled but much remains to be done. A move towards more integrated "Earth system" assessments could ultimately reduce the number of "single issue" global assessments, provide a more holistic basis for decision-making and reduce reporting requirements to global assessment processes.

B. Future directions

52. One component of good environmental governance is to provide a strong scientific foundation for environmental decision-making. UNEP will work upon request, and within the "Delivering as one" approach framework, with countries in which environmental assessment is weak or non-existent to build their reporting capacity until it becomes self-sustaining. It will encourage regional cooperation in assessment and reporting, as this is a more effective way to deliver training, to communicate environmental conditions at various scales and to have access to appropriate regional expertise. The UNEP training manual on integrated environmental assessment is being customized for each region and used for widespread training of experts involved in environmental assessment and reporting. Similarly, the Global Environment Outlook for Cities methodology is being customized for city-level assessment and reporting. UNEP will continue to pioneer the use of rapidly-evolving information technologies to increase the range and cost-effectiveness of training for environmental assessment and reporting.

53. UNEP will seek opportunities to join with multilateral environmental agreements and other partners to simplify reporting requirements and to make them more coherent, such as by preparing common formats and schedules for reporting to a number of related conventions or processes.

54. To improve the use of national assessments in policymaking, UNEP and its partners will maintain web-based assessment databases with links to national assessment processes and review their content for trends of significance at the regional and global levels. Countries should make an effort to populate these databases and document reports in local languages.

55. Assessment processes at the global and regional levels must become more effective in linking knowledge to action. Documentation of the process should be easily available to enable learning about appropriate design of assessments and a deepening of the understanding as to what makes assessments more effective.

VI. Future global assessment of environmental change

A. Mandate, objective and added value of UNEP global assessment

56. Decision SS.X/5 (paragraph 7(b)) requested the Executive Director to present to the Governing Council at its next session "options for the possible development of a scientifically credible and policy

relevant global assessment of environmental change and its implications for development, including a cost analysis and an indicative benefit analysis for each option".

57. Within the United Nations system, UNEP has sole responsibility for keeping under review the world environmental situation to ensure that emerging environmental problems of wide international significance are prioritized and receive appropriate and adequate consideration by Governments.⁶ This mandate requires the provision of up-to-date, scientifically credible, policy-relevant information on environmental change worldwide, including analyses of cross-cutting issues and the interlinkages between environmental components and global dependencies, to support decision-making processes at all levels.

58. UNEP global environmental assessment work must meet the overall objective of the organization to provide an overview of the world environmental situation and provide an objective means to help policymakers to set priorities. The main target audience for the UNEP global assessment is policymakers and their advisors, and more specifically, the UNEP Governing Council/Global Ministerial Environment Forum. The analysis and findings of the global assessment should be aligned with the needs and timing of international environmental forums and processes.

59. Future assessments should continue to be framed in the broader context of sustainable development, looking at sustainable development issues through an environmental lens. In examining the interlinkages between environment, development and human well-being, including vulnerability to environmental change, assessments can identify the goods and services through which the environment underpins national economic capital, human health and livelihoods, and the opportunities for poverty alleviation. They can also monitor progress in environmental management over time and the efficacy of policies.

60. The past evolution of UNEP global assessment capacity indicates that a continuing global assessment process will be able to support fully the future programme of work with integration and relevance across the six cross-cutting priorities of the medium-term strategy. Indeed, it will be an indispensable tool for demonstrating the scientific interlinkages across the priority areas – interlinkages that bind the environment together into the coherent operating system upon which all life on Earth depends, but that also could derail policies that fail to take them into account.

61. A well-designed assessment process helps to build a collective policy-relevant knowledge base, in which it becomes clear where the scientific consensus lies, what this implies for policymaking, and where lie the new research questions that deal with the relevant uncertainties and emerging issues. The future assessment should also contribute to the UNEP mission to provide leadership and encourage partnership in caring for the environment, underpin its advocacy role on urgent environmental issues, be catalytic in supporting international environmental governance and help to build more coherence on the environment within the United Nations system.

