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Assessment, monitoring and early warning: state of the environment

**Strengthening the scientific base of the United Nations
Environment Programme**

Note by the Executive Director

The Executive Director has the honour to provide, in the annexes to the present note, additional information on several important issues highlighted in document UNEP/GC.23/3, particularly on the proposed new assessment framework tentatively called *Environment Watch*.

Annex I to the present note provides an evaluation of the conclusions and recommendations of the Intergovernmental Consultation on Strengthening the Scientific Base of UNEP (the Science Initiative) in response to the GC/GMEF decision SS.VIII/1 II on international environmental governance. Annex II builds on the call by the Intergovernmental Consultation for a more coherent approach towards keeping the environment under review and describes in greater detail the characteristics and components of the proposed *Environment Watch* framework. Annex III outlines plans for a revitalization of networking structures to support the new framework. Annex IV provides more detailed information on proposed actions by UNEP with respect to environmental indicators as a key element of the new framework.

The remaining five annexes are intended to provide status reports on new and ongoing initiatives. Annex V provides information on ongoing thematic assessments undertaken by UNEP in collaboration with other partners. Annex VI provides information on the regional dimensions of assessment and early warning activities. Annex VII provides a progress report on the Global Assessment of the State of the Marine Environment (GMA) in response to GC/GMEF decision 22/1 II. Annex VIII provides a summary of the outcome of the International Assessment of Agricultural Science and Technology for Development (IAASTD). Annex IX provides background information on the ad hoc intergovernmental Group on Earth Observations (GEO) and the Global Earth Observation System of Systems (GEOSS).

The annexes have been reproduced without formal editing.

* UNEP/GC.23/1.

Annex I

UNEP response to the recommendations of the Intergovernmental Consultation (IGC) on strengthening the scientific base of UNEP

A. General conclusions and recommendations

| IGC Recommendations ¹ | UNEP Response |
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| <p>Para 29: Many of the options for strengthening the scientific base of UNEP set forth in the synthesis report were re-emphasized. It was noted that those options could be mutually supportive.</p> <p>Para 30: There was general consensus that the scientific base of UNEP assessment activities needed to be strengthened, while remaining within the Programme's mandate, bearing in mind the conclusions and recommendations set forth under questions 1 and 2 above. It was recognized that many of the recommendations implied additional activities for UNEP to implement and that such additional activities could not be achieved within current staffing and budget allocations.</p> <p>Para 35: The need to strengthen existing mechanisms in a coherent fashion was emphasized. Options for strengthening the scientific base of UNEP might include:</p> <p>(a) Setting assessment priorities within the context of the internationally agreed Millennium Development Goals and the Plan of Implementation of the World Summit on Sustainable Development in the form of a coherent environmental assessment partnership framework;</p> <p>(b) Promoting cooperation and synergy between intergovernmental organizations, multilateral environmental agreements and regional environmental forums, in particular through more efficient use of existing mechanisms;</p> <p>(c) Exploring the requirements for interactive mechanisms for strengthening the interface between science and policy;</p> <p>(d) The Executive Director to convene scientific advisory bodies, possibly drawing upon the experience, expertise and resources of the Scientific and Technical Advisory Panel (STAP) of the Global Environment Facility (GEF) to follow up the conclusions and recommendations of the consultation;</p> <p>(e) Strengthening cooperation with United Nations bodies, international financial institutions, intergovernmental organizations, non-governmental</p> | <p>Many of the specific activities outlined in the following sections also apply to this set of general conclusions and recommendations. What is outlined below clearly indicates that the Executive Director can respond to many of the recommendations, within the priorities set out in the programme of work if the appropriate resources are available.</p> <p>In paragraphs 30, 32 b. and 32 e. the Intergovernmental Consultation clearly recognized that the conclusions and recommendations on strengthening the scientific base of UNEP implied additional activities for UNEP, which require strengthening the capacities and expertise of UNEP itself as well as the need for additional staffing and budgetary resources, and a strengthened regional presence.</p> <p>The intergovernmental consultation reiterated the central role of the GC/GMEF in determining priorities for assessment and monitoring, and the need to strengthen existing mechanisms in a coherent fashion. The Executive Director has outlined a plan for the development of a coherent assessment partnership framework for keeping the environment under review (see section 2. below), which is tentatively called <i>Environment Watch</i>. The framework would be conceptual, not institutional, and aim at promoting concerted action among the numerous actors active in the field. It would also identify how to strengthen the science-policy interface.</p> <p>The Executive Director is planning to make active use of issue driven ad-hoc scientific advisory bodies and expert groups such as for the preparation of the fourth Global Environment Outlook (GEO-4). In this respect experience will be drawn from the GEF STAP including from its work on inter-linkages.</p> <p>The newly launched International Assessment of Agricultural Science and Technology for Development (IAASTD) is a good example of inter-agency collaboration with six agencies (FAO, UNEP, UNDP, UNESCO, WHO, World Bank) and the GEF co-sponsoring an assessment of agricultural science and technology for</p> |

² Each recommendation is presented verbatim and preceded by the appropriate paragraph number from the Report of the Intergovernmental consultation on strengthening the scientific base of UNEP (UNEP/GCSSVIII/5/Add.4, annex 1.) for ease of reference.

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| <p>organizations, scientific and academic institutions, the private sector and think-tanks;</p> <p>(f) Including local and traditional knowledge and experts in the processes of data collection and environmental assessment.</p> | <p>development. The assessment carried out extensive regional and global intergovernmental and multi-stakeholder consultations, and has established a multi-stakeholder bureau to guide it.</p> <p>UNEP will draw on the experience of the Millennium Ecosystem Assessment (MA), the Convention on Biological Diversity (CBD) and other work to establish how indigenous knowledge can be incorporated into assessments including GEO-4 and the newly launched IAASTD.</p> |
| <p>Para 34: The consultation confirmed the findings in the synthesis report regarding the present differences in views concerning the establishment of an intergovernmental panel on global environmental change.</p> | <p>Given the lack of consensus on this issue, UNEP is taking a functional approach rather than focusing on institutional mechanisms. The <i>Environment Watch</i> partnership framework is proposed as a coherent and dynamic framework for keeping the environment under review. Governments may wish to consider ways and means for further strengthening the key functions relating to the responsibility of GC/GMEF in this respect.</p> |
| <p>Para 36: Mainstreaming and strengthening of gender perspectives in environmental assessments and early warning at all levels should be ensured.</p> | <p>UNEP is actively mainstreaming gender perspectives into its environmental assessment activities. Gender and environment is the feature focus of the GEO Yearbook 2004 and of the 23rd session of the Governing Council in February 2005.</p> |

B. Assessment of existing environmental challenges

| IGC Recommendations | UNEP Response |
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| <p>Para 2: Many of the assessment needs identified in the synthesis report were reiterated. It was noted that there was a need to establish longterm assessment priorities at both the international and national levels in support of adaptive environmental monitoring and management.</p> <p>Para 3: It was recognized that there was a continuing need to assess current environmental challenges and identify new and emerging issues.</p> <p>Para 5: Various countries highlighted a number of specific national and regional requirements that should be addressed, such as water, land degradation, forests, chemicals, biological diversity, ecosystem services, consumption and production, environment and human health, and the environmental dimensions of pre- and post-conflict situations.</p> <p>Para 6: Special attention should be given to national, subregional, regional and international constituencies such as small island developing states.</p> <p>Para 21: It was suggested that UNEP could offer an umbrella for coordination by taking periodic stock of ongoing environmental assessment activities, while avoiding duplicating, complicating or interfering with existing mechanisms where those were working well.</p> | <p>Since 1995, the comprehensive Global Environment Outlook (GEO) reports, as well as specialized thematic reports have been the main UNEP vehicle for supporting the GC/GMEF in exercising its mandate to keep under review the state of the global environment and identify new and emerging issues. In addition to the global report, more than 50 regional, subregional, national, city level and thematic assessments have been completed or in preparation under the GEO report series. The modular approach suggested under the <i>Environment Watch</i> framework may further facilitate the ability to address specific environmental challenges in different geographic locations.</p> <p>To assist the GC/GMEF in its work and make relevant data and information available in a more timely manner, the GEO report series has been supplemented by the annual GEO Yearbook since 2004. UNEP is responding to this cluster of key recommendations through its POW preparing documentation on the state of the environment and emerging issues for the consideration of the Governing Council and other relevant forums including by:</p> <ul style="list-style-type: none"> • Continuing to produce the comprehensive GEO report, with the fourth report (GEO-4) scheduled to be published in 2007; • Producing the annual GEO Yearbook, |

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| <p>Para 37: The central role of the Governing Council/Global Ministerial Environment Forum in determining priorities for assessments was emphasized. The ability of UNEP to respond to emerging issues and natural disasters was also recognized. Many additional topics were suggested for consideration, particularly water-related topics.</p> | <p>with the next one to be launched at GC23 in February 2005;</p> <ul style="list-style-type: none"> • Continuing and expanding production of regional, subregional, national, city level and thematic reports using the GEO methodology under the GEO report series; • Responding to the needs of specialized constituencies through production of targeted reports such as a second series of SIDS Environment Outlook reports on the Caribbean, Pacific, Atlantic and Indian Ocean islands for the Barbados+10 meeting in January 2005, the report Understanding Environment, Conflict and Cooperation published in September 2004, and support to the International Conference on the Great Lakes. |
| <p>Para 4: Need for an assessment of data collection and monitoring methodologies, including cost-effectiveness, standardization and interoperability of data sets to facilitate exchange of environmental information.</p> | <p>Such an assessment is a major undertaking, which should be done with relevant partners. UNEP recommends that this should be addressed in the context of participation in the Global Earth Observation System of Systems (GEOSS) and the Integrated Global Observing Systems Partnership (IGOSP).</p> |
| <p>Para 21: It was suggested that UNEP could offer an umbrella for coordination by taking periodic stock of ongoing environmental assessment activities, while avoiding duplicating, complicating or interfering with existing mechanisms where those were working well.</p> | <p>UNEP is carrying out a pilot activity to “map the assessment landscape” with extra-budgetary resources during the 2004-2005 biennium. This pilot exercise aims to provide an overview of thematic and geographic coverage and scope of environmental assessment activities, identify gaps and assist in priority setting. It is anticipated that a full mapping can be carried out under POW for 2006-2007.</p> |

C. Assessment of interlinkages

| IGC Recommendations | UNEP Response |
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| <p>Para 7: The need to assess interlinkages, as identified in the synthesis report, was reiterated. Interlinkages included major environmental challenges interlinked through systemic interactions and feedback and through policy and technology trade-offs. They also included environmental and development challenges interlinked through complex interactions between human society and the natural environment. Various countries highlighted the need to assess the interlinkages between environmental degradation and issues such as transport, poverty, demographic pressure, trade and gender. Such assessments were needed to underpin the integration of environmental concerns into sectoral plans and policies, and to assess their social and economic implications.</p> <p>Para 8: The recommendation from the scientific and technical meeting that a scientifically based interlinkages assessment should be developed in cooperation with multilateral environmental agreements and with other relevant actors was welcomed; it was stressed, however, that such an</p> | <p>UNEP, the US National Aeronautics and Space Administration, and the World Bank produced the inter-linkages report <i>Protecting Our Planet Securing Our Future</i> in 1998. More recently, the GEF Scientific and Technical Advisory Panel (STAP) has completed an interlinkages assessment in relation to the GEF focal areas. Other related work has been done by the CBD and the Intergovernmental Panel on Climate Change (IPCC).</p> <p>UNEP has outlined a series of informal consultations regarding a possible assessment of inter-linkages in follow-up to this recommendation. Further consideration of this issue will be given within the context of the design and production of the next GEO report (GEO-4) by inviting leading expertise in the field to assess the latest state of knowledge on scientific and response related inter-linkages among different environmental issues in a development context. Other activities such as the pilot mapping and development of the <i>Environment Watch</i> framework will also contribute.</p> |

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| <p>assessment must be focused, must address the key questions and must be related to the needs of Governments.</p> <p>Para 22: Although some attempts had been made to assess the interlinkages between environment and development, and between the various environmental challenges, greater attention needed to be given to the considerations identified under question 1 above, and those could also be integrated into the Global Environment Outlook process.</p> <p>Para 23: Full use should be made of the competence and expertise available within all relevant United Nations agencies, intergovernmental organizations, other organizations and stakeholders in environmental assessments.</p> <p>Para 33: It was noted that the Executive Director of UNEP, in follow-up to the conclusions and recommendations under questions 1 and 2 above, might outline the draft characteristics of a possible assessment of interlinkages. It was noted that, to be practical, interlinkage assessments must be focused.</p> | |
| <p>Para 8: In that connection it was considered highly desirable to map the current assessment landscape, including interlinkages, as a basis for improved understanding of current activities and for improved coordination. Such an approach should cover linkages between environment and development in the context of the internationally agreed Millennium Development Goals² and the Plan of Implementation of the World Summit on Sustainable Development.³</p> | <p>UNEP is carrying out a pilot activity to “map the assessment landscape” with extra-budgetary resources during the 2004–2005 biennium. This pilot exercise aims to provide an overview of thematic and geographic coverage and scope of environmental assessment activities, identify gaps and assist in priority setting. It is anticipated that a full mapping can be carried out under POW for 2006–2007.</p> |

D. Scientific credibility, legitimacy and relevance in environmental assessment processes

| IGC Recommendations | UNEP Response |
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| <p>Para 9: Scientific credibility would be enhanced by engaging the best scientific expertise to undertake independent, peer-reviewed assessments, taking into account regional balance.</p> <p>Para 11: Interaction between science and policy was seen as essential to ensure legitimacy and relevancy in environmental assessment processes. Such interaction could be achieved through more effective intergovernmental and multi-stakeholder consultations.</p> <p>Para 31: Strengthening the scientific credibility of the Global Environment Outlook process could</p> | <p>The scientific credibility, legitimacy and relevance of UNEP’s assessment activities will be strengthened during the biennia 2004–2005 and 2006–2007, with a primary focus on the GEO process, by:</p> <ul style="list-style-type: none"> • Developing a coherent assessment partnership framework for all assessment activities; • Establishing a Scientific Advisory Committee (SAC) for GEO -4; • Strengthening participation by scientists and developing countries in the GEO process i.. through more extensive use of expert groups; • Strengthening the Collaborating Centre network; • Regional and global multi-stakeholder consultations during the planning and design phases |

² See A/56/326 and A/58/323.

³ *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August–September 2002* (United Nations publications, Sales No. E.03.II.A.1 and corrigendum), chap. I, resolution 2, annex.

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| <p>include:</p> <p>(a) Strengthening the linkages with other assessments and the international scientific community;</p> <p>(b) Improving the quantity, quality and accessibility of environmental data;</p> <p>(c) A further strengthening of the scientific peer review process for the Global Environment Outlook;</p> <p>(d) Strengthening and expanding the network of collaborating centres with additional institutions of high scientific credibility in all regions.</p> | <p>of GEO-4 (Sept. 2004 – Feb. 2005);</p> <ul style="list-style-type: none"> • Addressing the data issue (see below); • A thematic modular approach; • A further enhanced scientific and governmental peer review process; and • Increased capacity-building with particular focus on developing countries. <p>Other areas which will be strengthened include thematic assessments, early warning, observing and monitoring, environmental indicators, networking for data and information management, and regional activities.</p> |
| <p>Para 10: Sound assessments must be based only on reliable data; for most environmental issues, however, data quality and quantity needed to be improved. A key challenge, particularly in developing countries, was to improve the collection, management, analysis and sharing of reliable environmental data through innovative, cost-effective approaches, enabling countries to manage their environmental resources better and participate effectively in international environmental assessments.</p> <p>Para 24: The data issue was identified as a key component underpinning scientific credibility, and more needed to be done to improve collection, analysis and sharing of information.</p> | <p>UNEP's POW for 2006-2007 includes:</p> <ul style="list-style-type: none"> • An up-to-date set of databases with targeted scientific and technical information on and for assessments, early warning of emerging issues, environmental indicators, monitoring, observing systems and analyses at the global and regional levels through collaborations with United Nations Agencies, MEAs and other partners and in support of national and regional data collection and harmonization as well as the development of indicators such as GEO databases. • An up-to-date set of web-based tools for access to and sharing of targeted scientific and technical information, <i>inter alia</i>, based on a up-to-date set of scientific data and information related to assessments, environmental indicators, monitoring, observing systems and analyses at the global and regional levels, e.g. UNEP.Net, and data-portals. |
| <p>Para 25: The outcome of the Earth Observation Summit,⁴ held in Washington D.C. on 31 July 2003, and the continuing work of the <i>ad hoc</i> Group on Earth Observations, established by the Summit, offered opportunities to improve environmental assessment and monitoring.</p> <p>Para 12: Indigenous and local knowledge was identified as an important resource that must be protected, managed and incorporated in assessments as appropriate.</p> | <p>UNEP has actively participated in the <i>ad hoc</i> intergovernmental Group on Earth Observations process which came out of the Earth Observation Summit, and in the development of a Ten-year Implementation Plan for GEOSS. UNEP is also a member of several working groups dealing with different strategic issues such as on International Cooperation (governance issues), Capacity-building (social benefits and developing country issues), and User Requirements and Outreach (high priority requirements for future Earth observations).</p> <p>UNEP recommends that the recommendation for an assessment of data and monitoring methodologies be addressed in the context of participation in GEOSS and IGOSP.</p> <p>UNEP will draw on the experience of the MA, CBD and other work to establish how indigenous knowledge can be incorporated into assessments including GEO-4 and the newly launched IAASTD.</p> |

⁴ See <http://www.earthobservationsummit.gov/>.

E. Cost-effectiveness, cooperation and strengthening of existing institutions

| IGC Recommendations | UNEP Response |
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| <p>Para 13: Cost-effectiveness, cooperation and strengthening of existing institutions and multilateral environmental agreements must be improved. Regional consultation, cooperation and networking were seen as critical to linking assessments across differing scales and to strengthening information sharing.</p> <p>Para 26: Much scope existed for improved cooperation with other United Nations agencies and with convention secretariats, as well as with regional ministerial forums, to maximize synergies and take advantage of economies of scale through effective utilization of mechanisms such as the Environmental Management Group⁵ and Earthwatch.⁶</p> | <p>The pilot activity to map the assessment landscape, which aims to provide an overview of thematic and geographic coverage and scope of environmental assessment activities, identify gaps and assist in priority setting, will assist cost-effectiveness, cooperation, networking and linking assessments.</p> <p>Regional and global multi-stakeholder consultations have been, and are being, carried out during the planning and design phases of GEO-4 (Sept. 2004 – Feb. 2005).</p> <p>This recommendation was discussed by Earthwatch, which felt it could facilitate periodic stocktaking and promote issue-driven partnerships amongst members. Issue-driven cooperation can also be addressed by the EMG.</p> <p>The newly launched IAASTD is a good example of inter-agency collaboration with seven agencies (FAO, UNEP, UNDP, UNESCO, WHO, World Bank and GEF) co-sponsoring an assessment of agricultural science and technology for development. The assessment carried out extensive regional and global intergovernmental and multi-stakeholder consultations, and has established a multi-stakeholder bureau to guide it.</p> |
| <p>Para 14: Greater consideration should be given to analysing the direct, indirect and opportunity costs of environmental degradation in relation to social and economic planning.</p> | <p>This recommendation will be incorporated into relevant assessment activities, including the GEO process, as appropriate. It is being considered in the subprogramme on policy development and law in the area of environment and poverty alleviation strategies. It is also addressed through the subprogramme on technology, industry and economics, including through environmental impact assessment, strategic environmental assessment and green accounting. It is further addressed through integrated assessment and planning, including the environmental impacts of macroeconomic and trade policies, sustainable production and consumption, life-cycle management, green design, and sustainable procurement in sectors such as manufacturing, tourism and extractive industries.</p> |

⁵ See <http://www.nyo.unep.org/emg1.htm>.

⁶ See <http://earthwatch.unep.net/index.php>.

