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Global Ministerial Environment Forum**
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**Assessment, monitoring and early warning: State of the environment
Implementation of the programme of work of the United Nations
Environment Programme and the relevant decisions of the Governing Council**

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

Report by the Executive Director

Summary

The present document contains a summary of issues emanating from the activities of the United Nations Environment Programme (UNEP) in the area of assessment, monitoring and early-warning. The report covers several key aspects of the work performed by UNEP in keeping under review the world environmental situation through environmental assessment and early warning, thematic and regional assessments, and the multifaceted environmental challenges that face the United Nations and its Member States. At its ninth special session, the Governing Council/Global Ministerial Environment Forum has before it an unusually large and significant body of assessment findings which represent challenges with potential implications for Member States. Many of the challenges are described in more detail in related documents that are referred to in the present report. While it is incumbent upon the Executive Director to look back and report to the Governing Council on past activities and accomplishments, it is also his responsibility to look forward at new and innovative ways of tackling the substantive challenge of reporting on the environmental state of our planet.

* UNEP/GCSS.IX/1.

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I. Keeping the world environmental situation under review

1. The present report contains a summary of the state of the environment, responding to various decisions of the Governing Council/Global Ministerial Environment Forum and relating to UNEP activities in environmental assessment and early warning. It highlights findings of recently completed assessments such as the 2005–2006 GEO Yearbook, the Millennium Ecosystem Assessment and the Global International Waters Assessment (GIWA). It reviews progress on global and sub-global assessments currently under way, such as the Global Environment Outlook and the Global Marine Assessment, for which continuing support from Governments is necessary. The report also highlights some of the services provided by UNEP to Member States and other stakeholders at global and sub-global levels, including activities in the context of the Bali Strategic Plan for Technology Support and Capacity-building.
2. The current work of UNEP is being informed by the 2005 World Summit Outcome, adopted at the High-level Plenary Meeting of the United Nations General Assembly held in New York in September 2005, as well as progress being made in the implementation of the goals of the Millennium Declaration and other internationally agreed development goals and targets. The Goals and their implementation have been and continue to be highlighted in UNEP environmental assessments. The report is being submitted to the Governing Council/Global Ministerial Environment Forum at its ninth special session to update the Council/Forum on current developments in the global environmental situation and on the various activities and processes being undertaken to keep the state of the global environment under review and to facilitate informed discussion and action.
3. It is intended that the report will provide a basis for the deliberations of the Council/Forum under agenda item 4: Assessment, monitoring and early warning: state of the environment. It should be noted that this year the Council/Forum has before it an unusually large and significant body of assessment findings. The potential implications of these findings are outlined in chapter V of the report. It should also be noted that the Council/Forum has before it the report by the Executive Director on the proposed Environment Watch system (UNEP/GCSS.IX/3 and UNEP/GCSS.IX/3/Add2), which aims for improved coherence and effectiveness among activities for keeping the environment under review.

II. Findings of recent assessments

A. Annual Global Environmental Outlook reports

4. The GEO Year Book 2006, which is before the Council/Forum in document UNEP/GCSS.IX/INF/2, provides recent findings relevant to its considerations of the state of environment. The report comprises a global and regional overview, a feature focus, a chapter on emerging issues and a chapter on indicators. As requested in Governing Council decision 23/6 of 25 February 2005 and in support of the deliberations of the Council/Forum at the current session, the feature focus is on energy and air pollution. Prominent among the emerging issues highlighted in 2006 are the farming of marine species, and the impact of climate change on food production.
5. The feature focus provides information on the impact of energy-related indoor, outdoor and long-range air pollution on ecosystems and human health. It proposes a range of policy response options related to the following key findings:
 - (a) Indoor air pollution from solid fuel use may be responsible for 0.8–2.4 million premature deaths each year. Policies and programmes are needed to provide access to more efficient burning technologies and cleaner fossil fuels by poor households. The recent increase in energy prices could result in a reduction of fossil fuel subsidies for the poor in developing countries, forcing households back down what might be termed the “energy ladder” to the heavier use of biomass fuels;
 - (b) Long-range transport of energy-related air pollution poses several new challenges to policy makers. The impacts include increased acidification risks in some parts of the world due to rising sulphur dioxide emissions; damage to ecosystems due to increased emissions of nitrogen; deposition of pollutants such as mercury and persistent organic pollutants; a global cooling effect due to aerosols; and negative health impacts due to the transport of tropospheric ozone;
 - (c) Many cleaner technologies which expand energy access while reducing the impacts of air pollution already exist. Further work is needed, however, on technology transfer, finance and the introduction and enforcement of supportive policies;

(d) Investments in better energy technologies to tackle indoor and outdoor air pollution offer the possibility of substantial and important co-benefits, reducing health risks and damage to ecosystems, while reducing greenhouse gas emissions.

6. Turning to emerging issues, the practice of farming marine species – mariculture – is spreading rapidly. The chapter on marine culture assesses mariculture methods (marine net-pen rearing, ocean ranching, extractive aquaculture and intensive shrimp farming) for their environmental consequences, and suggests best practices to guide policy making.

7. The chapter on climate change and food production surveys recent scientific literature, with a view to assessing the overall impacts that global warming could have on food production. It looks at the possible impact that reduced crop productivity in vulnerable areas could have on increasing deforestation, as more land would need to be cultivated to produce the same amount of food.