B. Guiding principles and best practices for future global assessments of environmental change

62. Experiences gained and lessons learned from other assessment processes, including many of the points raised in paragraphs 28–43 in this document and in the initial impact review of GEO4,⁷ provide a wealth of sound guidance principles for ensuring the salience, credibility and legitimacy of assessments, among others goals. For any option selected, the following should be considered as guiding principles and best practices for UNEP to conduct future global assessments of environmental change:

(a) To recognize the Governing Council/Global Ministerial Environment Forum as the main target audience and clearly identify its requirements and expectations from the assessment, designing the assessment to meet those expectations;

(b) To ensure relevance to the cross-cutting thematic priorities of the medium-term strategy, with the opportunity to highlight significant emerging environmental issues within any field;

(c) To build ownership of the process within all UNEP divisions; to establish relevant external partnerships and a mechanism to guide the assessment, including clearly-articulated responsibilities;

- (d) To ensure an adequate funding base;
- (e) To maintain online data and indicators acquisition and support systems;

⁶ General Assembly resolution 2997 (XXVII) of 15 December 1972.

⁷ See document UNEP/GC.25/Inf/13.

(f) To establish the timing, nature and extent of Government and other stakeholder involvement in the assessment process, taking into consideration the need for assessment to be unbiased, independent and scientifically credible; to build in a consultative process between the science and policy communities;

(g) To provide training opportunities and a fellowship programme to build institutional and generational capacity for global environmental assessment;

- (h) To ensure scientific credibility through:
 - (i) Objective procedures and criteria for selecting authors, peer reviewers and other experts, including well-respected scientific experts;
 - (ii) A robust conceptual framework, documenting and using sound analytical methodologies to conduct the assessment and providing clear guidelines for treatment of dissenting views and uncertainty;
 - Using best available scientific data and information, drawing on authoritative assessments in thematic areas and at various geographic levels, and creating additional knowledge as needed;
 - (iv) A comprehensive peer review process;

(i) To ensure comprehensive coverage of issues within the global context while also including regional specificity; to improve synergies between global, regional and national assessment processes;

(j) To maximize policy relevance in contents, key messages and options for action; to include a summary for decision makers, developed through an agreed process with the target audience;

(k) To maximize the use of efficient and cost-effective information technology at all stages in the process;

- (1) To develop a communications and outreach strategy, which includes targeted products;
- (m) To provide free public access to data, reports and other assessment products;

(n) To catalogue and archive data and information for use in future assessments using metadata, electronic databases and data and information management systems;

(o) To document the assessment process; to carry out a post-assessment evaluation.

C. Possible options

63. Five options for the possible development of a future global assessment of environmental change are presented below, together with a cost and indicative benefit analysis for each. Cost estimates have taken into account the following components: production process, external contributions, publication, outreach and communication, data portal maintenance, capacity-building and UNEP staff travel. Cost estimates do not include staff time or take into account inflation.

Option 1: Global integrated environmental assessment updated to use information technology better

64. The first option represents what could be termed as the "classic" global integrated environmental assessment, building on the proven strengths of the participatory, bottom-up approach combined with efficiencies made possible through the use of affordable information and communication technologies. It entails a comprehensive consultative process that recruits main stakeholders and expert groups with lead authors to draft content and that then involves a governmental and expert peer-review process to assure the relevance and high quality of the assessment outcomes. Wide global and regional capacity-building (using e-learning tools where appropriate) and partnership development are fundamental elements of the process ensuring that bottom-up regional and thematic inputs fit a unified top-down conceptual framework and assessment methodology. This option is similar to that adopted for the UNEP traditional Global Environment Outlook reports. The assessment report produced in this way could be characterized as "many things for many people". It may include the main stages as follows:

(a) Mainly online participatory consultative process in all regions with UNEP partners, policymakers, representatives of the science community and other relevant stakeholders to solicit input on key regional issues and priorities of policy relevance for the new global assessment;

(b) Planning and design process for UNEP divisions and key partners to define assessment concepts, scope, framework, links to the UNEP programme of work, analytical tools to be applied and the overall production process. An interdivisional task force would be established;

(c) Analysis and drafting process overseen by UNEP, conducted and coordinated online, with two face-to-face production meetings with all authors. Chapter working groups will work closely with relevant UNEP divisions through electronic means;

(d) Online working groups to determine data requirements, to develop an outreach and communication strategy and to identify capacity-building needs and plan interventions;

(e) Online peer-review process;

(f) Comprehensive global assessment report available only in electronic format with a summary for decision makers available in hard copy. If this were completed by 2012, it could mark the fortieth anniversary of the 1972 United Nations Conference on the Human Environment and twentieth anniversary of the 1992 United Nations Conference on Environment and Development;

(g) Variety of customized products for specific target groups.