F. Developing -country participation and capacity-building

| IGC Recommendations | UNEP Response |
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| <p>Para 15: There was strong support for improving national capacities in developing countries for data collection and analysis and for environmental monitoring and integrated assessment. Specific requirements included development of institutional capacities, staff training and the transfer of appropriate technologies and methodologies.</p> <p>Para 16: The need to increase the number of scientists able to understand policy-making processes and provide policy-relevant advice to decision-makers at the relevant levels was recognized.</p> <p>Para 17: There was a call for greater involvement of developing country scientists and research institutions in international environmental assessments.</p> <p>Para 28: The role of UNEP in collaborating with centres of excellence in developing countries, the twinning of institutions from the North and the South and encouraging South-South cooperation were seen as an important function that needed further strengthening. In that regard, the need for increased qualitative and quantitative capacity on the part of UNEP regional and outposted offices was seen as important.</p> <p>Para 32: The efforts of UNEP in capacity-building in environmental research, monitoring and assessment was seen as vitally important and must be strengthened and expanded at national, subregional and regional levels. Such efforts should be taken into account in the development of the strategic plan for technology support and capacity-building requested by the Governing Council/Global Ministerial Environment Forum in its decision 22/17 I. Measures that could be taken included:</p> <ul style="list-style-type: none"> (a) Strengthening capacity for environmental research, data collection and analysis; (a) Strengthening of the assessment and monitoring capacities and expertise of UNEP; (b) Strengthening cooperation and support to national, subregional and regional institutions, including through scientific exchanges and establishing environmental and interdisciplinary information networks; (c) Strengthening cooperation with and support to regional bodies and initiatives for the assessment and early warning of emerging environmental issues, particularly within the context of regional frameworks such as NEPAD and other regional and subregional initiatives; (d) Strengthening the regional and subregional presence of UNEP, where appropriate, for more effective and comprehensive environmental assessments; (e) Further strengthening the scientific credibility and expanding the collaborative assessment and monitoring structures of the Global Environment Outlook and other UNEP assessments with collaborating centres, at all | <p>UNEP is responding to this critical cluster of recommendations through a structural reorganization which will put much more emphasis on capacity-building partnerships and developing country involvement in environmental assessment, monitoring and research as priority activities.</p> <p>A major vehicle for this response will be strengthening the capacity-building activities under GEO and other assessment processes through:</p> <ul style="list-style-type: none"> • Increasing the numbers of scientists involved in the assessments, particularly from developing countries, through multi-stakeholder consultations, through an expanded network of Collaborating Centres and through an expanded peer review process; • Reviewing and expanding partnerships and Collaborating Centres involved in assessment activities; • Increasing support for the production of regional, subregional, national, city level and thematic assessments using the “learning by doing” approach to developing capacity and involvement in environmental assessment activities; • Increasing capacity-building for data collection, harmonization, analysis, the development of environmental indicators and the establishment of regional data portals; including links to capacity-building activities of the Global Earth Observation System of Systems (GEOSS); • Continuing and expanding the South-South, North-South and East-West collaboration, twinning arrangements and post-training support already being implemented, particularly under GEO; • Responding to the needs of specialized constituencies through production of targeted reports such as a second series of SIDS Environment Outlook reports on the Caribbean, Pacific, Atlantic and Indian Ocean island for the Barbados+10 meeting in January 2005, the report Understanding Environment, Conflict and Cooperation published in September 2004, and support to the International Conference on the Great Lakes; • Addressing the science-policy interface through increased multi-stakeholder consultations and collaboration; • Strengthening the capacity of policy makers to understand the utility of and use environmental assessments through the production of targeted information and related capacity-building; and • The development of a coherent |

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| <p>levels, including those of developing countries and of countries with economies in transition;</p> <p>(f) Strengthening the awareness of policy-makers of the value of environmental research for decision-making;</p> <p>(g) Support for assessments of environmental issues of regional and subregional importance, including support provided through collaborating centres;</p> <p>(h) Promotion of coherent partnership approaches to capacity-building and mobilization of resources for development of methodologies, training and institutional training.</p> <p>Para 27: The important role of UNEP in capacity-building was noted, particularly that of collaborating centres in developing countries through the Global Environment Outlook process. That role should be linked, however, to the intergovernmental strategic plan for technology support and capacity-building to be presented to the Governing Council/Global Ministerial Environment Forum at its eighth special session, in March 2004.⁷</p> | <p><i>Environment Watch</i> assessment framework.</p> <p>Further initiatives will depend on the outcomes of the Intergovernmental Strategic Plan for Technology Support and Capacity-building.</p> <p>In paragraphs 30, 32 b. and 32 e. the Intergovernmental Consultation clearly recognized that the conclusions and recommendations on strengthening the scientific base of UNEP implied additional activities for UNEP, which require strengthening the capacities and expertise of UNEP itself as well as the need for additional staffing and budgetary resources.</p> <p>UNEP's capacity-building activities in environmental assessment are reflected in the Intergovernmental Strategic Plan for Technology Support and Capacity-building which will be presented to the Governing Council at its 23rd session, in February 2005. Capacity-building is also a core function of the suggested operational component of the <i>Environment Watch</i> framework.</p> |
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See also Governing Council decision 22/17 I.

Annex II

Towards a UNEP *Environment Watch* Framework – Concept and Definition

A. Introduction

1. UNEP has, through its mandate of keeping under review the world environmental situation, mobilized support for a wide ranging set of collaborative processes for collecting, managing, compiling, analysing and sharing data and statistics; monitoring; networking; developing indicators; assessment and early warning for various topics at different geographical scales. In spite of these efforts, the complex interactions between human society and environment are not fully understood. The limited availability of environmental data and information in many regions represents a serious constraint on the ability of the international environmental governance structure to both monitor the state of the environment and make progress towards internationally agreed goals and targets.

2. A number of processes have been put in place involving different institutions and expert communities to keep under review the world environmental situation. The intergovernmental consultations on strengthening the scientific base of UNEP,⁸ also referred to as the Science Initiative, suggested that UNEP could serve as an umbrella for coordination of assessment activities by taking periodic stock of assessment programmes and their related data collection and monitoring activities. The intergovernmental consultations reiterated the central role of the Governing Council (Council) and Global Ministerial Environment Forum (Forum) in determining priorities for assessments and monitoring and addressing the need to strengthen existing mechanisms in a coherent fashion. Options for doing so included setting priorities within the context of development goals in the form of a coherent environmental assessment partnership framework and exploring the requirements for interactive mechanisms for strengthening the interface between science and policy. It was also acknowledged that sound assessments must be based only on reliable data; for most environmental issues, however, data quality and quantity need to be improved. It therefore seems clear that any such framework should not be limited to assessments only, but should cover the wider set of actions related to keeping the environmental situation under review.

3. Given the lack of agreement on establishing an intergovernmental panel on global environmental change, the Executive Director recommends that strengthening the scientific basis of UNEP should focus on function rather than institutional form. It is suggested that a framework for keeping the environment under review, tentatively called *Environment Watch*, be developed. The development of the framework will allow further in-depth consideration of how to best strengthen key functions of UNEP, as an intergovernmental body, for keeping under review the world environmental situation and ensuring that emerging environmental problems are considered by Governments. Such a framework would go beyond assessments and cover a wide ranging set of collaborative processes for collecting, managing, compiling, analysing and sharing data and statistics; monitoring; networking; developing indicators; assessment and early warning for various topics at different geographical scales. The framework will have to draw from the cumulative experience and lessons learned from past and existing assessments and observing and networking systems.

4. The Executive Director's proposed process for the development of the *Environment Watch* framework consists of the following steps:

- (a) Consideration by Council and Forum of the proposal, supported by a draft concept paper outlining the characteristics and components of the framework (see below);
- (b) Nomination of national focal points for the development of the *Environment Watch* framework;
- (c) Intergovernmental and multi-stakeholder consultations on the design of the framework;

⁸ The intergovernmental and multi-stakeholder consultations on strengthening the scientific base of UNEP were initiated by the Governing Council of UNEP in its decision 22/1 I of 7 February 2003 (see also <http://science.unep.org>). This was in response to the conclusion by the Open-ended Intergovernmental Group of Ministers on International Environmental Governance (IEG), which in February 2002 recommended that the increasing complexity of environmental degradation requires an enhanced capacity for scientific assessment, monitoring and early warning. The conclusions and recommendations from the intergovernmental consultations are contained in document UNEP/SI/IGC/3 of 14 January 2004.

(d) Establishment of a trust fund for the development of the framework that will complement Environment Fund and extra-budgetary sources; and

(e) Presentation of the proposed framework for the consideration by the ninth special sessions of the Council and Forum.

5. The aim of this concept paper is to outline the proposed characteristics and components of the *Environment Watch* framework. The paper is based on the conclusions and recommendations of the Science Initiative and on the experience from past assessments, observing systems, networking and capacity-building initiatives.

B. The challenge

6. Keeping under review the world environmental situation and ensuring that Governments consider emerging environmental problems are formidable challenges that require actions beyond those undertaken by UNEP alone.⁹ The intergovernmental consultations stressed the central roles of the Council and Forum in determining priorities for assessments and monitoring within the context of the development goals. The Millennium Development Goal (MDG) 7, Ensuring Sustainable Development, is particularly relevant since it is covering the environmental dimension of the other MDGs. Its target number one is to “integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources” Meeting such a target will be a major challenge for environmental institutions. The challenge is characterized by four complex dimensions (see Figure 1, below).

1. The relationship between environment and development

7. The relationship between environment and development was given prominence in 1972 by the responsibility given to the Council and Forum¹⁰ to review the impact of environmental measures on, and ensure their compatibility with, development priorities of developing countries. Key questions for consideration may include:

(a) How can UNEP improve the understanding of human – environment interactions in order to promote environmental management for human development?

(b) How can UNEP contribute to developing an agreed set of environmental indicators for tracking progress towards the development goals?

(c) How can UNEP undertake research, assessments, observation and data gathering and networking processes so that they provide the knowledge base for mainstreaming of environmental considerations into social and economic sectors?

(d) How can UNEP best address the interlinkages between different environmental challenges in a manner that facilitates the examination of the links between environment and development?

2. The relationship between science and policy

8. The responsibility of improving the relationship between science and policy is central to UNEP’s mandate, and ranges from promoting research, monitoring, and assessment to facilitating UN-wide action. Key questions for consideration may include:

(a) How can the Council and Forum, as policy bodies, help identify policy priorities for research, assessment, monitoring, indicators, data gathering and networking processes given the number of other policy bodies that exist?

(b) How can UNEP best promote the scientific credibility and political legitimacy of assessments, monitoring, indicators, data gathering and networking processes given the increasing diversification, interdisciplinary nature and complexity of environmental challenges?

⁹ A key function and responsibility of UNEP Governing Council, as outlined in General Assembly resolution 2997 (XXVII), is to keep under review the world environmental situation in order to ensure that emerging environmental problems of wide international significance receive appropriate and adequate consideration by Governments. The Council is also responsible for promoting the contribution of the relevant international scientific and other professional communities to the acquisition, assessment and exchange of environmental knowledge and information.

¹⁰ As outlined in UNGA resolution 2997 (1972).

(c) How can the Council and Forum, as a policy body, consider the findings of these processes and translate them into policy recommendations?

3. The issue of geographical scale

9. Although UNEP was established as a global programme, it has clear responsibility for addressing the links between geographical scales. Among the many questions that may be posed are:

(a) How can UNEP best review effects of global environmental change on ecosystems and populations that are particularly vulnerable to such changes?

(b) How can UNEP best review local and national environmental changes that may lead to problems of international significance?

(c) How can UNEP and in particular its Council and Forum strengthen its interaction with regional and subregional ministerial bodies in keeping the state of the environment under review?

(d) How can UNEP best determine which issues need to be considered by governments at the international level and which issues that need to be considered at national and local levels?

(e) How can UNEP contribute to the harmonization, standardization and interoperability of data and information in order to facilitate networking, exchange and comparison of environmental information across geographic scales?

(f) How can UNEP best contribute to sustainable capacity-building and technology support in developing countries and countries with economies in transition to address the above questions?

4. The issue of temporal scale, or time

10. Keeping the environment under review is a task that requires a thorough consideration of both past developments and plausible futures. Among the questions that may be posed are:

(a) How can UNEP review, document and communicate environmental trends in relation to social and economic trends?

(b) How can UNEP promote the development of reliable and comparable time series of environmental data?

(c) How can UNEP issue early warnings of new emerging environmental issues, taking into account the substantial time lag that may exist from human pressures to environmental responses?

(d) How can UNEP promote the use and development of models and processes for establishing plausible futures and scenarios?

(e) How can UNEP identify future environmental changes that may be irreversible?

11. The questions outlined above are derived from the key findings of the Science Initiative. The development of an *Environment Watch* framework would be a vehicle to explore how these findings and recommendations could be converted into specific actions for UNEP and its partners. The framework would be defined within the boundaries of the four dimensions noted above (see Figure 1). As such, it would be founded on best available science, but still be policy relevant and legitimate and facilitate the interaction between science and policy. It would focus on the environment, but be relevant to the development priorities by showing how environmental goods and services contribute to development and how environmental degradation can impede progress towards the development goals and targets. Furthermore, it would cover the global level, but still be relevant to and reflect the specific issues and priorities at other geographical scales. Finally, the framework would be able to promote the understanding of both past trends and plausible futures.

C. Objectives and purposes of the *Environment Watch* framework

12. The *Environment Watch* framework would be developed in support of the relevant functions and responsibilities of the Council, as outlined in United Nations General Assembly resolution 2997 (XXVII), namely:

(a) Keeping under review the world environmental situation in order to ensure that emerging environmental problems of wide international significance receive appropriate and adequate consideration by Governments;

- (b) Promoting the contribution of the relevant international scientific and other professional communities to the acquisition, assessment and exchange of environmental knowledge and information;
- (c) Building capacity and promote technology support for undertaking national and engaging in international processes for monitoring, assessment and early warning.

13. The proposed *Environment Watch* framework would, subject to considerations by the Council and Forum, be developed for the purposes of:

- (a) Promoting the interaction between science and policy-making for addressing gaps and needs and setting priorities for processes related to keeping under review the world environmental situation in order to ensure that emerging environmental problems of wide international significance receive appropriate and adequate consideration by Governments;
- (b) Applying a dynamic set of collaborative processes for networking, monitoring, data collection and management, compilation of statistics and indicators, assessment, information exchange, and early warning in response to policy needs at different spatial scales;
- (c) Strengthening the credibility, legitimacy and relevance of such processes and promote the use of timely, accurate, relevant and reliable data and information, including local and indigenous knowledge;
- (d) Facilitating access to and development of appropriate tools and methodologies including environmental indicators and statistics;
- (e) Promoting capacity-building in developing countries and countries with economies in transition, *inter alia* through the intergovernmental strategic plan for technology support and capacity-building; and
- (f) Facilitating the monitoring, evaluation and periodic stocktaking of processes and activities relevant to the framework.

D. The characteristics and components of the *Environment Watch* framework

14. *Environment Watch* is UNEP's proposed framework for keeping under review the world environmental situation and ensuring that emerging environmental challenges are considered by governments. The context is set out by the functions and responsibilities of the Council and Forum and the Executive Director as outlined in United Nations General Assembly resolution 2997 (XXVII) (1972) and reflected above as well as in Figure 2 below.

15. The framework consists of two components. The first component is an operational one, consisting of functions that are needed to keep the environment under review and the second is a thematic and geographic one characterized by ecosystems and geographic and temporal scales. Both are illustrated in Figure 2.

16. Such a two-tiered approach is needed to meet the growing demand for better data, information and knowledge for decision-making. The framework builds on experience from existing global assessments, such as the Global Environmental Outlook (GEO), the Millennium Ecosystem Assessment (MA), the Intergovernmental Panel on Climate Change (IPCC), the global observing systems and international environmental research programmes. It will be a conceptual framework for intergovernmental cooperation under the Council and Forum based on interactions with the scientific community and other stakeholders for the purpose of keeping the environment under review. It is not intended to create new institutions or coordinate existing ones, but rather to identify how to facilitate concerted action among existing institutions and processes.

1. The operational component of the *Environment Watch* framework

17. The operational component is comprised of administrative, scientific and technical functions that must be in place to support and manage assessments and their related activities. The operational component attempts to capture in a generic way the highly complex processes that are needed to keep the environment under review. The operational component is illustrated by the pyramid shape in Figure 2 below. The core and the four sides of the pyramid represent the following five key functions: linking science and policy; systems and networks; products and services; outreach and communication and the capacity-building function, which forms the core of the operational component. These interlinked functions are further described below.

(a) Linking science and policy

18. This function is critical in terms of identifying needs, priorities, and emerging issues relevant to keeping the environment under review and translating knowledge into policy advice. The need to strengthen the links between science and policy was stressed both in the World Summit on Sustainable Development in 2002 and in UNEP's Science Initiative. The key challenge for UNEP is to design assessment processes that foster a closer relationship between science and policy, at different geographic and temporal scales.

19. Assessments, for instance, are geared towards achieving this interaction, as they are fundamentally communication processes, not simply reports, which share many similar features regardless of their scope (for definition and characteristics see Boxes 1 and 2 below). The key challenge is to design assessment processes that ensure the interaction between science and the different stages of the policy and decision-making cycle at different scales. An outline of the functional links between policy and science through the assessment cycle is presented in Figure 3.

Box 1 Definition of an assessment

An assessment is the entire social process for undertaking a critical and objective evaluation and analysis of information, including indigenous and local knowledge, designed to support decision-making. It applies the judgment of experts to existing knowledge to provide scientifically credible answers to policy relevant questions, quantifying where possible the level of confidence.

Box 2 Characteristics of a credible, legitimate and relevant assessment

- It is a critical, peer-reviewed evaluation of information, for purposes of guiding decisions on a complex, public issue, following a well-defined process.
- The scope (topic under consideration) is defined by the stakeholders, who are typically decision-makers. Findings are policy relevant, but not prescriptive and reflects, for instance, an "if ... then" approach.
- It is conducted by a credible group of experts with a broad range of disciplinary and geographical experience and representation, in a balanced and transparent way.
- It reduces complexity but adds value by summarizing, synthesizing and building scenarios, and identifies consensus by sorting out what is known and widely accepted from what is not known or not agreed.
- It sensitizes scientific communities to policy needs and the policy community to the scientific basis for action.

20. Key mechanisms include the active involvement of intergovernmental and user communities at the global and sub-global levels to ensure the legitimacy, relevance and ownership of the assessments. Their involvement is critical in terms of identifying needs, priorities and emerging issues relevant to keeping the environment under review and translating knowledge into policy advice and action. This can be achieved through intergovernmental and user consultations that will help identify assessment needs, provide advice on assessment process and scope, and receive and consider findings. The consultative process constitutes the governmental and stakeholder part of the assessment cycle as outlined in Figure 3. This part needs to interact closely with the independent scientific and expert part of the cycle and provide the formal or informal link with the advisory and decision making part of the policy group discussions that are a key component of all assessments (see Figure 3 below).

21. Indicators can play a key role in translating complex information on the environment into a form that is readily understandable to policy makers. They can also show progress toward goals and targets. Obtaining agreement on a set of key indicators where data is, or can be made available, is a way of structuring and creating an incentive for long term monitoring and data collection. Some further considerations of this issue are outlined in Annex IV of this information document.

22. An important part of enhancing the link between science and policy is the monitoring, evaluation and periodic stocktaking of processes and activities for watching the environment. In his follow up to the recommendations from the Science Initiative, the Executive Director has already initiated a pilot activity to "map the assessment landscape" (see www.unep.org/pearl to view ongoing activities).

(b) Systems and networks

23. This function covers the technical infrastructure to deliver the data, information and analysis underpinning the thematic components of any assessment. It is critical in terms of gathering and managing data, linking partners, and analysing the state of environmental knowledge. The Science Initiative highlighted a number of important needs in the broad areas of environmental monitoring, data collection and analysis, information exchange and partnerships.