B. One Planet, Many People: Atlas of Our Changing Environment

8. The publication, *One Planet, Many People: Atlas of Our Changing Environment*¹ was released on 3 June 2005 to mark World Environment Day. The atlas, developed by UNEP in cooperation with the United States National Aeronautics and Space Administration (NASA), the United States Geological Survey and the University of Maryland, provides a comprehensive, visual presentation of scientifically convincing data and information showing changes in the global environment – both good and bad – acquired and assessed through state-of-the-art technology. Intended for environmental policy makers, non-governmental organizations, the private sector, academics, teachers and the public at large, the atlas uses powerful satellite and geographic information system technology tools to tell the story of environmental change.

9. The 334-page book, containing 271 satellite images, 215 ground photos and 66 maps, clearly documents scientific evidence of global environmental change caused through natural processes and human-induced activities. More specifically, it generates awareness of how people's interaction with the environment alters it and provides indisputable evidence of over-exploitation of the environment and the consequences of such actions.

10. The atlas has already become one of the best selling books produced by UNEP, with more than 1,500 copies sold by September 2005.

C. Millennium Ecosystem Assessment

11. The Millennium Ecosystem Assessment, supported by UNEP and other partners such as the Global Environment Facility (GEF), was carried out over the period 2001–2005, to assess the consequences of ecosystem change for human well-being and to establish the scientific basis for actions needed to enhance the conservation and sustainable use of ecosystems and their contributions to human well-being. The assessment responded to requests by Governments for information through four international conventions (the Convention on Biological Diversity, the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, the Convention on Wetlands of International Importance especially as Waterfowl Habitat, and the Convention on the Conservation of Migratory Species of Wild Animals), as well as the needs of other users including, but not restricted to, civil society, the business community and indigenous peoples.

12. In March 2005, an overall synthesis report² was published, in addition to the staggered release of various synthesis reports targeted at specific audiences, on biodiversity, desertification, wetlands and water, business and industry, and health. The synthesis report, *Ecosystems and Human Well-being*, and the statement from the Board, “*Living Beyond Our Means: Natural Assets and Human Well-being*”, are before the Council/Forum in document UNEP/GCSS.IX/INF/8. The main findings of the Millennium Ecosystem Assessment include the following:

(a) Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fibre and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth;

¹ ISBN: 92 807 2571 8, Web: <http://www.na.unep.net/OnePlanetManyPeople/index.php>.

² ISBN: 1 59726 040 1, Web: <http://www.millenniumassessment.org/en/products.aspx>.

(b) The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at the cost of the increasing degradation of many ecosystem services, growing risks of non-linear, step changes and the exacerbation of poverty for some groups of people. Unless they are resolved, these problems will substantially diminish the benefits that future generations obtain from ecosystems;

(c) The degradation of ecosystem services could grow significantly worse during the first half of this century and represents a barrier to achieving the Millennium Development Goals;

(d) The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios that the Millennium Ecosystem Assessment has considered, but these involve significant changes in policies, institutions, and practices that are not currently under way. Many options exist to conserve or enhance specific ecosystem services in ways that reduce negative trade-offs or that provide positive synergies with other ecosystem services.

D. Global International Waters Assessment

13. The Global International Waters Assessment (GIWA)³ project, carried out with support of partners such as GEF, ended on 30 June 2005. The project, based on collaboration with water experts globally, collected data and information in 66 GIWA subregions on the state of international waters, freshwater basins, transboundary rivers, coastal marine waters and large marine ecosystems. A coherent methodology, which gives results that are comparable across the GIWA project, was developed and used to conduct regional assessments by 55 regional assessment teams.

14. GIWA focused on environmental aspects of water, comprising surface and ground waters as well as coastal and marine waters. It also looked at integrated coastal area and river basin management, which links freshwater and coastal and marine systems, highlighting land-based sources of activities affecting the quality and uses of the coastal and marine environment.

15. Fourteen reports were printed and published by the end of the project and another 13 were published on the website. Eleven other reports have been finalized and peer-reviewed but not yet published. The GIWA global report *Challenges to International Waters: Regional Assessments in a Global Perspective* is before the Council/Forum in document UNEP/GCSS.IX/INF/9. UNEP is also preparing for publication six other peer-reviewed regional reports, covering GEF-eligible countries.

16. The GIWA global report provides a comprehensive view of the most important findings on global and regional scales. On the global scale, the GIWA assessment has confirmed the widespread concern that pressures from human activity have weakened the ability of aquatic ecosystems to perform critical functions. The GIWA regional teams determined that transboundary pollution was a top priority concern in 20 of the 66 subregions. The transboundary pollution issue with the greatest impact is suspended solids. From the regional causal chain analysis, it appears that agricultural run-off and municipal and industrial discharges are the most prevalent pollution sources. Unsustainable use of freshwater is the top priority transboundary concern for the largest number of regions. Unsustainable exploitation of fish and other living resources is a top priority concern in 17 regions. Habitat modification has reduced biodiversity and changed community structures in many regions, causing significant social and economic losses. This is a top priority issue for another 17 regions.

17. GIWA outputs have already been used by some GEF projects as a basis for the development of new projects and activities such as those recently undertaken by the Lake Chad Basin Commission and the Pan-African System for Analysis, Research and Training (START) secretariat. GIWA has also provided significant input to intergovernmental processes such as the fifty-first ministerial meeting of the Lake Chad Basin Commission in 2004 and the Small Island Developing States ministerial conference in January 2005.

E. Biodiversity assessments

18. UNEP, through its biodiversity arm at the UNEP World Conservation Monitoring Centre (WCMC), has produced a number of assessments focusing on species and ecosystems biodiversity⁴ including:

³ <http://www.giwa.net/>.