65. Within UNEP, divisional coordinating authors from the Division of Environmental Policy Implementation, the Division of Technology, Industry and Economics and the Division of Environmental Law and Conventions will conduct parts of the assessment; the Division of Communications and Public Information will be responsible for outreach and communication activities; the Division of Regional Cooperation will work closely with the Division of Early Warning and Assessment at the regional level. The Division of Early Warning and Assessment will lead the interdivisional task force. This option will also strengthen links with multilateral environmental agreements and their programmes of work by involving them in the process.

66. Indicative benefit analysis: The "classic" global integrated environment assessment is a robust and inclusive process, capable of generating credible, legitimate and relevant assessments and related products. It has several clear benefits accruing from the fact that it would build on the past Global Environment Outlook process – including access to a large group of assessment practitioners already skilled in integrated environmental assessment and to collaborating centres familiar with participatory global processes. The option allows for the full participation of all relevant stakeholders, especially if a programme can be established to organize community-based opportunities for engagement with vulnerable populations without internet access. In addition, an extensive and diverse user community is already familiar with the type of products that would be delivered and there is a level of confidence and goodwill with the product brand. Tailor-made capacity-building support mechanisms and training materials in integrated environment assessment methodologies already exist.

67. *Cost analysis*: \$6.5–7 million over four years.

Option 2: Objective expert outsourced assessment

68. The second option provides what could be termed an "expert opinion" report that relies on individual experts and their associated organizations being contracted to conduct an arms-length assessment of the global environment. It is largely top-down in terms of methodology and decision-making during the production process. The thoroughness and quality of the assessment outcomes are ensured through internal and external review processes. Divisional responsibilities are minimal and largely confined to reviewing drafts. This approach does not normally provide for a comprehensive capacity-building and partnership development component. This option follows the approaches used to prepare the United Nations Development Programme *Human Development Report* and the *World Resources Report* led by World Resources Institute. If that model is followed, a national reporting programme could be established or build upon existing UNEP national and city-targeted work. Emerging challenges can be captured by ensuring that the experts are working at the cutting edge of research and development. The outcome of the process will be one assessment report of some 400 pages that can be easily cited and made available for download with associated data sets.

69. *Indicative benefit analysis*: The independence of the analysis cannot be disregarded. An "arms-length" assessment implies less likelihood that results and outcomes will be influenced by the expectations of the target audience. Potentially, the credibility of the science could be assured, free of the constraints of UNEP limitations, especially since the summary for decision makers would not be negotiated. The cost of production would generally be lower in comparison with other options, reflecting the absence of a comprehensive capacity-building and partnership development component in addition to reduced UNEP staff costs because the work would be largely outsourced. There is the suboption of establishing a capacity-building component modelled on the *Human Development Report*.

70. Cost analysis: \$3 million over two years.

Option 3: Coherent set of integrated and thematic UNEP assessments

71. The third option provides a set of integrated and thematic assessments that focus on the needs and expectations of specific target audiences while filling major environmental assessment gaps,

particularly those identified within the six cross-cutting priority areas of the UNEP medium-term strategy. Individual thematic assessments are phased sequentially or in parallel, depending on the policy cycles that they target and, over time, a more coherent assessment landscape emerges. The option can also readily incorporate timely analysis of emerging challenges through rapid expert assessments, assuming that subprogramme resources can accommodate them at short notice. Periodically an overarching integrated and cross-cutting analysis is prepared that focuses on interlinkages. As with option 1, a comprehensive capacity-building and partnership development component can be accommodated. Being spread across the entire programme of work, this option does run the potential risk of diluting the science base of the environment assessment legacy of UNEP – a possibility that can be forestalled through careful design and adherence to established scientific quality control standards and procedures.

72. The evolving set of thematic assessments – each conducted within a six-month to two-year period – will be accompanied by a global assessment on the interlinkages between these priority areas, produced every four to five years. This global assessment will include:

(a) Mainly online participatory consultative process in all regions with UNEP partners, policymakers, representatives of the science community and other relevant stakeholders to solicit input on key regional issues and priorities of policy relevance for the new global assessment;

(b) Planning and design process for UNEP divisions and key partners to define assessment concepts, scope, framework, links to the UNEP strategy and programme of work, analytical tools to be applied and the overall production process;

(c) Analysis and drafting process to be conducted and coordinated by UNEP online, with two face-to-face production meetings with all authors. Chapter working groups will work closely with relevant UNEP divisions through electronic means.