24. The data issue was identified as a key component underpinning scientific credibility of assessments. Regional consultations, cooperation and networking were further identified as critical factors for linking assessments across different geographic scales and to strengthen information sharing. The global observing systems processes, in particular, the *ad hoc* intergovernmental Group on Earth Observations and its follow up the Global Earth Observation System of Systems (GEOSS), the Integrated Global Observing Strategy Partnership (IGOS-P) and the thematic observing systems are key initiatives for gathering and managing data relevant to various thematic and geographic modules. An operational GEOSS could play an important role in delivering Earth observational data to *Environment Watch* that would otherwise be too costly for countries to collect on their own. Additionally, a revitalized networking structure for *Environment Watch* can be used to support additional data provision and facilitate data sharing in direct support of the GEOSS implementation plan. This networking can also be used to disseminate environmental data and related information from both initiatives.

25. A key challenge, particularly in developing countries, is to improve the collection, management, analysis and sharing of reliable environmental data through innovative, cost-effective approaches. The data issue can only be resolved through re-examining UNEP's working arrangements with key national institutions involved in the collection, management and dissemination of environmental data and information. A government-designated National Focal Point (NFP), for the framework based in the principal environmental authority with responsibility for environmental assessment and reporting, would be key to make such a network work. This approach is further outlined in Annex III of this document. It is recommended that a guideline outlining the functions of the national focal points and the network be developed through intergovernmental and stakeholder consultations as part of the *Environment Watch* framework, *inter alia* building on the elements in Annex III. Information held by the network would be discoverable through UNEP's environmental information gateway, UNEP.Net.

26. Global observations, whether from satellites or *in situ*, provide a major source of data and information on our changing environment. Global observations also provide a key input to environmental assessment activities, including the GEO process. Therefore, the ongoing GEOSS process (described more fully in Annex IX) should greatly enhance assessments conducted under the *Environment Watch* framework. The framework, in turn, can be viewed as a major user of global observations and, therefore, UNEP and other United Nations agencies have an important role to play in affecting the types of data delivered from the GEOSS. Increasingly, assessments must incorporate a variety of data and information, from space-based and *in-situ* observations to indigenous knowledge, from measurements of water quality in small streams to archival and even artistic records. Global observations from Earth observing systems provide a major source of data and information on environmental change; processes at national and local levels offer the socio-economic context for that change. It is incumbent on the *Environment Watch* framework to incorporate these extremes in data and information and to more closely link to processes at all spatial levels.

27. At a technical level, there is a need for an assessment of data collection and monitoring methodologies, including cost-effectiveness, standardization and interoperability of data sets to facilitate exchange of environmental information. In this regard, the Food and Agricultural Organization of the United Nations-UNEP joint coordination of the Global Land Cover Network (GLCN) is a case in point. The objective of GLCN is to achieve a global harmonized data base on land cover, the most fundamental data base for monitoring of environment and sustainable development. Through regional, subregional and national training workshops, GLCN is building capacities to allow national institutes and experts to assess and monitor the status and trends of land cover. GLCN does this by providing the remotely sensed land-cover data (using Landsat data sets from 1990 and 2000) and a scale- and user-independent Land Cover Classification System (LCCS2) for harmonized land cover assessment with appropriate software and training.

28. National level data and information must be aggregated to subregional, regional and global levels through close cooperation with partners. The Science Initiative also called for incorporating local experts and indigenous knowledge as important resources in assessments. A method for incorporating such knowledge should be developed under the framework based on experiences from the Millennium Ecosystem Assessment.

29. Expert groups, supported by networks of collaborating centres, typically constitute the independent scientific and expert part of the assessment cycle. These groups provide scientific advice and oversight, undertake assessments and interact with the governmental and stakeholder processes. It is suggested that some guiding principles for assessments under the framework be developed based on the experience from existing assessments such as the Intergovernmental Panel on Climate Change (IPCC) (see Boxes 1 and 2 below).

30. A key element in the analysis of the state of knowledge is the use of models and scenarios. It is crucial to identify centres of excellence with the capacity develop and run models in order to examine plausible futures and scenarios. Socio-economic models need to be linked with ecological models. These models can simplify the operations of complex systems and are essential for examining alternative development paths. The need for a conceptual approach that can incorporate highly complex information and dynamics including non-linear relationships, feedback loops, interactions and thresholds are considered under section 3.1.6.

31. The wealth of environmental data generated by the scientific community also needs to be considered by *Environment Watch*. Assessment and monitoring processes could be designed to link with research programmes and on-site research. Observational data from GEOSS can stimulate further research in key areas and additionally, research goals can be supported through data gathering by GEOSS and *Environment Watch*. Furthermore, socio-economic data generated from traditional data-gathering initiatives, such as a decadal census, can be integrated with Earth observational data and find multiple applications such as scenario modelling.

(c) Products and services

32. This function includes the analysis and synthesis of the data and information underpinning thematic assessments and provides the documentation of methodologies and processes necessary for reporting back to policy makers. The international community has come to realise that environmental assessments are more than just reports and that the process itself is vital for the effectiveness of assessments. Accordingly, products need to document both the results of assessments and the processes undertaken as well.

33. A key mechanism for ensuring the quality of an assessment is to make sure that it undergoes an in-depth expert and governmental peer review. The former ensures scientific credibility and the latter process ensures legitimacy. The peer review typically mobilizes a broad range of experts as well as Governments to provide comments on draft text. Complex assessments normally benefit from two rounds of peer review. Proper mechanisms also need to be put in place to ensure credibility and quality of databases, environmental statistics, web sites and indicator data. Principles and best practices for quality control should be developed under the operational component.

(d) Outreach and communication

34. This function delivers data and information associated with assessments to relevant target groups. It is crucial to ensure that key user groups are identified, products are made available and accessible to users and information products are shared between users. Outreach and communication are key to linking the different components of the assessment under the framework and vital in terms of bringing the knowledge products to the attention of decision-makers.

(e) Capacity-building

35. The capacity-building function forms the core of the operational component of the *Environment Watch* framework and is the central pillar around which the remaining activities are crafted and implemented. The emphasis is on enhancing or building the capacity of collaborating partners to produce high quality assessments and effectively manage data and information. Capacity-building is often two-way and is particularly important for developing countries and countries with economies in transition. It includes mutual institutional cooperation, resource mobilization, training, technology

support, fellowships and support to participation in processes for keeping the environment under review.

36. The intergovernmental consultation strongly endorsed the view that efforts by UNEP to build capacity in environmental research, monitoring and assessment are vitally important and need to be strengthened and expanded at national, subregional and regional levels. Proposed actions include targeted institutional capacity-building through:

- (a) Networking of experts, collaborating centres and partners and ensuring that a sufficient number of collaborating centres with high scientific credibility are involved;
- (b) Strengthening and expanding the network of collaborating centres with additional institutions of high scientific credibility in all regions;
- (c) Participating in environmental assessments, data and information systems at national and regional levels;
- (d) Developing and promoting the use of guidelines, methodologies, technologies and best practices;
- (e) Training and workshops; and
- (f) Providing GEO fellowships to students/scholars to work with UNEP Division of Early Warning and Assessment's regional offices in the GEO process.

37. This component of the framework will also contribute to the implementation of the Intergovernmental Strategic Plan for Technology Support and Capacity-building, presently under development in UNEP. The two initiatives also support each other directly. The consultations under the Science Initiative clearly pointed out the need for capacity-building and technology support to enable developing countries and countries with economies in transition to undertake national and engage in international activities in data, monitoring and assessments. On the other hand, science and information together with norms, good practices and resources constitute the foundation for sustainable institutions for environmental management. Scientific capacity is also a key prerequisite for adaptation of technologies to local conditions as well as for further technological innovation. The development of the *Environment Watch* framework may also contribute to setting long-term priorities for capacity-building activities in the areas of environmental research, monitoring, networking and assessments.

38. An overview of existing capacity-building tools will be undertaken as part of the *Environment Watch* activities and a strategic approach to capacity-building in this area will be established. The approach will build on the GEO and Millennium Ecosystem Assessment capacity-building activities as well as on the recommendations from the Science Initiative, guidance from the intergovernmental strategic plan and the GEO C capacity-building Working Group.

(f) The toolbox and the conceptual approach

39. The toolbox will include tools for undertaking environmental assessments. It will include conceptual frameworks, analytical tools, guidelines, principles and best practices for processes and procedures. The tools will enter the toolbox as they are being developed and may be subject to revisions as required. The tools are important support mechanisms for both the processes and capacity-building activities. An inventory of tools available in the toolbox will be developed.

40. A key to the success of the *Environment Watch* framework is its conceptual approach. An overarching conceptual approach for analysing and understanding the environmental challenges within and between the thematic and geographically defined modules should be characterized by being:

- (a) Able to integrate human (social and economic) and environmental aspects and reflect the contribution of environment to development;
- (b) Universally applicable (at various scales in time and space and across different science and policy processes);
- (c) Value- and ideology-neutral;
- (d) Policy-relevant and intuitively easy to grasp and communicate;

(e) Scientifically relevant and able to support and aggregate highly complex information and dynamics including non-linear relationships, feedback loops, interactions and thresholds; and

(f) Built on and able to integrate existing concepts, perspectives and approaches.

41. To start with, ecological principles may provide some of the basic concepts for interactions between human society and the environment, and current economic, social and ecological models might be useful in establishing a coherent framework. Current conceptual frameworks include the Driving Force – Pressure – State – Impact – Response (DPSIR) framework (see Figure 4, below) which has been used for the GEO process, the IPCC conceptual framework and the Millennium Ecosystem Assessment Conceptual Framework. Other approaches include the human ecosystem model, ecosystem-health approach and studies of resilience and vulnerability of socio-ecological systems.

42. What these frameworks have in common is that they focus on different aspects of the human-environment interaction. The current environmental governance agenda¹¹ can be viewed as representing a number of different entry points for intervening in how humans interact with their environment.

43. A further development of the human-environment interaction conceptual approach should draw from experiences in the policy, assessment, monitoring and research domains. It may serve as a common platform for advancing our analytical approach to assessing environmental challenges as well as for environmental research, monitoring, modelling, forecasting, indicator development, and development and implementation of goals, targets, policies and law. The *Environment Watch* framework should be dynamic and take account of the fact that analyses of environmental challenges can be highly complex and may require a much more sophisticated approach than presently available.

2. The modular component of the *Environment Watch* framework

44. The modular component of the *Environment Watch* framework is intended to be a structured set of review activities or modules that are defined by their thematic and geographical scopes (as illustrated in Figure 2, below). The modules could be linked to reflect larger thematic and geographic scales or de-coupled to reflect narrower coverage. This flexibility is the strength of the modular approach. Modules can be structured at any specific scale and theme under consideration. Modules may vary from covering all environmental aspects of the globe to a specific theme for a country as illustrated in the big and small cubes of Figure 2, respectively. For example, modules could be regional in nature, such as the Africa Environmental Outlook, which covers all environmental themes in Africa, or they could be much smaller and, for instance, address one ecosystem in a specific location.

45. It is also important to take full account of the complexity of themes both within and between different modules. The need for a conceptual approach that can support and aggregate highly complex information and dynamics including non-linear relationships, feedback loops, interactions and thresholds as considered under section 3.1.6 is therefore paramount.

46. Each module would be covered by the operational component, which will be flexible and can be tuned to specific geographic scale, time scale, thematic scope, partnerships, conceptual focus and resources available for each module. The operational component may, in turn, define the module. For example, a module can be defined by focussing on an environmental information networking function such as the African Environmental Information Network (AEIN). Similarly, other modules may be characterized by focusing on monitoring, indicators, assessments or information exchange. Exchange of information among nations worldwide would constitute a prism of the modular cube defined by one side of the operational component or it may focus on a specific set of capacity-building activities.

47. UNEP is in the process of mapping the assessment landscape to ensure that UNEP's own assessments do not duplicate, but draw upon and complement, other environmental assessment activities. The objectives of the mapping exercise are to provide a definitive baseline overview of the thematic and geographic coverage and scope of environmental assessments and to identify the strengths and weaknesses of selected key assessment processes.

48. A thematic and geographic nomenclature may be developed over time if deemed necessary. Keeping the environmental aspects of the freshwater situation in Africa under review may for instance be termed *Environment Watch/Africa/Freshwater*. In this way, key priorities can be identified.

¹¹ See, for example, the Declaration of the First Global Ministerial Environment Forum, 29-31 May 2000, Malmö, Sweden.

(a) The *Environment Watch* framework and GEO and other assessments and observing processes

49. The GEO assessments are produced within a specific conceptual and analytical framework that has evolved over time. The development of a common understanding of the goals and methods of GEO has resulted in a shared nomenclature and coherent methodology for the assessment. However, the intergovernmental consultations pointed to the need to further strengthen several elements in the GEO process, and these are reflected in the operational component of the proposed *Environment Watch* framework. The GEO process, like many other assessments and observing and networking systems, has evolved into a modular approach. Current modules include: the comprehensive GEO (now in its fourth iteration), the GEO Yearbook, and a range of sub-global assessments. These include regional environmental outlooks such as GEO-Latin America and the Caribbean and African Environmental Assessment and environment outlooks for cities.

50. There are also increasing demands for UNEP to contribute to UN-wide thematic assessments, especially to provide the ecosystem perspectives in the areas of the marine environment,¹² freshwater¹³ and land.¹⁴ The status and trends of key biomes need to be assessed on a regular basis. UNEP is therefore exploring the feasibility of establishing GEO ecosystem assessment modules.

51. All the various GEO assessments are clearly defined by their thematic and geographic scope as well as the timescale under consideration. In addition, they all draw upon and are defined by their operational approach, which reflects all the main functions of the operational component described above. Also, the Millennium Ecosystem Assessment, the Global International Waters Assessment, the global observing systems and international environmental research programmes are organized around components (modules) defined by their thematic and geographical coverage and operational approach. The *Environment Watch* framework should therefore be seen as a proposal that builds on and further promotes this evolution.

E. Conclusions

52. The aim of this paper was to present a draft conceptual framework for keeping the environment under review, based on a key recommendation from UNEP's Science Initiative. The framework is tentatively labelled *Environment Watch*. The considerations in this concept paper are based on many of the other conclusions and recommendations from the Science Initiative, and on the experience from existing assessments, observing systems, networking and capacity-building initiatives. The two key components of the framework, as well as key questions for further in-depth consideration of how to strengthen the scientific base of UNEP, have been identified.

53. Three overarching questions have implicitly been considered in this concept paper. They must be answered before embarking upon any process for developing the framework. Therefore, in concluding, the explicit answer to these questions would, from UNEP's perspective, be the following:

(a) Is there a need for an *Environment Watch* framework? The need for the framework was articulated by the intergovernmental consultations on strengthening the scientific base of UNEP. While a number of different institutional arrangements for undertaking assessments are already in place, there is no overarching mechanism available to ensure concerted action among the many actors involved in keeping the environment under review. The development of a conceptual framework can address this gap without creating new and duplicative institutional arrangements. The framework will also allow for further in-depth consideration of how best to address the recommendations from UNEP's Science Initiative. It allows for a careful consideration of how lessons learned at the global level, in the regions and at the national and local levels can be translated into one coherent conceptual framework applicable to addressing the increasing complexity of human-environment interactions. These considerations are paramount in a situation where the relatively limited availability of environmental data and information still represents a serious constraint on the ability of the international environmental governance structure to both monitor the state of the environment and make progress towards internationally agreed goals

¹² In February 2003 the Council/Forum requested the Executive Director to make the necessary arrangements for the active participation and appropriate contribution of the UNEP to the preparatory process for the establishment of the Global Marine Assessment, as called for in General Assembly resolution 57/141.

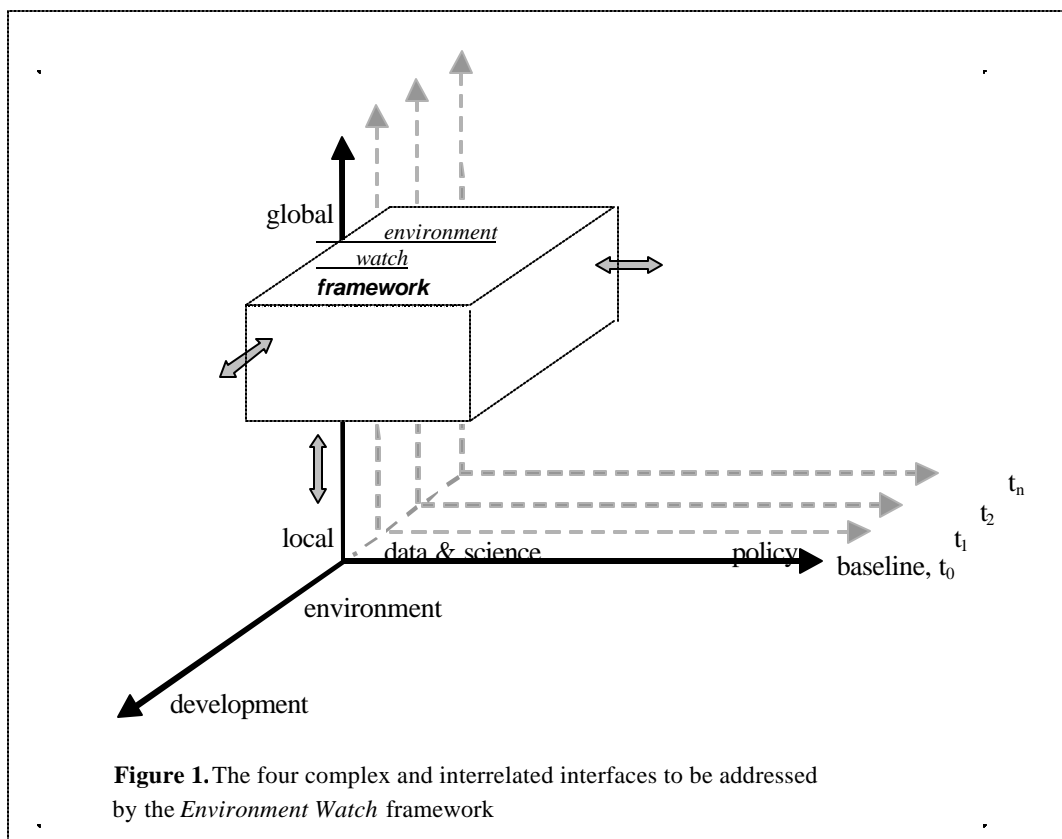
¹³ The World Water Development Report.

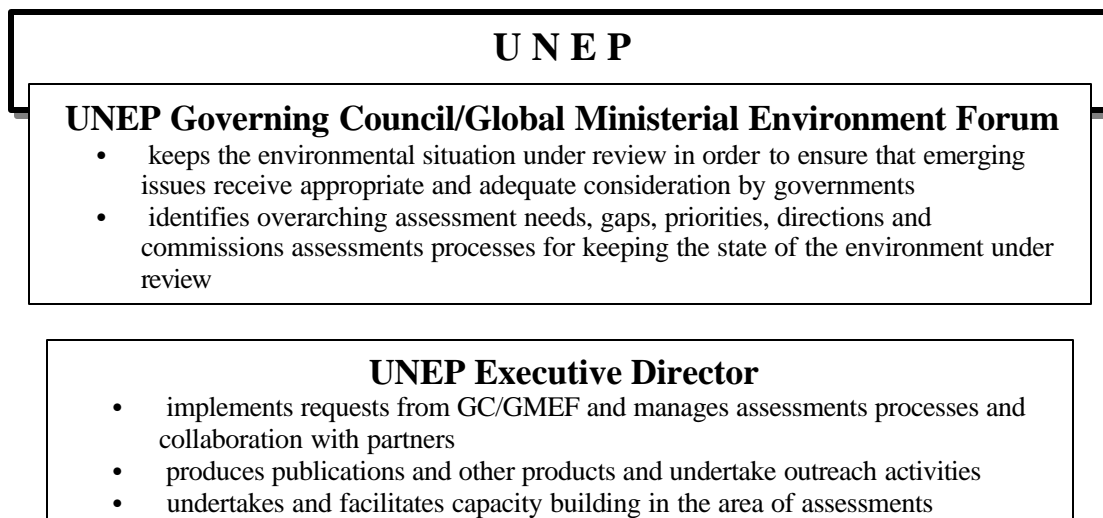
¹⁴ GEF Land Degradation Assessment programme (LADA), Global Forest Resource Assessment (GFRA), Global Land Cover Network (GLCN), and the International Assessment of Agricultural Science and Technology for Development (IAASTD).

and targets. The framework would, however, only be useful if it contributes to strengthening the interface between science and policy and facilitates a mechanism to ensure that emerging issues are considered and acted upon by governments and civil society representatives.