⁴ UNEP-WCMC also provides assessment support to the multilateral environmental agreements, including work on the Global Biodiversity Outlook of the Convention on Biological Diversity, the CITES periodic trade

(a) The *World Atlas of Great Apes and their Conservation*⁵ which provides a comprehensive overview of what is currently known about all the six species of great apes – chimpanzee, bonobo, Sumatran orangutan, Bornean orangutan, eastern gorilla and western gorilla. It gives a thorough background on great ape behaviour and ecology, including detailed habitat requirements, their ecological role, and the possible consequences of their decline. The atlas shows that, despite the dedicated efforts of many individuals and organizations, the great apes all fall into the endangered or critically endangered categories of the World Conservation Union (IUCN) Red List. The publication offers a full description of the threats, current conservation efforts and additional protection needed for each species across its entire range;

(b) *Breaking the Waves: Assessment of the Buffering Capacity of Mangroves and Coral Reefs* is a response to the Indian Ocean tsunami. This booklet is aimed at policy makers, pulling together evidence regarding the value of coastal ecosystems in terms of coastal protection.

F. Small island developing States

19. UNEP, in partnership with collaborating centres in Africa, Latin America and the Caribbean, and Asia and the Pacific, published three environment outlook reports on the small island developing States, as part of its contribution to the International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, held in Port Louis, Mauritius, in January 2005. In addition to the environment outlook reports, UNEP also launched four GIWA regional reports on the Indian Ocean islands,⁶ Caribbean Sea small islands,⁷ Caribbean islands,⁸ and Pacific islands.⁹ These reports were published pursuant to various resolutions of the United Nations general Assembly and the Governing Council/Global Ministerial Environment Forum decisions, including decisions 22/13 of 7 February 2003 and SS.VIII/2 of 8 March 2004.

20. The environment outlook reports, Atlantic and Indian Oceans Environment Outlook,¹⁰ Caribbean Environment Outlook¹¹ and Pacific Environment Outlook,¹² are available in English, French, Portuguese and Spanish as appropriate. The drafts of the three reports were fed directly into preparatory meetings of the International Meeting and findings were incorporated into policy documents. Among other findings, the outlook reports highlighted that the situation in small island developing States continues to be one of exposure and growing vulnerability due to new challenges and emerging economic, social and ecological issues. Social and economic development depends on a limited range of natural resources and a healthy environment. Yet ecosystems and their goods and services are being

analysis and the Convention on the Conservation of Migratory Species (CMS) species assessment compilation. These three assessments will be finalized and made available in late 2005 or early 2006.

⁵ ISBN: 0520246330.

⁶ Indian Ocean Islands, GIWA Regional Assessment 45b. ISSN: 1651-940X, Web: <http://www.giwa.net/publications/r45b.phtml>.

⁷ Caribbean Sea/Small Islands, GIWA Regional Assessment 3a. ISSN: 1651-940X, Web: <http://www.giwa.net/publications/r3a.phtml>.

⁸ Caribbean Islands, GIWA Regional Assessment 4. ISSN: 1651-940X, Web: <http://www.giwa.net/publications/r4.phtml>.

⁹ Pacific Islands, GIWA Regional Assessment 62. ISSN: 1651-940X, Web: <http://www.giwa.net/publications/r62.phtml>.

¹⁰ ISBN: 9280725254, Web: http://www.unep.org/geo/pdfs/atlantic_eo.pdf.

¹¹ ISBN: 9280-725262, Web: http://www.unep.org/geo/pdfs/Caribbean_EO.pdf.

¹² ISBN: 9280-725246, Web: http://www.unep.org/geo/pdfs/Pacific_EO.pdf.

degraded under the pressure of social and economic driving forces at national, regional and global levels. Climate change impacts are already evident in regions of such States, with the frequency and intensity of extreme natural events increasing.

G. Antarctica

21. UNEP prepared the United Nations Secretary-General's report on the question of Antarctica, contained in document A/60/222, which was submitted to the General Assembly at its sixtieth session. The report reviews the work undertaken under the Antarctic Treaty system as well as other developments in Antarctica during the 2002–2005 period. The Antarctic Treaty system continues to provide an outstanding example of international cooperation, particularly in connection with the study of global changes. There are, however, issues of concern and challenges that need to be tackled. Illegal, unregulated and unreported fishing for toothfish in the Southern Ocean, for example, still exceeds reported catches despite major efforts to control such activities. The tourism industry has increased by some 300 per cent over the last 12 years. In addition, biological prospecting is an emerging issue. Efforts should continue to ensure that these commercial activities will not affect the successes of the Antarctic Treaty system, in particular in securing Antarctica as a natural reserve, devoted to peace and science. Global changes, in particular climate change and depletion of the ozone layer, remain major threats to the integrity of the Antarctic environment.

H. World Resources 2005

22. The report on world resources – *World Resources 2005 – The Wealth of the Poor: Managing Ecosystems to Fight Poverty*¹³ – was published in 2005. Born out of a partnership between UNEP, the United Nations Development Programme (UNDP), the World Bank and the World Resources Institute, the latest report stresses the urgent need for policy makers to look beyond aid projects, debt relief and trade reform and to focus on local natural resources to address the crisis of poverty across the globe. The report details how natural resources – soils, forests, water, fisheries – managed at the local level are frequently the most effective means for the world's rural poor people to create their own wealth. It is an important contribution to the work that UNEP is currently undertaking in the area of poverty and environment, pursuant to various decisions on that issue, such as decision 22/10 of 7 February 2003 and decision 23/10 of 25 February 2005. The report is the eleventh in a series of biennial reports on global environment and governance issues published since 1984. Since 1996, the series has been published jointly by the four partners, with a resulting synergy in global environmental assessment processes.