(d) Online working groups to determine data requirements, to develop an outreach and communication strategy and to identify capacity building needs and interventions;

- (e) Online peer-review process;
- (f) Global assessment report on interlinkages;
- (g) Variety of customized products for specific target groups.

73. Under this option, the Division of Early Warning and Assessment will be responsible for the global assessment on cross-cutting issues and interlinkages while UNEP thematic priority area lead divisions will be responsible for the thematic assessments. This will entail a considerable level of staff commitment to accomplish the intense research and analysis required to tackle thematic priority area concerns. The Divisions of Regional Cooperation and Communications and Public Information will play crucial roles in regional capacity-building and outreach and communication, respectively. This option will also strengthen links with multilateral environmental agreements and their programmes of work by involving them in specific assessments.

74. *Indicative benefit analysis*: A flexible and inclusive option that allows for relatively rapid response to meet user needs. Thematic assessments on UNEP priority issues will deliver in a shorter time frame than if dependent on a longer-term comprehensive assessment cycle. The opportunity to address environmental governance specifically on an annual or biennial basis would allow for identifying the inadequacies of some responses and exploring the obstacles to good governance in ways that UNEP has not yet attempted. Assessment partners would have the opportunity to participate in UNEP processes on a regular or continuous basis, thereby increasing the chances of sustaining capacity. As it contains many elements of integrated environmental assessment, this option will benefit from more than a decade of UNEP investment and experience in integrated environmental assessment processes, methodologies and capacity-building.

75. *Costs analysis*: \$8–10 million over five years.

Option 4: Indicator-based approach:

76. Under this option, UNEP will produce an interactive tool that contains a description and analysis of environmental problems (related to cross-cutting thematic priorities) based on data-derived indicators and geospatial information. This option will give more attention to the visualization of environmental data and trends. Whilst using best available scientific data, the complexity and rigour of analysis is lower as compared to the first three options. As such, it could not be considered to be a full-blown global assessment. The impacts of such reports on policymakers and the public at large may, however, be significant, provided that there is a well-organized outreach component. Several countries already use this approach for their national state of environment reporting. Since this approach is based upon visualization of available data, the possibility exists that the tool – the visualization capacity –

could influence the choice of issue to be illustrated rather than the level of importance of the issue determining its inclusion. As a result, important environmental parameters may be neglected. Data availability is another major limitation of this option – especially at global level where there are relatively few complete and reliable environmental data sets and many sets are out of date. While this option provides easily read visual products, it would provide limited information and guidance to policymakers. The full indicator set can be updated on a regular basis, for example every one or two years, but there would be little new data to report in this short time interval. The outputs would be better presented entirely online than in printed format.

77. All UNEP divisions will be engaged in providing input and analysis of this indicator-based product. Data providers and monitoring systems will be key partners.

78. *Indicative benefit analysis*: This option would be the least expensive and quickest of the five. Its products would be visually appealing and its messages easily understandable.

79. *Cost analysis*: \$2–2.5 million over two years.

Option 5: Targeted assessments on thematic priority areas supported by a "UNEP-Live" enabling framework

80. This option provides an innovative means for creating and delivering the UNEP global environmental assessment and emerging issue products. This option also features a component that cultivates a participatory community. Monitored and topic-specific online discussion groups at various levels of expertise will shepherd increasing understanding of the complexities involved as a capacity-building component.

81. The assessment process itself will involve a series of continuing global assessments on issues relevant to UNEP priority areas following a two-year cycle. Each global assessment will include:

(a) Stakeholder consultations to define key questions and scope;

(b) Determination of methodologies, data and information to be used for each assessment based on standards and quality assurance measures;

- (c) Analysis of state and trends of the environment;
- (d) Preparation of outlooks and policy options;
- (e) Analysis of vulnerability and interlinkages between the six priority areas;
- (f) Regional and subglobal components;
- (g) A peer-review process;
- (h) Findings produced as non-negotiated summaries for decision makers;
- (i) Outreach and evaluation components for each assessment.