(b) Who will use an *Environment Watch* framework? The *Environment Watch* framework will be developed under the auspices of the Council and Forum. UNEP has since its inception leveraged support for a wide ranging set of collaborative processes for collection, management, compilation, analysis and sharing of data and statistics, and its activities on monitoring, networking, indicator development, assessment, and early warning at different spatial scales. A large number of actors including Governments, international organizations, local authorities, scientific community and representatives of civil society are active in keeping the environment under review and acting upon its findings. Governments will use the conceptual elements, approaches and tools of the framework in fostering both national action and international cooperation. The framework will be important for streamlining UNEP's own activities and promoting its cooperation with its many existing partners in the field. The partners may themselves find the framework useful in enhancing their own activities and processes and linking with other actors in the field.

(c) Will an *Environment Watch* framework work? It seems clear that a framework built on a generic operational component and a modular component is reflecting the development in the current activities undertaken for keeping the state of the world environment under review. The GEO process, for instance, has itself evolved into a modular approach under one conceptual framework. Parallel examples can be drawn from other assessment processes such as the Millennium Ecosystem Assessment, whose components are also characterized by their thematic and geographical scope organized under one conceptual and operational umbrella. The same is the case for the global observing systems. The *Environment Watch* framework could be seen as a further manifestation of these developments. However, the framework will only work if it is seen as legitimate by the various actors in the field and recognized as contributing intellectually to advancing their work. A prerequisite for a workable framework is that it is developed through an inclusive and transparent intergovernmental and stakeholder consultative process. The framework would make it easier for all actors to orient themselves in the practical and conceptual landscape, would foster cooperation, and make it easier to establish and maintain universal support structures for keeping the environment under review.





The Environment Watch Framework

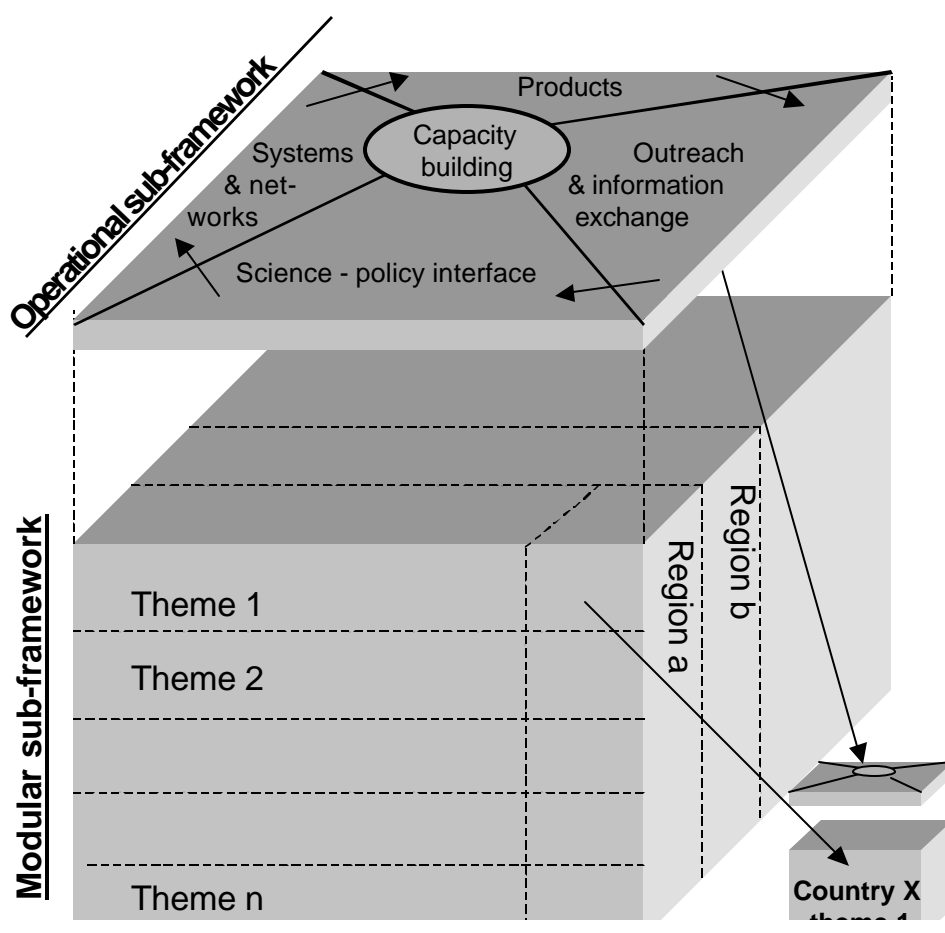
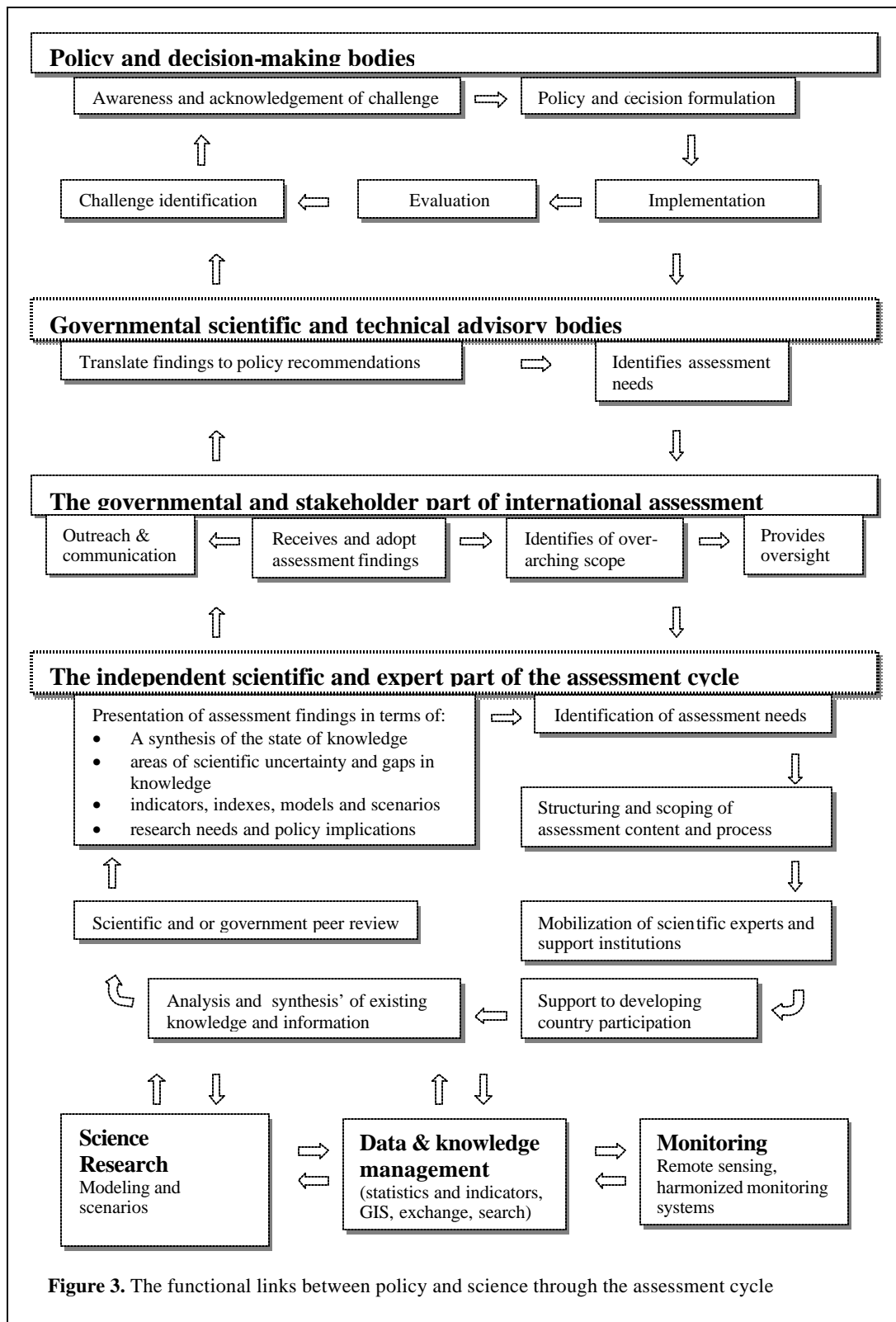


Figure 2. The context and components the Environment Watch framework



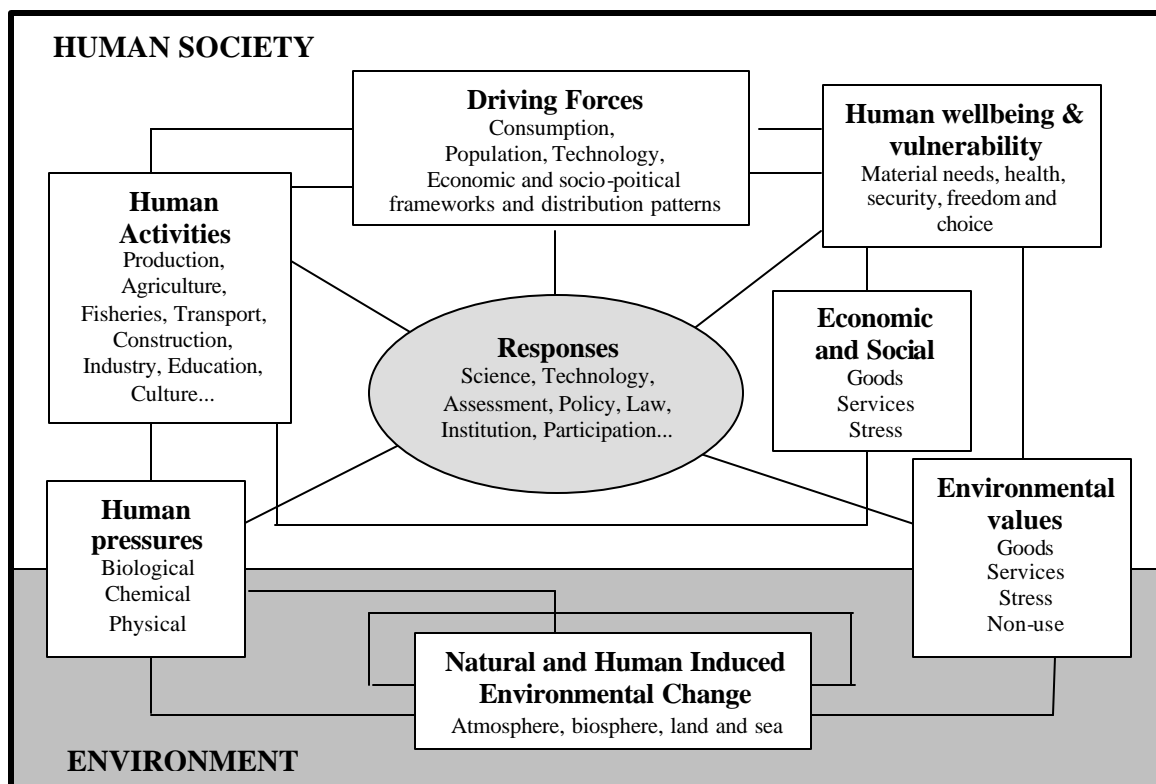


Figure 4. The UNEP human - environment interaction conceptual approach

Annex III

Revitalizing networking structures for environmental knowledge in support of the *Environment Watch* framework¹⁵

“Knowledge is an asset that grows when shared”

A. Background

54. The intergovernmental consultation on strengthening the scientific base of UNEP, held in Nairobi on 14–15 January 2004, identified a number of important capacity-building needs, such as the need to strengthen national capacities for data collection, research, analysis, monitoring and integrated environmental assessment; developing institutional capacities, staff training, the transfer of appropriate and adaptable technologies and methodologies; support for assessments of environmental issues of regional and subregional importance, as well as for the assessment and early warning of emerging environmental issues, and promotion of coherent partnership approaches.

55. This annex presents a strategic plan for focal point and network harmonization at the national level as the basis for higher level networking structures. It reviews disparate networking activities and associated focal points, examines the mandates underpinning their existence and, consequently, UNEP’s engagement with national-level partners in the area of environmental assessment, data and information. Finally it proposes a fresh approach towards revitalizing information networking structures for consideration by the UNEP Governing Council and Global Ministerial Environment Forum. A sound and stable networking structure is necessary to underpin the operational framework of *Environment Watch*.

B. Historical background and problem definition

56. Over the past three decades UNEP has spawned a number of environmental information networking activities, the Environment and Natural Resources Information Networking (ENRIN), the Global Environment Outlook (GEO), the Global Resource Information Database (GRID), the Global Environmental Information Exchange Network (Infoterra) and, lastly, the Africa Environmental Information Network (AEIN), which have stakeholder involvement at the global, regional, subregional and national levels. All these networks deal with some aspect of environmental data and information from collection and management through to access, exchange and dissemination, though not necessarily in all countries. Although having different points of departures, these initiatives have, over the years, evolved into a situation where they are, to some extent, overlapping in terms of activities, working with different institutional partners in the same country and sometimes working with different people within the same institution. The following is a brief overview of each network.

1. ENRIN

57. ENRIN is a capacity-building programme for better state-of-the-environment (SOE) reporting at the national level. In each country, ENRIN has operated through a small network of institutions that are stakeholders in the national SOE reporting process. The objective is to build capacity in these institutions to undertake environmental assessments and ultimately produce better national SOE reports. ENRIN has been coordinated on a regional basis through outposted UNEP programme officers responsible for environmental assessment, data and information. Currently, ENRIN is active only in the Eastern Europe, Caucasus and Central Asia region. Capacity-building for better environmental assessment, however, is undertaken in Africa, Latin America and the Caribbean, Asia and the Pacific and West Asia under the DEWA programme.

¹⁵ Based on experiences derived from existing networking activities and looking towards a restructured approach in partnership with Governments and other stakeholders.

2. GEO

58. UNEP has established a relatively small global network of 34 collaborating centres, mainly non-governmental organizations, that have a critical role to play in the production of the GEO series of reports. Some of these institutions are GRID centres, Infoterra National Focal Points (NFPs) and ENRIN collaborators while others are non-governmental organizations, intergovernmental organizations, governmental agencies, universities and centres of excellence in specialized areas. Their main responsibility is to contribute region-specific and thematic input to the GEO reports and engage in regional and subregional environmental assessment processes. The collaborating centres are coordinated by UNEP on a regional basis. Regional, subregional and national GEO reports are also produced in the regions using extended networks of centres and supporting Governments.

3. GRID

59. GRID is a small, global network of approximately 13 institutions (governmental, non-governmental and academic) that are centres of excellence in remotely sensed data gathering and have geospatial capability to manage this data. In general, the responsibilities of the GRID centres are to analyse remotely sensed data, compile global data sets and provide technical information support to regional and global assessment processes. The centres did not have a common set of terms of reference and this resulted in considerable disparity of activities among them. Some centres were project-oriented at a site-specific level while others genuinely tried to focus on global issues and support UNEP's global assessment programme. The GRID network was formerly coordinated through a Programme Activity Centre based at UNEP headquarters but, after 1995, the GRID centres tended to operate independently, although three (Geneva, Sioux Falls and Bangkok) were coordinated by UNEP.

4. Infoterra

60. Infoterra is a global network of 177 Government-designated national focal points located mainly in the information departments of environment ministries and environmental protection agencies. The traditional responsibilities of these NFPs were: to operate a publicly accessible environmental information centre; identify institutional sources of data and information for UNEP; develop environmental terminology; respond to queries for scientific and technical information on environmental matters; organize awareness-raising workshops; and facilitate the exchange of environmental information among countries. At present, the national focal points in approximately 40 countries might warrant reconsideration in terms of whether they are based in the most relevant institution. In addition, in many countries the national focal point manager is not designated at a senior decision-making level. The Infoterra network was formerly coordinated through a Programme Activity Centre based at UNEP Headquarters. This coordination unit was downsized to a smaller unit under subprogramme one, environmental assessment and early warning, during the mid-1990s due to financial constraints in UNEP.

5. AEIN (Africa Environmental Information Network)

61. AEIN is a network of 13 African countries which has evolved in response to political and technical needs expressed by the African Ministerial Conference on the Environment (AMCEN) at its ninth session, in 2002. A central objective of AEIN is to build capacity for establishing the essential data foundation and information-management framework needed to support country-level integrated environmental assessments and reporting, within the broad framework of sustainable development goals and initiatives. A specific objective is to support the Africa Environmental Outlook (AEO) process while strengthening capacity for SOE reporting at the national and subregional levels.

62. The significant reduction of the environment fund of UNEP in the mid-1990s led to a downsizing of a number of programme activities, including the dissolution of three Programme Activity Centres – GEMS/PAC, GRID/PAC and Infoterra/PAC – that constituted UNEP -Earthwatch. This left formal networks of partners working in relative isolation from UNEP's programme of work in the area of environmental assessment, early warning and data and information exchange. As a result, considerable momentum was lost, including at the national level with governmental partners. No resources were available for a systematic analysis of partner functions as the basis for a strategy to consolidate and revitalize networking activities in the area of environmental assessment, data and information. A small network of 34 GEO collaborating centres, mainly non-governmental, was established to support the production of the GEO report. Very few ENRIN, GRID or Infoterra partners

were engaged in the GEO process. The ENRIN capacity-building project nominated NFPs, many of which overlapped with Infoterra NFPs, though the functions were different.