I. One Planet Many People: Images of Africa's Changing Lakes

23. The atlas of African lakes: *One Planet Many People: Images of Africa's Changing Lakes*,¹⁴ unveiled at the eleventh World Lake Conference in Nairobi, in October 2005, compares satellite images of the past few decades with those taken more recently. Environmental changes in Africa's lakes, which in many cases can only be truly appreciated from space, are brought into sharp focus.

24. Increasing water use and redistribution of freshwater flows, human-induced land and ecosystems changes, pollution, over-fishing, invasive species – combined with natural processes – have resulted in dramatic and sometimes extraordinary changes in lake ecosystems. Affected lakes include Lake Songor in Ghana, Lake Nakuru in Kenya, Lake Chad, Lake Victoria (Africa's largest freshwater lake) and many others. The atlas warns about the crucial importance of Africa's lake ecosystems for poverty alleviation and meeting internationally agreed development goals by 2015. Besides direct environmental impacts, economic and social implications are enormous. The unsustainable management of lakes may also result in increasing tensions and instability as rising populations compete for limited and deteriorating water resources.

25. The high-level segment of the African Ministers' Council on Water, held during the eleventh World Lakes Conference, recognized the importance of the Atlas of African Lakes as an essential tool for assessing and monitoring changes and management around African lakes. The atlas will be published in book form in 2006.

¹³ ISBN: 1-56973-582-4.

¹⁴ Web: <http://na.unep.net/AfricaLakes/>

III. Continuing assessment processes

A. Fourth Global Environment Outlook report

26. By its decision 22/1 I B of 7 February 2003, the Governing Council requested the Executive Director to prepare the comprehensive Global Environment Outlook report every five years, with the next report for 2007. Following a series of regional stakeholder consultations and expert meetings, the global intergovernmental and multi-stakeholder consultation on the fourth report in the Global Environment Outlook series (GEO-4), held in Nairobi on 19 and 20 February 2005, agreed on a statement¹⁵ on the scope, content, key questions and process of the GEO-4 assessment. It was agreed, among other things, that GEO-4 would assess the role of environment for development in relation to environmental and social changes that had taken place since the publication of the report of the World Commission on Environment and Development: *Our Common Future*, in 1987.

27. Furthermore, the Governing Council/Global Ministerial Environment Forum, in decision 23/6 of 25 February 2005, noted that statement and requested the Executive Director to develop the GEO-4 process as an integrated assessment of the global environment which involved Governments and built upon national, subregional and regional information, assessments and experiences, and strengthening as appropriate subregional and regional capacities. Pursuant to those decisions and consultations, UNEP has prepared a comprehensive implementation plan and developed a comprehensive chapter outline of the report.

28. A total of more than 200 scientists across the globe have been invited to research and draft the 10 chapters of the GEO-4 report. Separate working groups have been set up to work on the different chapters and these have defined the contents of each chapter based on the consultations referred to above. The GEO collaborating centre network, which has been the backbone of the assessment since its inception in 1995, continues to be a critical part of the process, providing inputs for both regional and global sections. In addition, more than 50 Governments have nominated about 200 experts to participate in the GEO-4 assessment. UNEP has also launched a fellowship programme, which provides young scientists, mainly from developing regions, the opportunity to participate in the different chapter working groups, and also to contribute in terms of research and drafting of the contents. About 40 young scientists are taking part in the GEO-4 assessment.

29. A new feature of the GEO-4 assessment is the establishment of strong links between GEO and institutions of the multilateral environmental agreements, with a view to facilitating enhanced policy analyses across the GEO-4 chapters. The statement by the Intergovernmental and Multi-stakeholder Consultation highlighted the need for the assessment process to show how the environment sector can most effectively ensure compliance with and enforcement of multilateral environmental agreements by policy makers.

30. A major strength of the current GEO-4 assessment is the continuing consultative process with Governments and other stakeholders. The Executive Director will invite Governments and other stakeholders to play an active part in the 2006 peer-review process – at both global and regional levels. To widen the ownership of the process and also to raise awareness among many different stakeholders, UNEP has developed a comprehensive outreach and strategic engagement strategy which is designed to strengthen participation in and the use of GEO-4 findings.

31. Outreach and strategic engagement activities will culminate in a GEO Forum – a major intergovernmental and multi-stakeholder event organized to consider the GEO-4 assessment findings and broaden its audience. Further in-kind and financial contributions will be sought in support of the major undertaking which this assessment process constitutes. GEO-4 will be published in September 2007, in line with the new five-year reporting cycle requested in Governing Council decision 22/1 I B.

B. International Assessment of Agricultural Science and Technology for Development

32. The objective of the International Assessment of Agricultural Science and Technology for Development is to undertake a global and five sub-global assessments of the role of agricultural knowledge, science and technology in reducing hunger and poverty, improving rural livelihoods, and facilitating equitable, environmentally, socially and economically sustainable development.

¹⁵ UNEP/GC.23/CRP.5.

33. Following a consultative process carried out between 2001 and 2003, a multi-stakeholder steering committee recommended that such an assessment was needed, that it should have an intergovernmental structure but with a multi-stakeholder advisory bureau and a secretariat based at the World Bank, and that it should be co-sponsored by other relevant United Nations agencies. The assessment now has a multi-stakeholder base, including the Food and Agriculture Organization of the United Nations (FAO), GEF, UNDP, UNEP, the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization (WHO) and the World Bank, and representatives of Governments, civil society, the private sector and scientific institutions from around the world.

34. The first intergovernmental plenary was held in Nairobi, Kenya, from 30 August to 3 September 2004, at which the following were agreed: the scope and structure of the assessment; the governance structure; the principles and procedures of the assessment; the establishment of an advisory bureau; a timetable for 2005–2007; a baseline budget of \$10.76 million and a financing mechanism.