82. The assessment analyses will be conducted by UNEP divisions and key partners who will be identified during the scoping stage. Interactions will be primarily web-based – through the use of internet tools such as "wikis", e-mail, discussion groups and teleconferences and will deliver assessment methods and capabilities through e-learning tools. In the analysis stage of the assessment, modelling will be used to inform and explore the environmental, political, and social debate in the UNEP priority areas. Data requirements will be determined based on the issues to be assessed. Capacity-building needs in each priority issue will have to be defined before a capacity-building plan can be developed.

83. This option builds on existing infrastructure such as UNEP data portals and proposes the development of a web-based tool, an "instrument panel", to make available the results of the global assessments and other resources which UNEP stakeholders can use for their own investigation of interlinkages between the environment and social and economic factors. The results would be presented as maps, statistical graphs, charts, tabular data or as three-dimensional animated visualizations. As a foundation for the global assessment, this option proposes to develop what could be termed a "UNEP-Live", or virtual state-of-the-environment report on the planet, enabling framework of key environmental products and services. It will also provide the basis for the assessment of UNEP and emerging issue functions across all priority areas of the medium-term strategy. Long-term partnerships with leading information technology companies will be essential, in addition to the more traditional thematic assessment partners. Web-tool management will need to be handled by dedicated UNEP staff.

84. *Indicative benefit analysis*: Data, information and assessment findings will be available continuously. The option provides a scientifically credible source for diverse levels of stakeholder involvement. Access to environmental reviews will consolidate environmental information and make it easy to download and use for other applications. This increased capacity will contribute to continuing

professional dialogues and to access and explore complex and sophisticated modelling environments using simple web-based tools. The capacity-building potential is enormous, especially if a programme can be established to organise community-based opportunities for engagement with vulnerable populations without internet access. The option will strengthen existing UNEP infrastructure and networking processes and maximize new opportunities for scientific cooperation while reducing transaction costs over the long term. It will increase flexibility and responsiveness, strengthen the UNEP scientific position and build countries' capacities for exploring and evaluating policy responses to environmental issues. Most importantly, it will provide an enabling framework within which "one-UNEP" global assessments, whereby the various UNEP divisions collectively produce a set of global assessments embracing the six themes of the medium-term strategy, can be conducted.

85. *Cost analysis*: \$14–18 million. This includes start-up costs (\$3 million) and recurrent costs over four years in addition to the costs of conducting the assessments (\$10 million).

D. Preferred option: Option 3, developing over time to option 5 with components from other options

86. Five distinct and achievable options for a possible scientifically credible, policy-relevant global assessment of environmental change have been presented. No single option has all the advantages or disadvantages though some clearly adhere more closely with the guiding principles and best practices for assessment laid out in earlier sections of this document. In addition some will more readily align and integrate with the future subprogrammes of UNEP, facilitate the analysis of cross-cutting and interlinked issues within the programme and act as a strong catalyst for interdivisional cooperation.

87. On balance, option 3 is considered the preferred option in the near term and one that will enable UNEP to deliver a demand-driven, high-quality, independent and policy-relevant stream of products from the scientifically credible global assessment of environmental change. It will be able to capitalize on earlier UNEP investment in building assessment capacity, is relatively flexible and capable of responding to urgent and specific needs in a timely manner, enables stakeholder involvement and encourages interdisciplinary teamwork and diverse exchanges across institutional boundaries. Its data and capacity-building component will allow for catalytic and value added benefits beyond product preparation and still keep the UNEP assessment process lean and cost effective.

88. The online and interactive characteristics of option 5 should be targeted as a model for the long term. Option 5 provides the opportunity for continuous innovation in creating and delivering the UNEP global environmental assessment and emerging issue products. At the same time, it will strengthen existing UNEP infrastructure and networking processes and could optimize new opportunities for scientific cooperation and capacity-building.

89. In addition, the benefits of options not chosen should be closely analysed with the goal of incorporating those benefits into future work. For instance, the arms-length objectivity of option 2 forestalls possibilities that hidden agendas could manifest in the global environment assessment process of UNEP, whether explicitly pursued or implicitly injected. The global assessment products of UNEP are works in progress and should evolve with the technologies and capacities of its main audience, the Governing Council/Global Ministerial Environment Forum, and its more general audience, the constituents of those Governments. At the same time that evolution must take place with the ultimate objective of fulfilling the mandate of UNEP to serve as an advocate for the environment – a unique mandate within the United Nations system.