63. Collectively, these disparate networks had a somewhat piecemeal and not fully coordinated approach towards addressing a wide range of national-level data and information problems that have a significant impact on the quality of delivery of the assessment programme of work. The following is a non-exhaustive list of various national level issues to be addressed:

(a) No formal coordinating institutional framework is in place to govern holistically the management of environmental information and no formal instruments are available for exchange of environmental data. Whenever information is needed for decision-making the data has to be gathered collected and systematically interpreted on an *ad hoc* basis (for example, preparation of SOE reports through *ad hoc* committees. Projects related to data management and data networks are donor-driven, not sustainable and end once funding stops;

(b) In countries where timely and reliable environmental data and information does exist, it tends to be scattered across different institutional suppliers and custodians who tend to work independently in response to different mandates (Millennium Environmental Assessments, for example) and in the absence of a coherent environmental assessment infrastructure. This is compounded by the fact that little internal (intracountry level) networking is carried out, or where it is, no data-flow methodology is coordinated by a single entity;

(c) Where sound collection systems are in place, there is a tendency to generate too much data, some of which is not relevant to national environmental reporting requirements or is of inadequate quality to be used by policy-makers;

(d) Methods of measurement of environmental data are often not harmonized and at a technical level there is no agreement on common environmental terminology, data harmonization, data standards, data-exchange protocols, structured metadata, etc. Standards such as the Dublin-core and high-level data models need to be introduced and made available to all participating countries;

(e) Capacities vary among countries with respect to the acquisition, verification and dissemination of georeferenced environmental data sets and the provision of access to geographic information systems and expertise for supporting environmental assessments. Spatiotemporal data exists in most countries but is not harmonized in such a way to enable real-time, on line dissemination through advanced tools such as map servers;

(f) In some countries, objective, reliable and comparable environmental data is not being generated or is not being collected systematically due to inadequate or non-existent monitoring programmes;

(g) There is inadequate capacity of institutions in developing countries and countries with economies in transition to analyse, interpret and summarize data in order to draw inferences on the quality of the national environment and provide early-warning alerts;

(h) Weak linkages often exist between national environmental institutions and scientific institutions involved in research highlighting emerging environmental issues that have an impact on SOE reporting priorities. Agreements between information and data providers are needed to develop these links;

(i) Access to reliable environmental data and information to facilitate decision-making at all levels and for the public good is often inadequate and measures in place tend to be reactive rather than proactive, which is not in keeping with the spirit of Principle 10 of the Rio Declaration on Environment and Development;

(j) Lack of cooperation between institutions in adopting new technologies in order to share data based on common metadata standards, protocols and terminologies is a universal problem;

(k) Reactive rather than proactive environmental communications with the user community pose a problem. Broad-based dissemination of environmental information, including reports from UNEP, is not coordinated well or formalized at the national level;

(l) The level of access to modern information and communication technologies and associated training varies significantly in developing countries and countries with economies in transition;

(m) A lack of focused understanding among information providers of user needs and requirements results in a general tendency to provide information in forms and formats that represent either what institutions think users require or take the easy option on what is practical to deliver. Consequently, there are often unclear or very broad objectives in delivering environmental information and, even if there is the will, without an objective the success of any initiative cannot be measured;

(n) An environmental information service is still seen as a non-quantifiable social service in many countries, has a very low priority rating in national budgeting and, in the face of competing demands, has a low probability of receiving adequate funding in the national budgets of many countries.

6. Conclusion

64. Any new strategy to harmonize disparate networking initiatives must be based on a functional approach that recognizes and addresses the aforementioned national-level problems:

7. Proposed action

65. Restructure UNEP's networking approach at the national level in consultation with Governments and put in place an agreed functional structure that addresses these problems in a holistic manner under the proposed *Environment Watch* framework.

C. Synopsis of mandates governing national focal points and networking

66. Within UNEP, subprogramme one on environmental assessments and early warning, as implemented by the Division of Early Warning and Assessment, is the key vehicle for implementing the General Assembly resolution 2997 request to the Governing Council to keep under review the world environmental situation and, *inter alia*, to promote the contribution of the relevant international scientific and other professional communities to the acquisition, assessment and exchange of environmental knowledge and information and, as appropriate, to the technical aspects of the formulation and implementation of environmental programmes within the United Nations system.

67. The only reference to the establishment of national (and regional) focal points is to be found in decision IV of the second meeting of the Governing Council (1974). This decision, which, in reference to the International Referral System, *inter alia* instructs the UNEP Executive Director to take preparatory action in consultation with Governments to establish a network of national and regional focal points set up by Governments wishing to participate in the system. The decision further authorizes the Executive Director to provide assistance as appropriate to facilitate the participation of developing countries.

68. This decision was supplemented by various decisions endorsed by subsequent sessions of the Governing Council. In summary, these decisions:

- (a) Called on countries to appoint NFPs;
- (b) Requested that developing countries have free access to environmental information;
- (c) Decided on funding allocations within assessment subprogramme (60 per cent for monitoring and assessment; 40 per cent for information access and exchange);
- (d) Called for the reform (decision 20/5) of the Infoterra network to ensure better public access to environmental information.

69. Decisions on GRID date back to the sixteenth session of the Governing Council (1991), when decision 16/25 established the GRID Programme Activity Centre and set out short- and long-term goals aiming towards a fully integrated and functioning United Nations-based core GRID system of cooperating agency and national centres, openly exchanging environmental data and information and providing the necessary information management support to bridge the gap between the generation and the use of environmental data. The decision also set out two important priorities:

- (a) The acquisition, verification and dissemination of georeferenced environmental data sets, as well as the development of methodologies for handling global and regional data; and
- (b) The provision of access to geographic information systems and expertise for supporting environmental assessments and practical environmental problem-solving at all levels.

70. Although there is no decision supporting GRID focal points, there is reference to a GRID network as a long-term and somewhat ambitious goal whereby all major global and regional environmental databases are to be made more effectively available through the GRID network. Such accessibility is to be in appropriate forms for a wide range of users, from students to scientists to politicians. At present, it can be argued that this is also a major goal of UNEP.Net in its new role as an electronic information discovery mechanism.

71. There are no Council or Forum decisions related to the establishment of an ENRIN network or associated focal points, but the ENRIN budget is mentioned in a few decisions.

72. With respect to the GEO network of collaborating centres, there are no specific Council or Forum decisions on designating GEO NFPs, collaboration with Governments, United Nations agencies and bodies, but collaborating and associated centres and experts are invited, however, in decision 20/1, (1999) to participate in the production of the GEO -3 report.

73. The AEIN is supported by decision 22/9 (2003) which, *inter alia*, requested the Executive Director to support the regular production of the Africa Environment Outlook report and the establishment of the Africa Environment Information Network, as called for by the ninth session of the African Ministerial Conference on the Environment.

1. Conclusion

74. From a historical perspective the Council decisions governing NFPs and networking do not, as they currently stand, amount to a holistic approach that fully captures the provisions of United Nations General Assembly resolution 2997. Further, they do not establish an integrated networking structure that supports the implementation of resolution 2997 from national up to global level.

2. Proposed action:

75. UNEP should present a draft decision to the Governing Council at its twenty-third session to obtain a revised and clear mandate that will lead to the reorganization and consolidation of UNEP's networking structure at the national level, and establish the foundation for effective networking at the subregional, regional and global levels to support the operational framework of *Environment Watch*.

D. Synopsis of current situation with respect to focal points and network partners

76. UNEP has undertaken a mapping of all contact points for environmental assessment, data and information in the six regions covered by UNEP's regional offices. An overall networking characteristic across all regions is that there are often multiple contact points in the same environmental authority, but at different levels from the political down to the programmatic, and often for different functions ranging from data collection and remote sensing through to assessment, reporting and information exchange. For example, in West Asia, the NFPs are at two levels within environmental authorities – head of agency or ministerial level, and at departmental level for Infoterra NFPs. Clear guidelines are therefore needed on communication processes at the political and programmatic level. The Infoterra network has the most extensive global coverage, with 177 participating countries with NFPs officially designated by Governments. In Europe, there is extensive overlap between ENRIN and Infoterra contact points. In Africa, the ABN NFPs and Infoterra NFPs have minimal overlap in the 13 countries where AEIN is operational, and this projects an uncoordinated image of UNEP's national-level engagement in the region. In addition, formal and informal NFPs and networks exist for a number of multilateral environmental agreements and other international environmental instruments. A consolidated UNEP network must interact with those contact points.

1. Conclusion

77. UNEP has multiple points of entry at the national level, both across institutions and within the same institution, because it has disparate networks. Countries do not have a holistic view of UNEP's current assessment programme activities at the national level. The communications process is not coherent and, as a result, coordination is not effective.

2. Proposed action

78. UNEP needs to work with those institutions that are authoritative sources of relevant and reliable data and information on environmental issues in order to support assessment, reporting, early-warning and information-exchange activities. UNEP needs to project one coherent networking structure in each country in order to promote concerted actions by the multiple networking initiatives. One national point of contact in each country is therefore highly desirable for effective communication

and coordination of the proposed *Environment Watch* programme activities and streamlining of networking structures to underpin the operational framework of *Environment Watch*.

E. Towards a new environmental information networking structure and proposed institutional arrangements at the national level

79. In order to enhance the delivery of UNEP's mandated and approved assessment programme of work, there is a need to strengthen and mobilize working relationships with relevant national partners. The aim, therefore, is to work in partnership with Governments to implement a coherent networking structure that supports the national-level implementation of the *Environment Watch* framework with effective collaboration among relevant stakeholders to implement a workplan that addresses the following challenges:

- (a) Build cooperation among key institutional suppliers and custodians of environmental data and information, particularly MEA data providers, so as to establish the framework by which UNEP, United Nations Member States and Governments are provided with the best available information for environmental reporting, policy formulation and decision-making;
- (b) Strengthen linkages between national environmental institutions and scientific institutions involved in research so as to identify and highlight emerging environmental issues that can subsequently impact SOE reporting priorities;
- (c) Harmonize the collection and sharing of environmental data (including georeferenced information) in accordance with approved international standards (ISO 11179, ISO 19115, TC 211, FGDC, Dublin Core, Darwin Core, and the 191nn family of standards) for environmental terminology, data standards, data exchange protocols, and structured metadata;
- (d) Build capacities of institutions in developing countries and countries with economies in transition to collect, analyse, interpret and summarize relevant data in order to draw inferences on the quality of the national environment and provide early-warning alerts;
- (e) Facilitate access to reliable environmental data and information to facilitate decision-making at all levels in keeping with the spirit of Principle 10 of the Rio Declaration on Environment and Development. In this context, the development of a national environmental portal is seen as a sound initiative which would facilitate cooperation between partners for information-sharing and public access.
- (f) Facilitate the broad-based communication and dissemination of environmental information from national sources, including reports from external sources such as UNEP, other United Nations agencies and international environmental organizations;
- (g) Contribute to UNEP's information- and data-sharing initiatives, principally UNEP.Net, but also to other information and data initiatives across various programme areas; and
- (h) Promote access by developing countries and countries with economies in transition to cutting-edge information and communication technologies in order to empower them to implement the above objectives.

80. Given the breadth and depth of the above — non-exhaustive — list of challenges, UNEP must work through a unified network structure in each country under which collaboration between institutional players is mobilized in partnership with Government. The national implementation of *Environment Watch* in response to the above objectives will require agreement on roles and responsibilities for the organization of a national programme of work with shared responsibility and accountability between partners.

1. Proposed action

81. Design, develop and implement a new model for environmental information and data networking at the national level. The model proposed for this framework is a two-tiered one comprising:

- (a) A Government-designated National Focal Point (NFP) based in the principal environmental authority with responsibility for SOE reporting; and

(b) A national environmental information network comprising a small number of key institutions coordinated by the National Focal Point and implementing an agreed national programme of work.

82. This national network structure for Environment Watch should, ideally:

- (a) Be endorsed by a Council and Forum decision;
- (b) Be formally established, possibly through a partnership agreement;
- (c) Comprise key institutions that are authoritative national reference centres with the expertise to handle both multi-functional and multi-thematic aspects of environmental data and information;
- (d) Be recognized and accepted as UNEP's principal environmental information network in each country;
- (e) Be coordinated through a workable mechanism established by each country, taking into account national environmental governance structures and related factors;
- (f) Organize a national set of activities possibly through a programme of work under the *Environment Watch* framework;
- (g) Have a clear and formally agreed communication process with UNEP at both the policy level and the programmatic level; and
- (h) Act as a two-way channel for the exchange of information between UNEP and its partners in each country.

83. The NFPs and the network they constitute would include regional nodes and relate to relevant existing regional networks and networking initiatives. It is recommended that a guideline outlining the functions of the national focal points and the network should be developed through intergovernmental and stakeholder consultations as part of the *Environment Watch* framework, *inter alia*, building on the elements above.

84. This model is similar to the European Environment Information and Observation Network (EIONET) operated by the European Environment Agency (EEA) but goes farther. Within the EIONET framework, an NFP in each member country coordinates SOE reporting inputs and data flows from a small network of thematic centres of excellence that cover the five Dobbris Assessment reporting themes. However, EIONET has only one non-thematic reference centre, for information and communications technology.

85. The national network structure recognises the reality of environmental data fragmentation across different institutional custodians that probably need to cooperate more effectively both among themselves and also in partnership with UNEP. A substantial amount of environmental data reporting is done under the multilateral environmental agreements, but this often takes place in relative isolation from the main SOE reporting process and needs to be more integrated within countries. In selecting the members of the national network, due attention should be paid to priority thematic issues of national importance. For example, if the country is a party to the Convention on Biological Diversity (CBD) then the information clearinghouse node for CBD should be a member of the network with responsibility for biodiversity data, and ideally, should also be sharing those data globally through the Global Biodiversity Information Facility (GBIF), which in turn should be discoverable through UNEP's environmental gateway UNEP.Net.

86. Interlinkages with the main international and regional environmental organizations and convention focal points and clearinghouse nodes should be maintained, as well as with other information systems regarding more general or specific environmental information systems, such as GBIF. In some regions, such as within the EU region, including new EU member countries, coordination and cooperation is essential as a result of the reporting obligations of all member States. This is also in keeping with UNEP's policy to promote synergies between multilateral environmental agreements and more streamlined environmental data reporting at the national level, and is an important first step towards building such collaboration.

87. Furthermore, the national network structure is also flexible enough to include institutions that have as their primary goal information and data dissemination against identified needs and requirements, rather than monitoring and data collection. In this respect, the participation of non-governmental and scientific institutions should be encouraged as it is in keeping with UNEP's

strategy for non-governmental organization and civil-society engagement. In some developed countries where sophisticated information and communication technologies are commonly used, the national network may operate almost as a virtual network of institutions engaged in information-sharing through a set of interoperable web services.

88. A set of guidelines for the designation of the NFPs and the functions of the national network will be developed in consultation with Governments and other stakeholders. The national network structure will ensure that institutions that are part of other networks are not orphaned but remain within the fold of the national network family, possibly with special responsibilities, within the national network, for *Environment Watch*.

89. In undertaking this task, these institutions must work in a coherent and coordinated manner, in effect operating as one integrated national environmental network under the aegis of UNEP's *Environment Watch* framework. National network-management procedures will be formulated and implemented by each NFP in consultation with its own constituent members. The national network concept may be customized and adopted to suit local conditions, cultures and administrative structures, for example, federal systems.

90. However, it is expected that the national reference centres (NRCs) would fall into two broad categories:

- (a) NRCs having a thematic responsibility with embedded multi-functional dimensions; and
- (b) NRCs having a functional responsibility with embedded multi-thematic dimensions.

91. Typical broad themes may include:

- (a) Water quality, freshwater resources and drinking water;
- (b) Air quality, atmosphere, climate change and ozone;
- (c) Natural disasters;
- (d) Transport and urban infrastructure and cities;
- (e) Forests;
- (f) Marine and coastal zones;
- (g) Biodiversity, conservation and protected areas;
- (h) Wastes, chemicals and pesticides;
- (i) Land cover, soils and deserts; and
- (j) Agriculture and food security.

92. While it is accepted that not all themes will apply to every country, a high degree of commonality is expected and the data flows associated with these themes should feed directly into the construction of national environmental indicators, form the basis for further aggregation of indicators at the regional and global levels and support assessments at these levels. These themes are linked closely with the GEO Yearbook indicators.

93. Typical functions that cut across thematic areas may include:

- (a) Environmental policy analysis, scenario modelling, socio-economic linkages;
- (b) Sustainable development planning and natural resource use;
- (c) Environmental research and linkages with the scientific community;
- (d) Civil-society engagement and linkages with the community of non-governmental organizations;
- (e) Environmental communications, information access, sharing and dissemination; and
- (f) Mapping, remote sensing, observing, and georeferenced data.

94. Assuming N themes and M functions, the national network structure gives an N x M matrix of thematic-functional nodes that define specific tasks (e.g., mapping forest cover, analysing waste management policy or disseminating biodiversity information). From the viewpoint of working relationships and interactions among institutions and individuals, the resulting synergies are much

higher according to Metcalf's law, which states that the "value" or "power" of a network increases in proportion to the square of the number of nodes on the network.

95. National network coordination and oversight is vital for the effective implementation of *Environment Watch*. UNEP should be responsible for the provision of advisory services, tools and methodologies at global and regional level in close cooperation with regional environmental ministerial bodies, their technical support structures, and their existing networking structures and initiatives. The management and implementation of *Environment Watch* at the national level is the responsibility of Governments. Ideally, the NFP will be based in the principal environmental authority (Ministry or agency) within each country and will typically form the nucleus of a national environmental information centre that has oversight for environmental assessment, data management (including geospatial), reporting, information access and exchange.

96. The capacity-building programme that lies at the core of the operational framework of *Environment Watch* will aim to strengthen the institutions participating actively in the national environmental information network. This will be done within the framework of UNEP's Intergovernmental Strategic Plan for Technology Support and Capacity-building, which is still under development.

97. Within the proposed networking structure, the NFP will be responsible for the following, non-exhaustive, list of functions:

- (a) Identifying and selecting the members of the national environmental information network in an open and transparent way;
- (b) Liaising with national network members on the planning, implementation and reporting of the national programme of work for *Environment Watch*;
- (c) Maintaining communications with the UNEP regional office coordinator on operational matters such as national work programme planning, implementation and reporting;
- (d) Identifying priorities for capacity-building;
- (e) Transmitting information supplied at the national level to UNEP, including strategic information on emerging threats (early warning) and issues that may warrant an intervention by UNEP;
- (f) Disseminating information from UNEP to national network partners;
- (g) Responding to *ad hoc* requests from UNEP for national input to strategies, plans, policy papers, project concepts and miscellaneous programme activities within the framework of UNEP's programme of work.

98. The national programme of work will be country-driven within the overall framework of *Environment Watch*. However, certain core functions and activities will probably be common to all countries, for example, to:

- (a) Keep the national environmental situation under review by undertaking regular assessments;
- (b) Provide feedback on *Environment Watch* implementation to the political focal point (via the NFP);
- (c) Assist with sourcing funds to support the network's activities;
- (d) Determine who is collecting environmental data and in response to which mandate;
- (e) Ensure that the information needs of user groups are identified and serviced;
- (f) Forge links with the scientific and non-governmental community;
- (g) Promote the identification of user requirements for information;
- (h) Transform best available data into information that meets identified user needs;
- (i) Ensure that relevant and reliable data and information is made available and accessible through electronic and non-electronic mechanisms;
- (j) Maintain an inventory of environmental assessments;
- (k) Develop a country environmental portal;

- (l) Develop and implement an environmental communications strategy and disseminate information to various user groups;
- (m) Organize a regular environmental forum involving network partners and major user groups;
- (n) Raise environmental awareness in general;
- (o) Publish a national environmental information newsletter;
- (p) Promote UNEP within the country;
- (q) Mobilize network partners to contribute to UNEP.Net development; and
- (r) Oversee national data and information accessible through UNEP.Net.

99. This core list of functions and activities should not deter certain countries with advanced information and communications infrastructures from implementing more sophisticated approaches for information access and data exchange, such as:

- (a) Real-time on line data-dissemination tools; and
- (b) Widely distributed web services networks.

F. Networking at the global, regional and subregional levels

100. This issue is somewhat beyond the scope of this paper, but a country -by-country review of partner organizations will simultaneously identify those partners that are operating above the national level, and these organizations need to be classified as subregional, regional or global partners. At these levels, only those organizations which have a mandate that extends beyond national boundaries can, realistically, be included in a networking initiative that is supra-national in scope. Any global, regional or subregional networking initiative established by UNEP or regional organizations should be based on the “building blocks” of the national structures and be supported by effective coordination mechanisms that have political endorsement at the relevant level (e.g. AMCEN’s endorsement of AEIN). This bottom-up approach ensures that national institutions participating in *Environment Watch* can take their expertise and experience to a higher level and share it with other national structures and regional organizations to support the implementation of modular framework of *Environment Watch* beyond the national level.

101. From a thematic perspective, any national reference centre responsible for a given theme can be vertically integrated into a thematic network which covers that theme at the subregional, regional or global level. The Food and Agricultural Organization of the United Nations-UNEP joint coordination of the Global Land Cover Network (GLCN) is a case in point. The objective of GLCN is to achieve a global harmonized database on land cover, the most fundamental database for monitoring of environment and sustainable development. Through regional, subregional and national training workshops GLCN is building the capacities of relevant national institutes and experts to assess and monitor status and trends of land cover. GLCN does this by providing the remote-sensing land -cover data (presently, United States National Aeronautical and Space Administration data sets for 1990 and 2000) and a scale- and user-independent Land Cover Classification System (LCCS2) for harmonized land-cover assessment with appropriate software and training. Again, thematic networking will also support the implementation of the modular framework of *Environment Watch* at higher levels of aggregation. Another aspect to be considered is the analysis, synthesis and interpretation of national data to support reporting at higher levels in the *Environment Watch* framework, and suitable mechanisms need to be put in place to address this task.