35. The assessment is founded on a framework for conducting integrated agricultural assessments at local, national, regional and global scales, based on the Millennium Ecosystem Assessment framework. It will consist of a global assessment with three sections: historical perspectives; plausible futures (to 2050); and policy and institutional issues. It will also carry out five sub-global assessments in the following regions: sub-Saharan Africa; Central and West Asia and North Africa; East and South Asia and the Pacific; Latin America and the Caribbean; and North America and Europe. Summaries for decision makers will also be prepared.

36. Project activities started in late 2004, and global and sub-global design team meetings were held from January to April 2005, at which the annotated outlines for each assessment were developed. The outlines were approved by the assessment's advisory bureau following an integrated design team meeting, held in Montpellier, France, in May 2005. The nomination and selection of authors has been finalized and author meetings held between November 2005 and January 2006 to initiate the development of the first draft of each assessment. The further development of each assessment and an extensive peer-review process will take place in 2006.

C. GEO for Deserts

37. By its resolution 58/211 of 23 December 2003, the United Nations General Assembly established 2006 as the International Year of Deserts and Desertification. In response to this initiative, UNEP, in collaboration with a number of institutional and individual experts, is preparing a Global Environment Outlook for Deserts (GEO for Deserts), as one of the series of thematic GEO reports. The report will provide an experts' overview of the status and outlook on the world's deserts and inform decision makers and other readers about the development potentials and conservation needs of these very fragile ecosystems.

38. GEO for Deserts will examine the historical context, location and extent of the world's deserts, as well as the fragile ecologies and unique biota of deserts. The report also aims to highlight the importance of desert ecosystem services, such as crops, oil and mineral deposits and tourism, and the challenges faced by countries with desert areas and by their populations, and provide an outlook for the future.

39. A first workshop was held for the GEO for Deserts lead authors in September 2005 in Mendoza, Argentina, at which the production process of the report was launched. The first draft will go through a peer review in late January 2006. The final publication is to be launched on World Environment Day in June 2006.

D. Global Marine Assessment

40. At its sixtieth session, by resolution 60/30 of 29 November 2005, the General Assembly invited UNEP and the UNESCO Intergovernmental Oceanographic Commission (IOC), under the guidance of an ad hoc steering committee, to take the lead in the production of a so-called "assessment of assessments" as an initial phase in a planned global marine assessment process. The work will be carried out in cooperation with FAO, the International Maritime Organization (IMO), the World Meteorological Organization (WMO) and other institutions and partners.

41. The assessment of assessments will undertake the following tasks: assemble information about past or current assessments relevant to the global marine assessment; carry out a constructive appraisal of existing marine assessments, including coastal assessments; identify gaps and uncertainties in

scientific knowledge and current assessment practices; assess how these assessments have been communicated to policy makers at the national, regional and global levels; and produce a framework and options for the regular global marine assessment process.

42. The final assessment of assessments should include an indication of the following: available data that can be incorporated into the regular process, drawing together existing scientific and technical data and information; usefulness and constraints posed by organizing assessment components of the regular process at different scales; assessment components at different scales and how these could relate to integrated assessments; existing gaps and their implications for the regular process; capacity that needs to be built to support the regular process; framework and options to move forward on building a regular process for global reporting and assessment of the state of the marine environment, including social and economic aspects; and, potential costs of the regular global marine assessment process.

43. By resolution 60/30, the General Assembly also decided that the execution of the two-year "assessment of assessments", including the activities of the ad hoc steering group and the group of experts, should be financed through voluntary contributions and other resources available to participating organizations and bodies. Member States in a position to do so were invited to contribute financially in order to ensure the successful implementation of the process. In that connection, the Executive Director would like to draw the attention of Member States to the established UNEP global marine assessment trust fund.

E. Sub-global assessments

1. Africa

44. The preparation of the second Africa Environment Outlook (AEO-2) report has been completed. AEO-2 highlights the central role which Africa's environment continues to play in sustaining livelihoods and discusses opportunities available for African people to use their environmental resources to reduce absolute poverty. Its recommendations were unanimously adopted by the African ministers of environment on 15 March 2005 during the ministerial segment of the second Partners' Conference on the Environment Initiative of the New Partnership for Africa's Development (NEPAD), held in Dakar, Senegal.

45. The report has benefited from contributions by more than 100 African experts and 36 national institutions. To enhance national input to AEO-2, training in integrated environmental assessment and reporting methodologies was carried out for all 53 countries in Africa, through the AEO collaborating centres, during the course of drafting the report. Two of the subregional reports compiled to provide input into AEO-2 are being developed into fully fledged subregional environment outlook reports for Southern and Eastern Africa.

46. The GEO Cities process was launched in Dakar, Nairobi and Lusaka in close collaboration with the United Nations Human Settlements Programme (UN-Habitat), under the Sustainable Cities Programme.

47. The Africa Environment Outlook for Youth project was initiated in 2003. By working through six subregional frameworks and 41 national focal points, it has been possible to achieve a bottom-up structure, ensuring the full participation of youth at the grass-roots level. The report had been approved for publication by the UNEP Publishing Board.

2. Asia and the Pacific

48. UNEP, together with subregional partners, has initiated the Central Asia integrated environmental assessment reporting process. The report will review the environmental situation in the five countries in the Central Asia subregion. The outline was endorsed by the Ministerial Meeting of the Inter-State Sustainable Development Commission in Ashgabat, Turkmenistan, on 18 June 2005, and the report will be published in 2006.

49. UNEP is providing technical support to Bhutan, Cambodia, the Islamic Republic of Iran, Kyrgyzstan, Tajikistan and Turkmenistan in using integrated environmental assessment methodologies for environmental assessments at the national level. National reports for Cambodia and Tajikistan have already been completed. UNEP is also assisting the cities of Dhaka (Bangladesh), Katmandu (Nepal) and Shenzhen (China) to apply integrated environmental assessment methodologies to environmental assessments at the city level.

3. Europe

50. The Carpathian Environment Outlook (KEO) is an integrated environmental assessment reporting process launched by UNEP in March 2004. The KEO report will be a subregional examination and synthesis of the environmental situation in the greater Carpathian region and will cover parts of seven countries (the Czech Republic, Hungary, Poland, Romania, Serbia and Montenegro, Slovakia and Ukraine). Preparation of the KEO report will be carried out in a bottom-up, collaborative and consultative manner, much like its parent products, the global GEO assessment reports. It is anticipated that with inputs and authorship being provided by all seven Carpathian countries, the KEO report will be ready by early 2007.

51. UNEP is collaborating closely with the European Environment Agency (EEA), both in the production of GEO-4 and also on the Agency's next pan-European report on environmental state and trends, which is being prepared for the fifth Environment Ministers Conference in late 2007. Among other activities, UNEP is supporting the data collection work and development of environmental indicators for the countries of Eastern Europe, the Caucasus and Central Asia.

4. Latin America and the Caribbean

52. During the week of World Environment Day in June 2005, the Bahamas launched its first ever national state-of-the-environment report, developed using the GEO methodology. The GEO Mexico report, also finalized in 2005, has been distributed widely both within and outside the country. Mexico was the first country in the region to produce a GEO-type report with quantitative scenario analysis. Honduras and the Bolivarian Republic of Venezuela started their integrated environmental assessments in 2005. At the subregional level, the GEO Central America process was launched during the Donor Forum of the Central American Commission for Environment and Development (CCAD) in October 2005 in Nicaragua. An assessment of the countries of Mercosur – the Southern Cone Common Market – with a special focus on “trade and environment”, is currently under way.

53. The GEO Health Project is an integrated environment and health assessment that has been under way since 2004 in collaboration with the Pan-American Health Organization (PAHO). The project was presented at a technical workshop organized in the framework of the Meeting of the Health and Environment Ministries of the Americas in Mar del Plata, Argentina, in June 2005. The Declaration of Mar del Plata, adopted in Mar del Plata at the Fourth Summit of the Americas on 5 November 2005, requested UNEP and its partner agencies such as PAHO to continue their existing inter-agency initiatives.

54. The GEO Cities methodology was developed by UNEP and regional partners to allow for integrated environmental assessment at the urban level. The first phase of the project started in 2001, involving seven cities.¹⁶ The second phase commenced in 2003, with another 20 cities in the region.

55. Regional workshops are organized periodically to keep the project partners updated on methodologies and tools and to encourage cross-fertilization of assessment experiences. Partners from 25 cities in Latin America and the Caribbean and representatives from other regions such as Africa, Asia and Europe participated in the third workshop, which was held prior to the 2005 World Environment Day celebration.

56. Strong partnerships have been established with other agencies and organizations working on urban-related issues, including the International Development Research Centre, the International Institute for Sustainable Development, the International Council for Local Environmental Initiatives, and UN-Habitat.

5. West Asia

57. UNEP is providing guidance and technical support to Bahrain, the Syrian Arab Republic, Yemen and the United Arab Emirates in the development of national and sub-national state-of-the-environment reports. Training materials on the integrated environmental assessment methodology and tools are provided, along with sample reports from around the world, the knowledge base on internet resources and access to the UNEP pool of regional and global individual and institutional experts. The reports will be published in 2006.

¹⁶ Rio de Janeiro (Brazil), Manaus (Brazil), Buenos Aires (Argentina), Havana (Cuba), Bogota (Colombia), Mexico City (Mexico), and Santiago (Chile).

58. UNEP, together with partners in Egypt, Morocco and Saudi Arabia, has been coordinating the Arab Millennium Ecosystem Sub-global Assessment.

IV. Providing services to Governments

A. Environmental data and information

59. The GEO data portal is continually updated and upgraded by UNEP. This is an authoritative source for data sets used by UNEP and its partners in the GEO report and other integrated environmental assessment processes. The on-line database holds more than 450 different variables, as national, subregional, regional and global statistics or as geospatial data sets (in the form of maps), covering a wide variety of environmental, social and economic themes such as fresh water, population, forests, emissions, climate, disasters and health.¹⁷ These can be displayed as maps, graphs or raw values and the data downloaded in different formats.

60. Regional demonstrations of the GEO data portal are being prepared for developing regions in close cooperation with the central GEO data portal hosted by the European node of the UNEP Global Resources Information Database (GRID-Geneva). They will provide improved access to data to support integrated environmental assessments and reporting activities in the regions.

61. Within the framework of AEO, the Africa Environment Information Network (AEIN) aims to strengthen national capacities in information management. It has been consolidated in 12 pilot countries to include the production of national integrated environmental assessment reports for Burkina Faso, Egypt, Ethiopia, Gabon, Ghana, Senegal, Tunisia, Uganda and Zambia. Similar support has been extended to other countries, such as Congo, Eritrea, Kenya, Nigeria and South Africa, which have also adopted the integrated environmental assessment methodology. The AEIN initiative has played a key role in developing harmonized tools for both data management and information dissemination. The knowledge base information system, packaged in a CD-ROM, documents experiences and expertise in integrated environmental assessment and reporting at the national levels to promote the sharing of experience in Africa.

62. In West Asia, UNEP is a strategic partner in the Abu Dhabi Global Environmental Data Initiative (AGEDI), supporting regional and national efforts in environmental information development and management. UNEP coordinated a regional and a global study for AGEDI. The global study included a global environmental data and information systems knowledge base, global lessons learned for the design of environmental information systems and a conceptual design document for AGEDI. Development of a UNEP-AGEDI regional strategy for environmental information is currently under way.