102. From a global perspective, the new network structure is, in effect, a network of networks and there are obvious synergies to be gained by countries and individual institutions from their participation in such a structure, which spans thematic and geographic boundaries with respect to environmental data and information management.

G. Outline of the planned harmonization process for environmental data and information networking

103. The harmonization process will be comprised of three distinct phases:

1. Phase 1 (pre -GC.23) – Consultation, network redesign and transition planning

104. This annex has been distilled from a strategy paper on network harmonization and revitalization which was circulated globally to a subset of existing networking partners for review and comment. Overall, the response received has been very positive and salient comments have been incorporated in this annex.

105. In any transition process which potentially has a significant impact on established partnerships, it is important to plan and manage the communications process carefully so that there is no misunderstanding of UNEP's strategic approach and the reasons behind the need for a new way of doing business.

2. Phase 2 (post-GC.23) – Transition to the new network structure

106. Based on the considerations of the issue at hand by GC.23/GMEF, several actions will need to be considered:

(a) The development, through intergovernmental consultation, of guidelines for NFPs on, *inter alia*, national network planning and management, and work programme activities;

(b) At the regional level, it will be important to initiate and maintain direct communications with the NFP in order to promote and support the implementation of the guidelines. In Europe, the European Environmental Agency member countries and accession countries may wish to nominate the existing EIONET NFPs. It may be necessary for these NFPs to identify additional national reference centres for specific functions and themes that are of interest to UNEP in the region; and

(c) An electronic system of Internet listserves will be established to maintain communications with both political and national focal points, and national networks.

3. Phase 3 (GC.24 and post-GC.24) – Fully operational network structure

(a) A report on the implementation of the decision could be prepared by UNEP and submitted to the Governing Council at its twenty-fourth session, in 2007.

(b) Countries which have implemented the new structure may wish to report on progress and lessons learnt and share them with other member States;

(c) The implementation process will be continuously reviewed and fine-tuned. An independent external evaluation could be conducted in 2008.

107. Within each region, the UNEP regional coordinators for *Environment Watch* will be responsible for providing backstopping support to the implementation of the process in each country. Overall coordination and oversight of the network restructuring process globally will rest with UNEP Headquarters so as to promote inter-regional cooperation, including sharing of experience on the widest possible scale.

Annex IV

Environmental indicators

A. Background

108. One of UNEP's fundamental mandates is to keep the state of the global environment under review. It does this through a number of initiatives, including the Global Environment Outlook (GEO) report series. The three global reports published to date – GEO-1 (1998), GEO-2000, and GEO-3 (2002) – have reported on the state of the world's environment through thematic, qualitative appraisals of key environmental issues and trends, analysis of relevant socio-economic driving forces, and assessment of policy responses in all regions of the world. These reports have provided Governments and other readers with valuable information about environmental conditions and the effectiveness of policy measures in achieving sustainable development. The reports also provide guidance for future action.

109. Environmental assessments and state-of-the-environment (SOE) reporting is a constantly evolving and growing field which reflects the numerous, different conceptual approaches in play. SOE reporting is evolving towards more user-defined approaches, using a large number of indicators to address fewer issues. Indicators help translate complex data into comprehensible information and are frequently aggregated to show progress towards a target. The reporting products are generally shorter and more concise than traditional comprehensive and lengthy environmental reports. The dominant trend in SOE reporting has been towards more focused indicator reports for different audiences.

B. Indicators

110. The packaging of data into indicators as defined in Box 1 below is a way of simplifying complex and detailed information. The purpose of indicators is to quantitatively determine what is qualitatively suspected. Indicators must be designed in a way that allows us to set precise goals for future actions and then enables Governments and civil society to monitor progress towards the desired goals. Indicators also assist in identifying those forces which contribute towards improvement or degradation of economic, social, environmental and other conditions. Criteria for selecting environmental indicators are given in Box 2 below. Indicators are the most basic tools for analysing change in society, and therefore are superior to data as an analytical tool for several reasons:

- (a) By presenting several data in one single number, they can facilitate communication between different groups;
- (b) By providing information on trends of sustainable development, they can provide the input for policy formulation processes;
- (c) Indicators can be used at international and national levels in state-of-the-environment reporting, measurement of environmental performance and reporting on progress towards sustainable development; and
- (d) They can also be used at national levels in planning, clarifying policy objectives and setting priorities.

C. Recent trends in indicator development

111. Following the Rio Conference on Environment and Development in 1992, there has been a proliferation of activities related to the development of sustainable indicators. Numerous international, regional organizations, governmental agencies and scientific bodies have launched a variety of environmental indicator initiatives encompassing different areas of environment. While data are the most basic component of indicator work, the lack of data, especially reliable time-series data, is a common problem when dealing with indicators. Furthermore, many environmental indicators are being proposed. In fact, there are more proposed indicators than the number of data variables being measured.

112. The basic issue is not only constructing indicators but also articulating what these indicators indicate, and making those indicators accessible and understandable to policy-makers and to the general public. Until such time as this challenge is met, there will always be too many indicators and too little action.

113. However, in recent years, the trend seems to be shifting towards development of a few indicators, as reflected by the 10 Indicators for Environment by the Organisation for Economic Co-operation and Development (OECD), Headline Indicators by the European Environment Agency (EEA) in Environmental Signals and by the similar approach by the Canadian National Round Table on the Environment and Economy (NRTEE). Within the United Nations system, a major paradigm shift has taken place as a result of the Millennium Development Goals (MDGs).

D. Indicators for MDGs and the WSSD Plan of Implementation

114. A framework of 8 goals, 18 targets and 48 indicators to measure progress towards the Millennium Development Goals was adopted by a consensus of experts from the United Nations Secretariat and International Monetary Fund, OECD and the World Bank. UNEP has been regularly contributing towards the MDG indicators as an input to the United Nations Secretary-General's report to the General Assembly through the interagency expert group on MDG indicators.

115. Although environment as a crosscutting theme influences several MDGs, its significance in the MDG framework is prominently highlighted in MDG7: Ensuring Environmental Sustainability. MDG 7 is divided into three targets:

- (a) Reversal of natural resource degradation and emphasis on sustainability principles;
- (b) Access to safe drinking water; and
- (c) Slum improvement (see table 1, below).

116. MDG 7 addresses important environmental issues by looking at the interaction between the environment and the other two components of sustainable development, the economic and social components. The goal deals with the loss of natural resources and the impact of the economy on the environment. These impacts result from the diminishing ability of the environment to provide materials (e.g., timber and non-timber products and energy resources) and to serve as a sink for pollutants (such as CO₂ and ozone-depleting substances). The concerns related to the interaction of the environmental domain with social issues are also addressed, including the needs to promote equitable access to and adequate supplies of water, improved sanitation, to reduce exposure to indoor air pollution and to improve the lives of slum dwellers.

Table 1. Targets and indicators of MDG 7 - Ensuring environmental sustainability

| Targets | Indicators |
|---|--|
| Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources. | <ul style="list-style-type: none"> • Proportion of land area covered by forests • Land area protected to maintain biological diversity • Energy use per unit GDP • Per capita CO₂ emissions and consumption of ozone-depleting substances |
| Halve by 2015 the proportion of people without sustainable access to safe drinking water. | <ul style="list-style-type: none"> • Proportion of population with sustainable access to improved water source and adequate sanitation |
| Achieve by 2020 a significant improvement in the lives of at least 100 million slum dwellers. | <ul style="list-style-type: none"> • Proportion of households with access to secure tenure |

117. Additional targets adopted at the World Summit on Sustainable Development in 2002 include targets pertaining to fisheries; marine protection; biodiversity loss; access to renewable energy; and phasing out organic pollutants (see Table 2, below). These targets are not officially part of the MDGs and the relevant indicators have not been determined. Access to adequate sanitation, emphasized along with the water supply target at the WSSD, was subsequently adopted as one of the MDG 7 indicators.

Table 2. Environmental targets adopted at the WSSD, 2002

| Targets | Indicators |
|---|--|
| Maintain or restore depleted fish stocks to levels that can produce the maximum sustainable yield by 2015 | To be determined |
| Reverse the loss of biodiversity by 2010 | Identified by the Convention on Biological Diversity |
| Establish a representative network of marine protected areas by 2012 | To be determined |
| Increase the share of renewable energy in the total energy supply, and provide 35 per cent of African households with modern energy within 20 years | To be determined |
| Phase out, by 2020, the production and use of chemicals that harm health and environment | To be determined |

118. MDGs have provided an operational framework for coherent action within the United Nations system and to identify how best it could support national efforts. The Millennium Declaration specifies outcomes and is proving to be an instrument for mobilizing the international community around a set of common goals and targets. Furthermore, MDGs have set a new trend towards developing policy relevant indicators.

E. UNEP's strategy

119. UNEP, in cooperation with the Scientific Committee on the Protection of Environment, organized a workshop on assessment of sustainability indicators, the results of which will be published by the Island Press. UNEP carried out an extensive review of indicators related to environmental vulnerability in the publication entitled "Assessing human vulnerability to environmental change and pertaining to coastal vulnerability" and in the forthcoming report entitled "Assessing coastal vulnerability: a proof of the concept". A number of regional initiatives have been undertaken for tracking environmental trends. Work continues towards the development of a preliminary composite index for environment. UNEP has been providing access to indicator databases through the GEO data portal. A partnership has been developed with the United Nations Statistical Division and other data providers for capacity-building in environmental statistics at the national level, where the majority of data collection and compilation activities are undertaken.

120. Further action by Executive Director in contributing to this trend will focus on:

- (a) Tracking progress towards internationally agreed targets and goals such as the MDGs and targets agreed at WSSD by a few leading performance based indicators which would serve as the basis for analysing trends and comparative analysis of countries over time;
- (b) Presenting indicators and related analysis in assessments and other publications such as the GEO Yearbook;
- (c) Identifying, through intergovernmental and multi-stakeholder consultations, gaps in observations and the need for the development of reliable and time-series data;
- (d) Addressing such gaps and needs by improving the quality and timeliness of data and mobilizing resources for capacity-building in partnership with organizations; and
- (e) Working towards development of an outcome-based composite index for environment similar to the Human Development Index.

F. A composite index for environment

121. A rise or fall in, for example, a Gross National Product (GNP) or an employment rate is subject to political and public debate and examination of macroeconomic policies. The release of the Human Development Index is eagerly awaited each year so as to judge and evaluate the efficiency of national policies for social development. People take notice and are either pleased or concerned when the Dow Jones Industrial Average Index increases or decreases on Wall Street, as individuals and corporations rewrite their fortunes with the rise and fall of stock exchange indices. There is, however, nothing comparable to judge or evaluate the outcome of national environmental policies or the state of a nation's environment.

122. Environment is considered as one of the three pillars of sustainable development, the others being the economic and the social. Notwithstanding its crucial role, however, the environment has not received the same priority and place on nations' developmental agendas as, for example, social and economic issues. The improvement of reliable trend data and the development of an acceptable environmental index at the national level are important in order to further strengthen environmental awareness and governance. The construction of an environmental index, disaggregated at least at the national level if not below, which could be easily digested and understood by the people, may contribute substantively to mainstreaming the environment in the developmental agendas of nations. Ever since the origin of the GDP concept in A.C. Pigou's seminal *Wealth and Welfare* (1912), it has been acknowledged that GDP is only a proxy and is not a perfect measure of welfare because it omits many important components which do not pass through markets. Since then, enormous resources have been invested in improving measures of the market components of the national well-being, but, proportionately, rather insignificant investment has been made in other components, such as environment.

123. There have been several initiatives to develop an environmental index, but none has so far established itself as a major policy guide. An index is a composite of several indicators. Combining relevant indicators from a vast array of environmental data into a composite index may reveal the available evidence in a more appealing fashion than individual indicators. Often, indices make headlines in the mass media, attract public opinion and mobilize actions from the political leadership. For example, economic indicators such as GDP and per capita income show the power of a single number whose significance is widely followed. However, public interest tends to focus more on relative ranking than on absolute scores. The relative ranking provides context and perspective, allowing the public to compare each country or theme on the same scale using similar measures and criteria. The ranking can stimulate discussions for change, as exemplified by Transparency International's contribution to debates on and action to combat corruption. Credit-risk rating agencies use the International Country Risk Guide Indicators as a tool to show the economic, political and administrative development of a certain country to foreign investors. Quantitative indexing, scoring and ranking are in vogue in many quarters of society. Those at the top of positive lists use this information to publicize their merits, and those at the bottom increasingly base their strategic plans around means to improve their rankings.

124. Environmental indicators are relatively underdeveloped compared to economic and social indicators. No popular environmental index equivalent to GDP and the Human Development Index, aggregated in a way that provides a sense of the big picture of environmental performance, exists to facilitate the comparative ranking of countries based on common information and consistent criteria. Such an index would certainly draw wider public attention, bring transparency and accountability to policy-making and create a basis for fine-tuning policies for maximum effectiveness. A composite index for environment should be able to incorporate the principles embraced at the 1992 Earth Summit, the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity and other global environmental agreements and goals, the targets set under the MDGs and the plan of implementation of the World Summit on Sustainable Development.

125. The only way to ensure the provision of environmental information on a routine basis is to build national capacity for collection, compilation, and analysis of environmental data. There is a need for greatly improved environmental information and data systems which will collect baseline data in a coherent and compatible fashion and make those data available to international reporting sources.

Box 1. Functions and definitions of environmental indicators

The OECD terminology points to two major functions of indicators:

- They reduce the number of measurements and parameters that normally would be required to give an *exact* presentation of a situation.
As a consequence, the size of an indicator set and the level of detail contained in the set must be limited. A set with a large number of indicators will tend to clutter the overview it is meant to provide.
- They simplify the communication process by which the results of measurements are provided to the user.
As a result of this simplification and adaptation to user needs, indicators may not always meet strict scientific demands to demonstrate causal chains. Indicators should therefore be regarded as an expression of “the best knowledge available”.

Definitions

Indicator: A parameter or a value derived from parameters, which points to, provides information about, and describes the state of a phenomenon/environment / area, with a significance extending beyond that directly associated with a parameter value.

Index: a set of aggregated or weighted parameters or indicators.

Parameter/Data: a property that is measured or observed.

(Source: OECD Environmental Indicators: Development, Measurement and Use, 2003)

Box 2. Criteria for selecting environmental indicators

As indicators are used for various purposes, it is necessary to define general criteria for selecting indicators and validating their choice. The following three basic criteria are used in OECD's work:*

| | |
|---|--|
| Policy relevance and utility for users | <p>An environmental indicator should:</p> <ul style="list-style-type: none"> • Provide a representative picture of environmental conditions, pressures on the environment or society's responses; • Be simple, easy to interpret and able to show trends over time; • Be responsive to changes in the environment and related human activities; • Provide a basis for international comparisons; • Be either national in scope or applicable to regional environmental issues of national significance; • Have a threshold or reference value against which to compare it, so that users can assess the significance of the values associated with it. |
| Analytical soundness | <p>An environmental indicator should:</p> <ul style="list-style-type: none"> • Be theoretically well founded in technical and scientific terms; • Be based on international standards and international consensus about its validity; • Lend itself to being linked to economic models, forecasting and information systems. |
| Measurability | <p>The data required to support the indicator should be:</p> <ul style="list-style-type: none"> • Readily available or made available at a reasonable cost/benefit ratio; • Adequately documented and of known quality; • Updated at regular intervals in accordance with reliable procedures. |

Extract from “Environmental indicators for environmental performance reviews,” OECD, 1993.

*These criteria describe the “ideal” indicator; not all of them will be met in practice.

Annex V

Thematic assessments

UNEP is engaged in the following thematic assessment activities:

A. Global Land Cover Network (GLCN)

126. UNEP, in collaboration with the Food and Agriculture Organization of the United Nations (FAO) and other partners, continues to implement Global Land Cover Network (GLCN). GLCN is based on the FAO/UNEP Land Cover Classification System, a comprehensive methodology for the description, characterization, classification and comparison of most land-cover features identified anywhere in the world, at any scale or level of detail. As part of the GLCN capacity-building programme, UNEP and FAO organized two regional workshops on harmonization of land-cover data through the Land Cover Classification System methodology and other related software and by distributing remotely sensed land-cover data sets to developing countries in 2003. One workshop was held in Dakar for West African countries and the other was held in Bangkok for countries in the Asia and the Pacific region. Preparations have been made to hold two more courses in November and December 2004: one in Quito for South American countries and another in Pretoria for southern African countries. Further courses are scheduled to be held in the first half of 2005 for North Africa, West and Central Asia and Central America. In addition, national-level courses are anticipated in 2005 in China and a number of Central Asian countries.

B. Land Degradation Assessment in Dryland (LADA)

127. The LADA (www.fao.org/ag/agl/agll/lada) project has been developed over the period of the last two and a half years through a Global Environment Facility (GEF) PDF-B project. A full-scale project was submitted in September 2004 to GEF for endorsement by the GEF council during its meeting in November 2004 and for subsequent inclusion in the GEF pipeline.

C. International Assessment of Agricultural Science and Technology for Development (IAASTD)

128. The IAASTD (www.agassessment.org), developed through a process of regional multi-stakeholder consultations over the period of about two years, was endorsed in the intergovernmental plenary meeting in Nairobi from 29 August to 3 September 2004. The three-year implementation phase of the multi-stakeholder partnership IAASTD is planned to start in 2005 with financial support from GEF, World Bank, UNEP and other co-sponsors – FAO, UNEP, UNDP, UNESCO and WHO – and with co-financing and in-kind support from other partners – national Governments, non-governmental organizations and the private sector. A more detailed description of IAASTD is provided in annex VIII below.

D. Global assessment of the state of the marine environment

129. In reference to GA resolution 57/141 and as requested by decision GC22/1/II, UNEP is contributing to the implementation of the global marine assessment (www.unep.org/dewa/water/marineassessment) process through strengthening its own assessment activities and collaboration with its Regional Seas Programme, UNEP-World Conservation Monitoring Centre. UNEP is also contributing to the assessment through partnerships with other United Nations agencies, including the Intergovernmental Oceanographic Commission of United Nations Educational, Scientific and Cultural Organization and the United Nations Division for Ocean Affairs and the Law of the Sea. UNEP will contribute to the follow-up to the next United Nations General Assembly resolution related to Global Marine Assessment (fifty-ninth session) and will keep Governments informed. For more details see the information document on the Global Marine Assessment.

E. Global International Waters Assessment

130. The GEF-funded Global International Water Assessment (GIWA) project (www.giwa.net) assesses major environmental problems related to international (trans-boundary) waters, including the social root causes. It identifies their geographical boundaries and provides background and analytical information for establishing priority issues and formulating appropriate policy responses and areas of intervention. The scientific capability of GIWA has been strengthened and it is now producing and publishing regional assessments. By the end of 2004, GIWA will have published 22 out of 66 regional assessment reports and 20 more will be ready for publishing. This will cover 98 per cent of all GEF eligible regions. In view of the approaching end of the project, a proposal has been put forward for further usage of the available GIWA networks and assessment methodologies developed.