63. An environmental knowledge base for the 12 countries in the West Asia region has been prepared in the form of a set of 12 compact disks, containing documents and information resources available to key environmental agencies and partner institutions in the region. Guidelines on the development and use of core environmental indicators for West Asia are also available.

B. Global Earth Observation System of Systems

64. UNEP is actively supporting the Group on Earth Observations process and the implementation of the Global Earth Observation System of Systems (GEOSS) 10-year plan, adopted at the Third Earth Observation Summit in Brussels in February 2005. The plan is articulated around nine social benefit areas:

- (a) Reducing loss of life and property damage due 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 a better understanding of water resources;
- (f) Improving weather information, forecasting and warning;
- (g) Improving the protection and management of terrestrial, coastal and marine ecosystems;

¹⁷ Available at <http://geodata.grid.unep.ch/>.

- (h) Supporting sustainable agriculture and combating desertification;
- (i) Understanding, monitoring and conserving biodiversity.

65. Once operational, GEOSS will make a major contribution to keeping the world environmental situation under review and ensuring the timely identification of emerging environmental problems of wide international significance. It is important that Governments around the world are in a position to gain maximum benefits from the data and other services once these become available through GEOSS. To position itself to assist Governments in this respect, UNEP is already participating in several of the GEOSS working groups (in particular, those on science and technology, user interface and capacity-building and outreach), and is in the process of linking the GEOSS initiative to early warning and data/information activities in the context of the Bali Strategic Plan for Technology Support and Capacity-building.

66. The free global Landsat data sets provided to UNEP by NASA comprise more than 17,000 images from 1970, 1990 and 2000. They constitute a unique source of information, which can be used to analyse environmental change and provide early warning of emerging environmental threats. The data have been offered to 115 countries, and 72 of those have so far accepted the offer. As of October 2005, 61 countries had received Landsat data. In conjunction with the distribution of these data, technology support courses are also being arranged on the interpretation and use of the satellite data and related information management.

67. To facilitate the implementation of the Bali Strategic Plan objectives, particularly in relation to technology support, Governments which have not yet responded to the offer of data sets can still do so. Those Governments which have already responded and have received training in the use of the data sets may also wish to ensure that the satellite imagery is used in their national environment outlook reports.

C. Environment and conflict prevention

68. UNEP launched its initiative on environment and conflict prevention in December 2003. Since then an expert group has been established on the initiative, which held its first meeting in March 2005. Work has begun on a regional assessment on environment and conflict prevention in Latin America and the Caribbean and similar activities are planned in Asia and the Pacific and Africa. The compiled reports of the assessments will be submitted as an information document to the Governing Council at its twenty-fourth session in 2007.

D. Provision of guidelines, manuals and training

69. Capacity-building is a critical component of the UNEP portfolio in the fields of environmental assessment, trend analysis and reporting. A recent needs assessment conducted in parallel with the consultation on the Environment Watch proposal clearly shows a continuing demand at all levels for this type of knowledge and expertise. In addition to hands-on capacity-building, such as the fellowship programme mentioned above in connection with GEO-4, UNEP is actively engaged in the development of integrated environmental assessment manuals, guidelines and data analysis tools and the transfer of skills and expertise through targeted training. Such activities fall within the mandate of the Bali Strategic Plan for Technology Support and Capacity-building and will be part of its future implementation. Further information on this matter may also be found in document UNEP/GCSS.IX/3/Add.1.

70. Synergy between global and regional processes in the development of guidelines and other tools is provided through a GEO capacity-building working group, bringing together UNEP, selected GEO collaborating centres and individuals with specialized capacity-building expertise.

71. A new training manual on integrated environmental assessment and reporting is nearing completion and will form the basis for much of the future national level capacity-building. The manual includes gender guidelines and is complemented by an instructors' manual. The modular design of the manual will lend itself to regional customization to ensure maximum relevance to user groups. Meanwhile networks of training partners are being established in the regions. Africa, for instance, has a network of skilled partners drawn from the six sub-regions.

72. Capacity-building efforts are also being targeted at specialized areas. UNEP-WCMC, for example, has coordinated a project on biodiversity indicators for national use, which has developed operational national-level biodiversity indicators to support planning and decision-making in the four participating countries: Ecuador, Kenya, Philippines and Ukraine. The project includes wider dissemination of the approaches which it has developed, so as to support the production of biodiversity

indicators by other countries and at global level under the Convention on Biological Diversity. UNEP-WCMC has also produced specialized guidelines on biodiversity assessment and monitoring for protected areas.

V. Conclusions and potential implications of key assessment findings for Governments

73. The assessment reports finalized in the period between the twenty-third regular session and the ninth special session of the Governing Council collectively represent substantial financial investments by the international community and reflect in-kind contributions from Governments and thousands of experts worldwide. They bring forward an unusually large and significant number of findings, which may have implications for Governments and for UNEP programmatic activities. Accordingly, the Executive Director will take these findings into account in implementing the programme of work for 2006–2007 and in preparing the draft programme of work for 2008–2009. Governments may also wish to consider the following key findings and identify appropriate ways to deal with them individually or collectively, through the appropriate international mechanisms, including by the Governing Council/Global Ministerial Environment Forum at its twenty-fourth session in 2006:

(a) The fact that indoor air pollution from solid fuel use may be responsible for between 800,000 and 2.4 million premature deaths each year, as pointed out in the *Global Environment Outlook Yearbook 2006*, and the awareness that long-range transport of energy-related air pollution leads to: acidification in some parts of the world due to rising sulphur dioxide emissions; damage to ecosystems due to increased emissions of nitrogen; deposition of pollutants such as mercury and persistent organic pollutants; and negative health impacts due to the transport of tropospheric ozone. Governments may individually or collectively, including through regional environmental ministerial forums, wish:

- (i) To undertake indoor and outdoor air pollution abatement, including setting and enforcing national and regional air quality standards, as such investments most often outweigh the costs of damage caused by the pollution and offer multiple benefits such as reducing health risks and damage to ecosystems, while reducing greenhouse gas emissions;
- (ii) To implement measures, including through international cooperation, economic tools and supportive policies, to promote the use of existing technologies which expand energy access while reducing the impacts of air pollution, including the use of cleaner household energy technologies by the poor;
- (iii) To undertake regular monitoring of air quality, including harmful pollutants such as small particulates which are not measured on a regular basis in some parts of the world;
- (iv) To ensure the participation of affected groups and user groups in programmes for the control of indoor and outdoor air pollution, including encouraging local entrepreneurship in the introduction of new technologies to control indoor air pollution;
- (v) To undertake prioritized action on measures that have a profound impact on reducing air pollutants and their negative impacts, such as the removal of lead from gasoline in countries where this has not already taken place;

(b) The emerging issues examined in the *Global Environment Outlook Yearbook 2006*, which are the environmental effects of the practice of farming of marine species and the overall impacts of global warming on food production. Governments may individually or collectively, in appropriate international forums, wish:

- (i) To disseminate relevant information to decision makers and practitioners and promote the use of integrated and adaptive marine farming systems that reduce waste, protect ecosystem services, better control pollutants and use the most regionally appropriate species;
- (ii) To note the emerging scientific evidence on climate change and food production. The International Assessment of Agricultural Science and Technology for Development and the fourth assessment of the Intergovernmental Panel on Climate Change could be encouraged to take such emerging evidence into account;

(c) The evidence of environmental change provided in the atlas *One Planet, Many People* and the need to strengthen the international system for keeping such changes under review in order to be able effectively and adequately to mitigate or adapt to them at all levels. The proposed Environment Watch system and the Global Earth Observation System of Systems are mutually supportive and could address this need, and Governments, the scientific community and partners could be called on to play an active role in their incremental development;

(d) The fact that 60 per cent of the ecosystem services examined by the Millennium Ecosystem Assessment are being degraded or used unsustainably, including freshwater, capture fisheries, air and water purification and the regulation of regional and local climate, natural hazards and pests. The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to the attainment of the Millennium Development Goals and other internationally agreed development goals. Governments may individually or collectively, including through the biodiversity relevant multilateral environmental agreements, wish:

- (i) To consider changes in institutional and governance frameworks for more effective management of ecosystems, such as:
 1. Further integration of ecosystem management goals within other sectors and broader development planning frameworks;
 2. Increased coordination between multilateral environmental agreements and other international economic and social institutions;
 3. Greater transparency and accountability in ecosystem-related decision-making processes, with greater involvement of concerned stakeholders;
- (ii) To make greater use of economic instruments and market mechanisms to regulate and manage ecosystems and their services. Many ecosystem services, such as flood regulation or erosion control, are not traded in markets. Possible mechanisms include “cap and trade” systems, which are already used for some pollutants, payments for ecosystem services from “buyers” interested in the maintenance of those services to “sellers” who can act to ensure such maintenance, and taxes or user fees to account for all impacts and tradeoffs from specific activities;
- (iii) To influence social and behavioural responses, in order to reduce consumption of degraded ecosystem services and achieve sustainable use, through communication and education to raise public awareness and through the empowerment of groups such as women, indigenous people and youth who may be particularly dependent on ecosystem services or affected by their degradation;
- (iv) To stimulate the development and diffusion of technologies designed to increase the efficiency of resource use or reduce the impacts of drivers such as climate change and nutrient loading;
- (v) To promote research and monitoring activities towards the development of indicators for the 2010 biodiversity target of the Convention on Biological Diversity, and also recurrent, complementary and integrated assessments on all scales but with particular emphasis on the need for information at the national and subnational levels;
- (vi) To appreciate the focus on the role of ecosystem services for human well-being in GEO-4 and in the International Assessment of Agricultural Science and Technology for Development to be published in 2007. Governments and stakeholders could be called upon to take an active part in peer review and consultations under the two assessments in 2006 and to make in-kind and financial contributions to the processes;

(e) The assessment of 66 subregions covering international river basins and adjacent seas conducted by GIWA has confirmed the widespread concern that pressures from human activities have weakened the ability of aquatic ecosystems to provide critical services. Transboundary pollution issues are among the top priority concerns in 20 of the subregions, the most prevalent sources of pollution are agricultural runoff and industrial and municipal discharges, while unsustainable use of freshwater and living resources also score high on the priority list. Governments may individually or collectively, including through relevant international water agreements and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, wish:

- (i) To consider the key findings from the GIWA regional reports and maintain the existing GIWA regional networks in order to ensure better monitoring and mitigation of further deterioration of the aquatic environments and their resources, including as a basis for implementing the target under Millennium Development Goal 7 to, by 2015, reduce by half the proportion of people without access to safe drinking water;
 - (ii) To promote research, monitoring, use of indicators and recurrent complementary integrated assessments of international waters at all scales, but with particular emphasis on the need for information at regional, national and local level and for mainstreaming water ecosystem concerns into sectoral plans and policies. In particular, there is a need to proceed with the development of the Global Marine Assessment as called for in General Assembly resolution 60/30. Donors and financial institutions, including GEF, could be called upon to support such activities.
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