F. Global Environment Monitoring System (GEMS)/Water

131. For global freshwater assessment and monitoring UNEP's GEMS/Water programme has been revitalized. GEMS/Water is a global water-quality monitoring programme which collects and assesses water-quality data from 104 developing countries and countries with economies in transition. The programme provides information on the state and trends of global inland water quality for decision-making processes related to integrated water resources management and development and sustainable use of freshwater resources. For more details, see www.gemswater.org. GEMS/Water activities contribute to measuring the role of the programme in terms of the internationally agreed goals of the Millennium Declaration, the Johannesburg Plan of Implementation targets, and in meeting commitments outlined in Agenda 21, chapters 18 on freshwater and 40 on information for decision-making. The GEMS/Water programme emphasizes collaboration, partnerships and synergy between international water and science programmes and initiatives within the United Nations system, including full consideration of water quality in working towards the Millennium Development targets on water and sanitation. GEMS/Water also urges Governments and international organizations to further contribute to the Trust Fund for GEMS/Water and to provide institutionally and financially for water-quality monitoring networks.

G. Intergovernmental Panel on Climate Change (IPCC)

132. IPCC (www.ipcc.ch) was established by the World Meteorological Organization (WMO) and UNEP. In accordance with its mandate and as reaffirmed in various decisions by the Panel, the major activity of the IPCC is to prepare, at regular intervals, comprehensive and up-to-date assessments of policy-relevant scientific, technical and socio-economic information relevant for the understanding of human-induced climate change, potential impacts of climate change and options for mitigation and adaptation. At its eighteenth session, in September 2001, the Panel decided to continue to prepare comprehensive assessment reports and agreed that the Fourth Assessment Report (www.ipcc.ch/activity/ar.htm#ar4) would be completed in 2007. During its twentieth session, in February 2003, the panel also decided to adopt a framework and a set of criteria for establishing priorities for special reports, methodology reports and technical papers for the period of the fourth assessment to guide, but not prescribe, future decisions by the Panel regarding its work programme.

H. The Millennium Ecosystem Assessment (MA)

133. The MA (www.millenniumassessment.org) is designed to provide decision-makers with accurate and comprehensive scientific information on the capacity of ecosystems to maintain their natural systems and services. It also assesses consequences of ecosystem changes for human well-being and options for responding to them, and how to better achieve human development and sustainability goals. During 2004, the MA draft assessment reports went through two rounds of review by experts and Governments. Synthesis reports for specific audiences such as the CBD, the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, the Ramsar Convention on Wetlands of International Importance, Especially as Waterfowl Habitat, and also business and industry, are being prepared and will shortly undergo review. GRID-Arendal will provide support for the preparation of graphics and figures for the MA's synthesis reports. The MA products will be approved by the MA Board and released in March 2005. A plan for outreach activities around the MA products will be implemented up to the end of 2005. Among the MA's sub-global assessments, the southern Africa sub-global assessment is largely complete, with the

Zambezi basin and GorongosaMarromeu components currently being finalized. The SAfMA integrated report, the regional assessment report, and the Gariep basin report have been published and are now available. Partners involved in the assessment are currently examining how best to make use of the MA findings including in strengthening the ecosystem aspects of sub-global environmental research, assessment and management.

Annex VI

Regional dimensions of assessment and early warning activities

A. Africa

134. In Africa, the major activity is the Africa Environment Outlook (AEO) process, which incorporates the Africa Environment Information Network (AEIN) and early-warning activities, particularly in the Great Lakes region. Several meetings, attended by more than 200 people, have been organized as part of preparing the second AEO report for launch in 2006. The AEIN initiative, whose objective is to provide a framework for increasing access to environmental information in Africa, is being implemented in 13 pilot African countries. Training workshops in integrated environmental assessment and reporting have been held in eastern, western, northern and southern Africa and the Indian Ocean islands. Young people have held subregional meetings to discuss the contents of the first AEO -for-Youth report, which is scheduled for publication by the middle of 2005.

B. Asia-Pacific

135. In Asia-Pacific, so far two city, 10 national and two subregional state-of-the-environment (SOE) reports have been published involving Government, academicians and civil society members by engaging relevant national, as well as GEO, collaborating centres with UNEP capacity-building activities. A youth version of the South Asian SOE called "Children of the Monsoon", written by young people, has provided a platform for forming the South Asia Youth Environment Network, which has been active in the South Asian subregion in addressing environmental reporting with donor-funded projects at subregional and national levels. The Democratic People's Republic of Korea report, the Bangkok City 2003 assessment report and the Environmental Atlas of the Greater Mekong subregion were published in 2004. Preparation of three city, four national and three subregional assessment reports are either under way or starting. These assessment reports include Dhaka, the Kathmandu valley and Karachi at the city level; Bhutan, Cambodia, Tajikistan and Turkmenistan at the national level; and the Greater Mekong subregion, South Asia and Central Asia at the regional level. Launching of five subregional environmental indicator reports are scheduled for November, during the subregional policy dialogue forum. UNEP has been assisting the implementation of phase two of the Male Declaration on the Control and Prevention of Air Pollution and its likely Transboundary Effects for South Asia by putting in place expertise and monitoring equipment.

C. Europe

136. The most prominent assessment activity in Europe currently is the Carpathians Environment Outlook subregional integrated environmental assessment process. In the realm of early warning, UNEP continues with its series of early warning "brief reports" on problems of emerging environmental significance in Europe, other regions and globally. Under the banner of capacity-building, UNEP, with GRID-Arendal, organizes training and workshops for the Eastern European, Caucasus and Central Asia region countries on integrated environmental assessment, early-warning and related activities. Included also are a number of projects under the banner of the "Environment and Security" initiative for South-eastern Europe, Central Asia and the Caucasus to address environmental problems that could prove to be destabilizing or divisive between peoples and States. This initiative is led by the Organization for Security and Co-operation in Europe (OSCE), the United Nations Development Programme and UNEP.

D. Latin America and the Caribbean

137. In the Latin America and the Caribbean (LAC) region, Guatemala, El Salvador, Nicaragua, and Panama have completed their national environment outlook reports in 2004 with assistance from UNEP. Assessments also are either under way or starting in Central America, the Southern Cone Common Market, the Caribbean and eight additional countries. The GEO Cities urban area assessment has been exceptionally successful, completing seven assessments and planning 16 more. All assessments in LAC have a strong focus on capacity-building, and this is emphasized in the GEO for Youth programme, which is carrying out a series of activities using its own capacity-building manual. Work on the indicators component of the LAC Initiative for Sustainable Development is well under way, with the

direct participation of 16 countries. The focal points, together with the Government of Costa Rica (appointed by the Forum of Ministers of Environment of LAC as the lead country in the matter) and UNEP, have developed methodological sheets for 38 indicators. The GEO regional data portal, which will be developed in 2005, will support the development and use of these indicators. UNEP has made special efforts to foster strategic collaboration between United Nations agencies, for example, with UN-Habitat for GEO Cities, and with the Pan-American Health Organization for GEO health activities.

E. North America

138. In North America, UNEP published and distributed widely the report entitled “Assessing Human Vulnerability to Environmental Change”. Targeted assessments, which provided scientific evidence of changes in some of the rapidly changing regions of the world such as Irian Jaya, Atatürk Dam, Lake Chad, the Sundarbans, and Iguazú National Park were also prepared under the title “Analysing Environmental Trends using Satellite Data: Selected Cases.” As a part of capacity-building efforts, LandSat satellite data for 1990 and 2000 for 168 countries were distributed. UNEP continues to provide input and follow-up on successor mechanisms to the Earth Observation Summit and Integrated Observation of Lands. A strategic partnership with the American Association of the Advancement of Science was developed for the purpose of engaging science for sustainable development. A total of 11 scientists from developing countries were trained in environmental analysis and monitoring technologies. A partnership was developed with the United Nations Statistical Division on environmental statistics and indicators for the Millennium Development Goals.

F. Polar regions

139. UNEP is also engaged in activities in the polar regions. For the Arctic region, in March 2004 the European Environment Agency (EEA) and UNEP jointly produced a synthesis report on the Arctic environment from a European perspective. The report highlighted the dependency of Europe on many Arctic resources and the increased impacts associated with unsustainable development, land fragmentation, climate change and pollution. UNEP provided mapping support to the latest report of the Arctic Climate Impact Assessment, which will be launched in November 2004. The Arctic Climate Impact Assessment is a project of the Arctic Council and the International Arctic Science Committee to evaluate and synthesize knowledge on climate variability, climate change, and increased ultraviolet radiation and the consequences of those factors. In cooperation with the SnowChange project (www.snowchange.org) and Arctic indigenous peoples' organizations, UNEP is developing a set of vital Arctic graphics to highlight the main environmental and sustainable development issues in the region. In cooperation with World Wide Fund for Nature's Arctic Programme, UNEP is preparing an assessment of Arctic protected areas. Although the Arctic holds over 98 per cent of the world's undeveloped coastlines, less than 1 per cent is protected. The report will be launched in early 2005. In collaboration with partners, UNEP has prepared a new early warning report titled “Europe's Last Wilderness: Reindeer Husbandry under Threat in the Barents Sea Region” The report will be launched during the World Reindeer Herders' Association Congress, to be held in Yakutsk in March 2005. UNEP participated in the Antarctic Treaty Consultative Meetings as an expert organization and submitted two study reports. The first report reviewed the state of conservation and the conservation status afforded under international law to Antarctic mammals and birds. The second report is a desk study on the current extent of bioprospecting in Antarctica. The main challenges facing Antarctica and the Southern Ocean remain the impacts of climate change and the increase in commercial activities, in particular illegal, unreported and unregulated fishing activities and tourism.

G. West Asia

140. Capacity-building has been one of the key activities in West Asia, focusing on national and regional training in integrated environmental assessment, and developing frameworks for national SOE reports. It also included the development of a regional strategy for capacity-building, a database on training assessment institutions, and guidelines on the development and use of environmental indicators. Another key activity is supporting the Abu Dhabi Global Environmental Data Initiative, including the preparation of a regional study on experiences and best practices on the development and management of environmental data. The regional study will synthesize 15 reports prepared by national and regional institutions. UNEP is also coordinating the Arab Millennium Sub-Global Ecosystem Assessment, which includes three sites in Saudi Arabia, Egypt and Morocco.

Annex VII

Progress report to twenty-third session of the GC-GMEF on the implementation of Governing Council decision 22/1 II *(Global Assessment of the State of the Marine Environment)*

Report on UNEP's contribution to the regular process of global assessment of the state of the marine environment called for in General Assembly resolution 57/141, pursuant to paragraph 2 of decision 22/1 II: Global Assessment of the State of the Marine Environment.

Summary

The present report has been prepared in pursuance of Governing Council decision 22/1 II of February 2003. It outlines the progress made to date by the United Nations Environment Programme (UNEP) in response to the request by the Governing Council to the UNEP Executive Director "to make the necessary arrangements for the active participation and appropriate contribution of the United Nations Environment Programme to the preparatory process for the establishment of a regular process for global reporting and assessment of the state of the marine environment as called for in General Assembly resolution 57/141." A number of activities have been implemented as the contribution of UNEP to the global marine assessment (GMA) process and in collaboration among UNEP programmes including the Regional Seas Programme (RSP), UNEP-World Conservation Monitoring Centre (WCMC); and with other United Nations agencies including the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO-IOC) and the United Nations Division for Ocean Affairs and the Law of the Sea (UN-DOALOS). The above-mentioned activities are presented in chronological order as follows:

- (a) Internal consultation between UNEP divisions and programmes in March 2003;
- (b) The response to the request by UN-DOALOS concerning a proposal on modalities and UNEP's contribution to the GMA;
- (c) Establishment of a trust fund to support the participation of developing countries in the GMA process and calling upon Governments to contribute to the fund;
- (d) Organization of a consultative meeting with key experts and Governments in The Hague, 26–27 May 2003;
- (e) UNEP's participation in the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (UNICPOLOS) in New York, 2–6 June 2003;
- (f) The joint, 132-page, publication by UNEP and UNESCO-IOC on "A Survey of Global and Regional Marine Environmental Assessments and Related Scientific Activities",¹⁶ in August 2003 as the first joint contribution to the GMA process;
- (g) Participation in the interagency consultative meeting on the establishment of the global marine environment assessment, in Paris, 8–9 September 2003;
- (h) Organization of a planning meeting for a GEO-marine assessment report which will contribute to the GMA, back-to-back with the meeting of the regional coordinators of the Regional Seas Programme, in Nairobi, 19–21 November 2003;
- (i) UNEP's participation in the meeting of the Group of Experts which was convened in New York, 23–26 March 2004, pursuant to paragraph 64 (a) of General Assembly resolution 58/240; and
- (j) UNEP's participation in the fifth meeting of the UNICPOLOS, and the GMA International Workshop convened in New York, 7–11 June 2004.

¹⁶ The survey was carried out by UNEP-WCMC in collaboration with UNESCO-IOC and with support from the Federal Ministry of Education and Research of Germany, the Ministry for the Environment of Iceland and the Department for Environment, Food and Rural Affairs of the United Kingdom.

141. The internal consultation between UNEP divisions and programmes was carried out in March 2003 to identify existing programmatic and available budgetary resources of UNEP which could contribute to the GMA process. A number of ongoing UNEP assessment projects and programmes, including the Global Environment Outlook (GEO), the Global International Waters Assessment (GIWA), the Millennium Ecosystem Assessment and RSP were identified as potential activities and frameworks on which the GMA could build. The relevant findings of these assessments could be provided as inputs to the GMA. It was recognized that UNEP should focus its effort and contribution on the coastal aspects rather than the open ocean, given its area of expertise in environmental assessment.

142. In pursuance of paragraph 45 of General Assembly resolution 57/141, of 12 December 2002, UN-DOALOS addressed letters to Member States and all relevant international organizations, agencies and programmes soliciting proposals on modalities for a GMA, and their contribution to the process. UNEP took the opportunity to emphasize that, corresponding to the General Assembly resolution, a new Governing Council decision also requested the Executive Director to make the necessary arrangements for the active participation and appropriate contribution of UNEP to the GMA process. In implementing the decision, UNEP, through the UNEP-wide consultation, had already identified its ongoing and projected marine assessment activities including GEO, GIWA and Millennium Ecosystem Assessment. In its response to UN-DOALOS, UNEP indicated that the relevant findings of these assessment activities could add value and provide significant assets to the GMA. It was also pointed out that UNEP sees the GMA as a composite process whereby different United Nations agencies can contribute within a common partnership framework on the basis of their own areas of expertise and competence. Also, an expert meeting on the modalities of the assessment within the UNEP framework would be held to explore further considerations on UNEP's contribution. It was also added that UNEP was making arrangements for the establishment of a trust fund to facilitate the involvement of experts from developing countries.

143. UNEP completed the establishment of a trust fund in support of decision 22/1 II on 9 April 2003, and Governments have been called upon to contribute to the trust fund. In addition, the UNEP web site devoted for the GMA process (<http://www.unep.org/dewa/water/marineassessment>) was updated.

144. Following the response to UN-DOALOS, on 26 and 27 May 2003 UNEP organized an informal consultative meeting on UNEP's contribution to the development of GMA at the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) office in The Hague. The participants were from Iceland, Sweden, the United Kingdom and the United States of America and various international organizations were also represented, including the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), GIWA, the Land-Ocean Interactions in the Coastal Zone International Project and the UNEP Collaborating Centre on Water and Environment. The aim of the meeting was to explore how UNEP could best serve and contribute to the GMA process based on its existing programmatic and available financial resources. It was concluded that UNEP's area of competence lies in:

- (a) Its expertise and experience in environmental assessment;
- (b) Its extensive global and regional networks of institutions and scientists;
- (c) Its interaction and collaboration with other relevant global and regional policy bodies which could contribute to the implementation of GMA, such that between the UNEP Governing Council and Global Ministerial Environment Forum, the Convention on Biological Diversity (CBD), RSP and GPA; and
- (d) Its strong capacity-building component targeting developing countries.

145. The meeting also provided key recommendations, as follows:

- (a) An interagency consultation between relevant United Nations agencies should be convened under the auspices of UN-DOALOS to consider the following:
 - (i) The coastal and marine issues which GMA should address;
 - (ii) Design options for GMA that maximize the use of existing assessment activities and resources and avoid duplication of existing activities;
 - (iii) How to engage various United Nations organizations, Governments, non-governmental organizations and regional and national institutions in the process;

- (iv) How to avoid costly operations and manage the GMA within the limited additional resources available; and
- (v) How to avoid further delay in global reporting and assessment.

(b) A meeting could be convened, as a contribution to the process, before the end of 2003 to explore the scope and methodology of GMA, as well as the links between UNEP's science-based assessment activities and other endeavours such as CBD, GPA and RSP.

146. A working document outlining the outcome of the consultation and UNEP's contribution was produced and made available at <http://www.unep.org/dewa/water/marineassessment>.

147. The UNEP secretariat participated in the UNICPOLOS in New York from 2 to 6 June 2003 and conveyed the findings of the informal consultation in The Hague in May 2003. It also discussed with various key Governments such as Australia, Belgium, Canada, Finland, Iceland, New Zealand, Norway, Sweden, the United Kingdom and the United States of America; United Nations agencies including DOALOS and UNESCO-IOC; and international organizations such as GESAMP, the Arctic Council and the International Council for the Exploration of the Sea (ICES). It was proposed and agreed that an inter-agency meeting should be organized by UN-DOALOS at the office of UNESCO-IOC on 8 and 9 September 2003.

148. During the UNICPOLOS, UNEP also discussed and agreed with UNESCO-IOC to officially publish a joint publication, the *Survey of Global and Regional Marine Environmental Assessments and Related Scientific Activities*, as the first contribution to the GMA. The survey was undertaken by WCMC between September 2002 and January 2003 in collaboration with UNEP and UNESCO-IOC and with the support of Germany, Iceland and the United Kingdom, and was published in August 2003.

149. The findings of the survey were presented by UNEP to the inter-agency consultative meeting on the establishment of the global marine environment assessment held in Paris on 8 and 9 September 2003, together with a model for a composite process that reflects UNEP's view of the need for one common framework of partnership. Other United Nations agencies participating in the inter-agency meeting included, *inter alia*, UN-DOALOS, the International Atomic Energy Agency, the International Maritime Organization (IMO), the Food and Agriculture Organization of the United Nations, UNESCO-IOC, the World Meteorological Organization, and the secretariat of the CBD. The meeting discussed the general framework of GMA; the relationship between relevant existing assessments and the GMA; coastal and marine issues to be investigated; the contribution of United Nations agencies, States, and regional organizations; and funding and capacity-building for the GMA.

150. In accordance with the need for GMA to build on existing programmes and activities, UNEP will contribute, through its core marine-related assessment projects, *inter alia* GIWA and the Millennium Ecosystem Assessment, by extracting the key scientific and policy-relevant findings of these marine-related assessments to produce policy summary reports targeting policy-makers. The reports presently being prepared will be considered as a contribution to the overall GMA process.

151. As a follow-up to the key recommendations from the consultative meeting in The Hague, UNEP convened a planning meeting for a GEO-marine assessment designed to contribute to the GMA, in Nairobi from 19 to 21 November 2003, back-to-back with the fifth Global Meeting of the Regional Seas, held from 25 to 27 November 2003. The meeting discussed a plan for the development of the marine component of the GEO project as UNEP's contribution to the overall GMA process. The meeting involved not only experts from developed and developing countries, but also brought in the regional perspective from experts attending the fifth GMRS. A meeting report was prepared and is now available on the GMA web site.

152. UNEP participated in the meeting of the Group of Experts meeting convened in New York from 23 to 26 March 2004 pursuant to paragraph 64 (a) of General Assembly resolution 58/240. The meeting was composed of representatives of States, intergovernmental organizations and non-governmental organizations, including both scientists and policy-makers. The Group of Experts established by General Assembly resolution 58/240 concluded that GMA should produce regular integrated global syntheses of the status and trends of marine ecosystems, including their socio-economic aspects. GMA should be built, as far as possible, on integrated regional assessments conducted by regional affiliates. The process of conducting GMA should facilitate continuous access to information on the status and trends of marine ecosystems on diverse geographic scales.

153. UNEP participated in the fifth meeting of the UNICPOLOS and the GMA international workshop convened in New York from 7 to 11 June 2004. The main objective of the workshop was to review and discuss the draft report of the GMA expert group prepared pursuant to paragraph 64 (a) of General Assembly resolution 58/240. No consensus was reached on the establishment of the GMA. It was decided that negotiations between Governments would continue until the fifty-ninth session of the General Assembly, during summer 2004, to come to an agreement. The GMA process would then proceed to a “start-up” phase, which would entail an “assessment of assessments.” An advance, unedited version of the draft document has been placed on the DOALOS web site.¹⁷

154. In conclusion, negotiations on the establishment of the GMA process were to continue between Iceland, other countries and other groups of regions, including the G77 and China, up to the fifty-ninth of the United Nations General Assembly, with the hope that a consensus would be reached which would allow the start-up of the initial phase, the “assessment of assessments”. UNEP has continued to work on the development of policy summary reports based on key scientific and policy-relevant findings of the coastal and marine assessment projects of UNEP, particularly the GIWA and the Millennium Ecosystem Assessment. Also, UNEP has further developed modules for the assessments of coastal and marine environments, in partnership with key institutions and collaborators, which will contribute to the GMA process once it has been established.

155. The Executive Director will continue to pursue the implementation of Governing Council decision 22/1 II, ensure the follow up of the United Nations General Assembly resolution related to GMA to be adopted at the fifty-ninth session, and will keep Governments informed. Planned activities will be implemented in accordance with available funds.

¹⁷ See http://www.un.org/Depts/los/consultative_process/consultative_process.htm.

Annex VIII

The International Assessment of Agricultural Science and Technology for Development (IAASTD)

Summary of the First Plenary Meeting of IAASTD (Nairobi, 30 August to 3 September 2004)

156. The First Plenary Meeting of the International Assessment on Agricultural Science and Technology for Development (IAASTD) was held in Nairobi from 30 August to 3 September 2004. This initiative is unique as it has brought together six co-sponsoring agencies. These include the Food and Agriculture Organization of the United Nations, the United Nations Development Programme, UNEP, the United Nations Educational, Scientific and Cultural Organization, the World Bank and the World Health Organization. The initiative has also involved stakeholders from Governments, producer and consumer groups, agricultural research institutions, non-governmental organizations and the private sector, many of whom had been involved in the consultative and participatory process over the previous two years.¹⁸

157. Representatives of 45 Governments together with representatives from the private sector, non-governmental organizations, producers, consumers, the scientific community and international organizations participated in the first plenary meeting of IAASTD. The meeting agreed on the objectives, goals, scope, key questions, design, preparation and peer-review processes, outputs, timetable, budget, and governance structure of IAASTD.

158. The plenary agreed that the IAASTD would:

(a) Undertake global and sub-global assessments of the role of knowledge, science and technology (KST) as it pertains to agriculture in reducing hunger and poverty, improving rural livelihoods and health, increasing incomes and facilitating equitable, environmentally, socially and economically sustainable development;

(b) Provide robust information for decision-makers on how to ensure that policies, practices and institutional arrangements enable KST to contribute to reducing hunger and poverty, improving rural livelihoods and health, increasing incomes, and facilitating equitable, environmentally, socially and economically sustainable development; and

(c) Bring together the range of stakeholders (consumers, Governments, non-governmental organizations, the private sector, producers, the scientific community and international agencies) involved in the agricultural sector and rural development to share views, achieve common understanding and develop a common vision for the future.

159. The plenary also agreed that the IAASTD will comprise a global assessment and five sub-global assessments (Sub-Saharan Africa, East and South Asia and the Pacific, Latin America and the Caribbean, Central and West Asia and North Africa, and Europe and North America). Each assessment will have three sections, including a first section on historical perspectives, a second section on plausible futures; and a final section on policy and institutional issues.

160. The overarching question which provides the framework for the IAASTD is: "How can we reduce hunger and poverty, improve rural livelihoods, and facilitate equitable, environmentally, socially and economically sustainable development through the generation of, access to, and use of agricultural knowledge, science and technology"?

161. This suggests four broad questions regarding agricultural knowledge, science and technology (KST):

(a) What are the challenges that can be addressed through agricultural KST?

¹⁸

See <http://www.agassessment.org> for the report of the meeting and further background information.

- (b) What are the likely positive and negative consequences of agricultural KST?
- (c) What are the enabling conditions required to optimize the uptake and diffusion of agricultural KST? and
- (d) What investments are needed to help realize the potential of agricultural KST?

162. The historical section will include an analysis of existing knowledge to determine factors responsible for successes and failures in the diffusion and use of agricultural KST. The plausible future scenarios section will be used to anticipate the challenges that the world will face over the next 50 years and assess the demand for agricultural goods and services and the resulting impact on nutritional security, rural livelihoods, human health and food safety, and the environment and natural resources. The historical and plausible futures sections will then provide the framework for assessing first, the relevance, quality and effectiveness of agricultural KST and, second, the effectiveness of public and private sector policies and institutional arrangements, including at the community level. These will be considered in relation to agricultural KST and in relation to the broader objectives of:

- (a) Hunger and poverty reduction and the improvement of rural livelihoods and incomes;
- (b) The environment (water, land use, soils, biodiversity and atmosphere);
- (c) Equitable socially and economically sustainable development; and
- (d) Human health (nutrition and food safety).

163. The IAASTD has a number of unique structural features:

- (a) It is conducted as an intergovernmental process with a 60-member multi-stakeholder Bureau (30 governments, 6 private-sector, 6 non-governmental organizations, 6 producers', 4 consumers' and 8 international organizations);
- (b) It is co-sponsored by seven international agencies, FAO, Global Environment Facility, UNDP, UNEP, UNESCO, WHO and the World Bank;
- (c) It is based on a international consultative process and well-defined multi-user needs; and
- (d) It is prepared and peer-reviewed by hundreds of experts from all stakeholder groups.

164. The IAASTD has a number of unique substance features:

- (a) It is multi-thematic, in that it covers, nutritional security, livelihoods, human health and environmental sustainability;
- (b) It is multi-spatial, combining global and sub-global assessments using a consistent framework;
- (c) It is multi-temporal, taking both a short- and long-term perspective (now to 2050), employing plausible futures;
- (d) It integrates indigenous/local knowledge with institutional knowledge; and
- (e) It assesses the state of scientific knowledge as well as the effectiveness of institutions and policies.

165. The impact of the expected results of the IAASTD will vary as a function of the end user. However, all stakeholders are expected to benefit from better information, more knowledge and a clearer understanding of what is known with confidence and what remains uncertain. Governmental bodies will have access to new methods and models for evaluating policy options; the private sector will have better information for evaluating business strategies; civil society will have better information to use in evaluating the decisions of Government policy makers, and

parties to the conventions will be able to use the information to implement the conventions more effectively.

166. The global and sub-global assessments will be completed by September 2007, with the first products ready for peer review by December 2005.

167. The plenary approved a baseline budget of \$10.76 million plus significant in-kind contributions, for example, Organisation for Economic Co-operation and Development Governments would pay directly for their own experts to participate in expert author meetings. The plenary recognized that, if additional funds could be secured beyond the baseline budget, there would be significant value in undertaking further work beyond the baseline work plan in order to increase ownership and broaden participation at regional and subregional levels.

Annex IX

The *ad hoc* intergovernmental Group on Earth Observations and the Global Earth Observation System of Systems (GEOSS)

A. Background

168. On 31 July 2003, at the first Earth Observation Summit (EOS-I) held in Washington D.C., 33 nations plus the European Commission adopted a declaration that signifies political commitment to move towards the development of a comprehensive, coordinated, and sustained Earth observation system. Recalling the World Summit on Sustainable Development, which called for strengthened cooperation and coordination between global observing systems and research programmes for integrated global observations and recalling the outcome of the G-8 Summit held in Evian, Switzerland from 1 to 3 June 2003, which called for strengthened international cooperation on global observation of the environment, participants in EOS-I affirmed in their declaration:

“the need for timely, quality, long-term, global information as a basis for sound decision-making. In order to monitor continuously the state of the Earth, to increase understanding of dynamic Earth processes, to enhance prediction of the Earth system, and to further implement our environmental treaty obligations”

169. To satisfy this need, the EOS-I participants launched the *ad hoc* intergovernmental Group on Earth Observations (*ad hoc* GEO). The *ad hoc* GEO seeks to:

(a) Improve coordination of strategies and systems for observations of the Earth and identify measures to minimize data gaps, with a view to moving toward a comprehensive, coordinated and sustained Earth-observation system or systems;

(b) Coordinate an effort to involve and assist developing countries in improving and sustaining their contributions to observing systems, as well as their access to and effective utilization of observations, data and products, and the related technologies, by addressing capacity-building needs related to Earth observations;

(c) Exchange observations recorded from *in situ*, aircraft and satellite networks dedicated to the purposes of the declaration, in a full and open manner with minimum time delay and minimum cost, recognizing relevant international instruments and national policies and legislation;

(d) Prepare a 10-year Implementation Plan for a Global Earth Observing System of Systems (GEOSS), taking into account existing activities and building on existing systems and initiatives;

(e) Define a process to periodically evaluate and revise the 10-year Implementation Plan; and

(f) Conduct such other activities, consistent with the declaration, as the members may deem necessary.

170. The *ad hoc* GEO is co-chaired by the United States of America, the European Commission, Japan and the Republic of South Africa. This process is led by Governments, with the participation of intergovernmental organizations and international scientific associations. Currently, the *ad hoc* GEO consists of 51 Government members and 29 participating international organizations (see section D below). Most of the members and participating organizations take an active part in one or more of the *ad hoc* GEO's five subgroups. The subgroups include user requirements and outreach, architecture, data utilization, capacity-building and international cooperation. A GEO secretariat is currently supported by the United States National Oceanographic and Atmospheric Administration (NOAA). In order to promote the development of the GEOSS, the *ad hoc* GEO was

mandated to develop a document describing the GEOSS framework and an associated 10-year Implementation Plan.

171. At the second Earth Observation Summit (EOS-II), held in Tokyo on 25 April 2004, Governments adopted the Framework Document for a 10-year Implementation Plan for a GEOSS. The Framework Document describes the principal benefits of Earth observations to a broad range of user communities, as well as the fundamental elements to be included in the 10-year Implementation Plan for the GEOSS.

172. The Framework Document describes the observational requirements in terms of nine societal benefits:

- (a) Reducing loss of life and property damage attributable to natural and human-made disasters;
- (b) Understanding environmental factors affecting human health and well-being;
- (c) Improving management of energy resources;
- (d) Understanding, assessing, predicting, mitigating and adapting to climate variability and change;
- (e) Improving water-resource management through better understanding of the water cycle;
- (f) Improving weather information, forecasting and warning;
- (g) Improving the protection and management of terrestrial, coastal and marine ecosystems;
- (h) Supporting sustainable agriculture and combating desertification;
- (i) Understanding, monitoring and conserving biodiversity.

173. The 10-year Implementation Plan establishes the operating principles, institutions and commitments relating to the GEOSS. It identifies steps to improve existing observing systems as well as the need for new observing systems. The Plan was negotiated at the fifth plenary meeting of the *ad hoc* GEO, in Ottawa in November 2004, and it will be adopted at the third Earth Observation Summit, to be held in Brussels in February 2005.¹⁹ GEOSS has an indefinite lifetime, subject to periodic review of its continued effectiveness.

174. The *ad hoc* GEO met several times since its first meeting, in Washington D.C. in November of 2003. The most recent plenary meeting (GEO -5) took place in Ottawa on 29 and 30 November 2004, and the GEO-6 meeting will take place in Brussels on 14 and 15 February 2005.

175. A special session of the *ad hoc* GEO process took place in Brussels on 27 and 28 September 2004 to discuss and exchange ideas about alternatives for the governance of the process in the future. In Brussels, the Director-General of the World Meteorological Organization (WMO) delivered a joint United Nations statement on behalf of the Executive Heads of the Food and Agriculture Organization of the United Nations (FAO), UNEP, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and WMO itself. A segment of the Joint Statement reads:

“we would welcome an arrangement under which the governance of GEOSS eventually becomes integrated with the United Nations system in a way that adds value to the various observing systems that are sponsored or co-sponsored by WMO, UNESCO including its IOC, FAO, UNEP and other international agencies and programmes such as the non-governmental ICSU. Universality of membership, supremacy of Governments and equality amongst parties are ideals that make the United Nations system unique. They will also be essential ingredients for the success of GEOSS and we believe the United Nations

¹⁹ See http://earthobservations.org/docs/IPTT_201-1web.pdf.

system is uniquely placed to ensure that success by providing the institutional framework for its implementation. It can provide the framework for GEO SS.”

176. Meanwhile, WMO officially presented to the secretariat of the *ad hoc* GEO an offer to host a future secretariat of the GEOSS. This offer, along with any other possible offers that might be put forward by other organizations, will be discussed at the GEO-5 and GEO-6 Plenary meetings, to be held on 29–30 November 2004 and 14–15 February 2005, and in the context of the discussions on governance for the successor mechanism of the *ad hoc* GEO.

B. UNEP’s participation in the ad hoc intergovernmental Group on Earth Observations process and its successor mechanism

177. Data and services from Earth observing systems are essential for implementing UNEP’s mandate to keep under review the world environmental situation and to fulfil Governing Council decision 22/1 I A to strengthen the scientific base of UNEP. For UNEP to accomplish this, it will be necessary to ensure that the Earth-observation processes and other relevant observing and monitoring system frameworks reflect the strategic requirements of UNEP and its partners in terms of data and technology needs.

178. The Plan of Implementation of the World Summit on Sustainable Development recognizes the reliance on Earth observing systems for meeting the internationally-agreed development goals including those contained in the Millennium Declaration (or Millennium Development Goals, MDGs). Actions to implement the plan include:

“132. Promote the development and wider use of earth observation technologies, including satellite remote sensing, global mapping and geographic information systems, to collect quality data on environmental impacts, land use and land-use changes, including through urgent actions at all levels to:

(a) Strengthen cooperation and coordination among global observing systems and research programmes for integrated global observations, taking into account the need for building capacity and sharing of data from ground-based observations, satellite remote sensing and other sources among all countries;

(b) Develop information systems that make the sharing of valuable data possible, including the active exchange of Earth observation data;

(c) Encourage initiatives and partnerships for global mapping.”

179. The international community’s efforts to meet the MDGs depend upon means and capabilities for comprehensive and accurate environmental assessments. Support is also necessary to help the development of indicators for the MDGs, especially those related to environmental sustainability.

180. Other MDGs are associated with socio-cultural aspects of human well being, and therefore cannot be measured directly by data provided by global observing systems. Nevertheless, these types of data help in assessing the state and trends of natural resources and the environment and are central to a wide range of activities, such as disaster prevention, mitigation and management, disaster-recovery planning, refugee-camp management and others. Global observing systems are a very important source of data and services for decision-making towards sustainable development.

181. An example of how observing systems may contribute to societal well-being is given in the analysis of the nine societal benefits carried out in the GEOSS 10-year Implementation Plan. Those societal benefits correspond with UNEP’s activities and programmes, particularly with the capacity-building and technology transfer aspects.

182. UNEP's interest in the current *ad hoc* GEO and the future GEOSS lies in:

- (a) Putting forward UNEP's prioritized needs and requirements for assessment and early-warning data and information services, highlighting current and future gaps and redundancies;
- (b) Bringing developing countries' requirements to the attention of other stakeholders in observing system-design and development processes;
- (c) Promoting and finding means to inform and involve developing countries in the global observing systems' frameworks and their implementation.

183. Some ways to achieve these objectives are:

- (a) Presenting UNEP's strategic assessment requirements in relevant working groups and plenary meetings of the *ad hoc* GEO and its successor mechanism;
- (b) Providing significant and substantive contributions to the development of strategic and programmatic documents;
- (c) Promoting best practices in observing-system design (particularly for *in situ* observations) to ensure that data and information services of each system can be integrated with other systems' services and those of member States using accessible technologies, including the Internet.

C. Conclusion

184. UNEP's mandate and the MDGs require UNEP not only to use, gather, distribute and build capacity on the use of observing systems for data and information but also to positively influence the processes that support the needs of the user community. These processes ultimately determine how existing observing systems may integrate and collaborate and how different actors will play a role in the development of systems frameworks, taking due consideration of which emerging environmental issues need to be assessed.

185. The established global Earth-observing systems and related activities are the building blocks of the GEOSS. The GEOSS 10-Year Implementation Plan, negotiated during the GEO-5 meeting in Ottawa on 29 and 30 November 2004 and submitted for approval at GEO-6 and for adoption at the third Earth Observation Summit on 16 February 2005 in Brussels clearly called for "effective consultation and coordination with the United Nations system and other international agencies sponsoring or cosponsoring the major component global observing systems", in order to ensure a successful implementation of the GEOSS.

D. Membership in the GEO (as of October 2004)

186. Membership in GEO includes 51 countries. These are:

- (a) Argentina;
- (b) Algeria;
- (c) Australia;
- (d) Belgium;
- (e) Belize;
- (f) Brazil;
- (g) Cameroon;
- (h) Canada;
- (i) Chile;
- (j) China;
- (k) Croatia;
- (l) Cyprus;
- (m) Denmark;
- (n) Egypt;

- (o) European Commission;
- (p) Finland;
- (q) France;
- (r) Gabon;
- (s) Germany;
- (t) Greece;
- (u) Guinea Bissau;
- (v) India;
- (w) Indonesia;
- (x) Iran;
- (y) Ireland;
- (z) Israel;
- (aa) Italy;
- (bb) Japan;
- (cc) Kazakhstan;
- (dd) Mali;
- (ee) Mexico;
- (ff) Morocco;
- (gg) Mozambique;
- (hh) Nepal;
- (ii) Netherlands;
- (jj) New Zealand;
- (kk) Nigeria;
- (ll) Norway;
- (mm) Portugal;
- (nn) Republic of the Congo;
- (oo) Republic of Korea;
- (pp) Russian Federation;
- (qq) South Africa;
- (rr) Spain;
- (ss) Sudan;
- (tt) Sweden;
- (uu) Switzerland;
- (vv) Thailand;
- (ww) Ukraine;
- (xx) United Kingdom;
- (yy) United States;
- (zz) Uzbekistan.

187. Membership in GEO also includes 29 organizations. These are:

- (a) Association for the Development of Environmental Information (ADIE);
- (b) Central American Commission for the Environment and Development (SICA/CCAD);
- (c) Committee on Earth Observation Satellites (CEOS);
- (d) European Centre for Medium-Range Weather Forecasts (ECMWF);
- (e) European Environmental Agency (EEA);
- (f) European Space Agency (ESA);
- (g) European Organization for the Exploitation of Meteorological Satellites (EUMETSAT);
- (h) Food and Agriculture Organization of the United Nations (FAO);
- (i) Global Climate Observing System (GCOS);
- (j) Global Ocean Observing System (GOOS);
- (k) Global Terrestrial Observing System (GTOS);
- (l) Institute of Electrical and Electronic Engineers (IEEE);
- (m) Integrated Global Observing Strategy Partnership (IGOS-P);
- (n) Intergovernmental Oceanographic Commission (IOC);

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- (o) International Association of Geodesy (IAG);
 - (p) International Council for Science (ICSU);
 - (q) International Geosphere-Biosphere Program (IGBP);
 - (r) International Group of Funding Agencies for Global Change Research (IGFA);
 - (s) International Steering Committee for Global Mapping (ISCGM);
 - (t) International Strategy for Disaster Reduction (ISDR);
 - (u) Partnership for Observation of the Global Ocean (POGO);
 - (v) The Network of European Meteorological Services/Composite Observing System (EUMETNET/EUCOS);
 - (w) United Nations Educational, Scientific and Cultural Organization (UNESCO);
 - (x) United Nations Environment Programme (UNEP);
 - (y) United Nations Framework Convention on Climate Change (UNFCCC);
 - (z) United Nations Office for Outer Space Affairs (UNOOSA);
 - (aa) World Bank (IBRD);
 - (bb) World Climate Research Programme (WCRP);
 - (cc) World Meteorological Organization (WMO).

