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**Science-policy interface on biodiversity and ecosystem services:
gap analysis****Executive summary****I. Introduction**

1. Over the past decades the international community has established a number of regimes to conserve and use sustainably biodiversity and ecosystem services. These efforts have led to the development of a considerable, continuously evolving and ever-more complex system of environmental governance. Nonetheless, notwithstanding significant progress in science and the increasing recognition of the importance of using science effectively in decision-making, biodiversity and ecosystem services continue to be used unsustainably and inequitably, and are being degraded at increasing rates.
2. The Millennium Ecosystem Assessment showed that over the past 50 years humanity has caused unprecedented losses in biodiversity and declines in ecosystem services. Of the 24 assessed ecosystem services, 60 per cent recorded a decline, with further degradation expected unless immediate action is taken. This is expected to have a negative impact on development processes in all countries, but in particular in developing countries, and is impeding the attainment of both the Millennium Development Goals and the internationally agreed target to reduce significantly the rate of biodiversity loss by 2010.
3. While there are many reasons for this situation, there is growing consensus that strengthening the interrelations between science and policy at all levels is necessary (but not sufficient) for more effective governance of biodiversity and ecosystem services. Current environmental problems, often of considerable magnitude and complexity, challenge science, politics, policy and their interrelations in unprecedented ways, confronting them with situations in which facts are uncertain, values in dispute, stakes high and decisions urgent.
4. In recent years considerable attention has been paid to tackling inadequacies in the interrelations between science and policy, insofar as this is possible within given mandates, budgets and decision-making processes, and to exploring options for a more effective science-policy interface, as in the case of the ad hoc international and multi-stakeholder meeting on an intergovernmental

science-policy platform on biodiversity and ecosystem services, convened in Putrajaya, Malaysia, from 10 to 12 November 2008.¹

5. In the Putrajaya Road Map, set out in the annex to the report of the meeting (document UNEP/IPBES/1/6), participants recognized that mechanisms to improve the science-policy interface for biodiversity and ecosystem services for human well-being and sustainable development should continue to be explored and called for a gap analysis to be undertaken with the aim of supporting future discussion by reviewing the strengths and weaknesses of existing science-policy interfaces and the coordination between them across all spatial scales. They requested a preliminary report to be made available at the twenty-fifth session of the United Nations Environment Programme (UNEP) Governing Council/Global Ministerial Environmental Forum, in February 2009. At that meeting, representatives called upon UNEP to complete the gap analysis for presentation at the next ad hoc intergovernmental and multi-stakeholder meeting, building on comments received through an open review process.

6. The full gap analysis builds on the preliminary version, incorporating the comments received during the review process and further drawing on scientific literature, policy reports, institutional research and consultations with experts.

7. In answering the mandate accorded by the Governing Council and the related discussions, the objectives of this analysis are:

(a) To review the institutional landscape relevant to the discussion and to analyse the strengths and weaknesses of existing science-policy interfaces and coordination between them at the national, regional and global levels of governance;

(b) To present the findings of this review and analysis in such a manner as to help to orient future discussion on strengthening the science-policy interface on biodiversity and ecosystem services.

II. Key findings

8. The gap analysis identified six key findings, ranging from the complexity of science-policy interfaces to the lack of coordination between the many stakeholders in covering the broad spectrum of biodiversity and ecosystem services in a comprehensive manner, which is essential for effective policymaking in the development field.

A. Finding No. 1: Multiple science-policy interfaces

9. A wide range of science-policy interfaces of varying types, sizes and purposes already exist for the many multilateral environmental agreements and other bodies relating to biodiversity and ecosystem services at all levels. Between them they have, to a certain extent, enriched decision-making and raised awareness of biodiversity and ecosystem services among the environmental community.

10. The specific findings are as follows:

(a) *Finding No. 1.1:* The existing landscape of science-policy interfaces and interactions provides an important basis that can be built upon and strengthened;

(b) *Finding No. 1.2:* The variety of existing science-policy interfaces is in part historic as institutions have been created on an ad hoc basis to deal with problems and issues as they have emerged. Much of this variety is, however, likely to be inherent, given the complexity of governance arrangements, the multiple levels of governance, the broad range of sectoral interests and the variety of purposes.

¹ While much of this is described in the gap analysis proper, particularly relevant to the current discussions on strengthening the science-policy interface on biodiversity and ecosystem services is the “assessment of assessments” reviewing the global marine assessment landscape for the purpose of determining possible options and a framework for a regular process for global reporting and assessment of the state of the marine environment. This process is currently in an advanced and critical phase, with a meeting of the Ad Hoc Working Group of the Whole convened by the General Assembly in paragraph 157 of its resolution 63/111 of 5 December 2008 to be held in New York from 31 August to 4 September. The Working Group plans to submit its proposals to the General Assembly at its sixty-fourth session.

B. Finding No. 2: Effectiveness of science-policy interfaces

11. Notwithstanding the progress made by many of the existing science advisory bodies to improve the focus and quality of scientific inputs into policymaking processes, there is scope for further improvement in scientific independence through increased credibility, relevance and legitimacy.

12. The specific findings are as follows:

(a) *Finding No. 2.1:* Most science-policy interfaces have relatively modest budgets for the size of the task that they are expected to perform, potentially limiting their ability to assess knowledge comprehensively and ensure the input of the best available science, leaving them to rely on inputs from other bodies and processes that might not be best suited to their needs;

(b) *Finding No. 2.2:* Each science-policy interface works in a separate manner and each mechanism can bring its own limitations, such as the problems that can be encountered when an advisory body is responsible for providing scientific input to the policy process while acting as an initial negotiating platform.

C. Finding No. 3: Common and shared knowledge base

13. Although an extensive knowledge base exists to support decision-making in each of the many science-policy interfaces, shared frameworks, methodologies and basic understandings to respond to the complex nature of biodiversity and ecosystem services issues remain missing or incompletely implemented. There are also significant gaps in knowledge that need to be filled.

14. The specific findings are as follows:

(a) *Finding No. 3.1:* Notwithstanding the considerable progress in and growth of the relevant sciences, some fundamental knowledge gaps exist, in particular with regard to the dynamic interactions between drivers of change, ecosystems and human well-being. This is of particular concern at the regional, national and local scales, where many of the most important interactions of this nature occur and where human well-being depends most directly on ecosystem services;

(b) *Finding No. 3.2:* Although a range of institutions support the development of research strategies to meet policy needs, there is currently no process providing common and regularly reviewed guidance on a strategic approach to research to ensure that the most important needs in terms of knowledge to support more effective governance at all levels are being identified and responded to in a coordinated manner;

(c) *Finding No. 3.3:* While awareness of the need to draw more systematically on a broad range of knowledge types is growing, there remains a lack of processes for ensuring the effective incorporation of types of knowledge into the knowledge base, including the incorporation of knowledge from other sectors and disciplines, non-formal knowledge and mutual learning;

(d) *Finding No. 3.4:* Notwithstanding continuing efforts, there remain significant gaps in long-term observation and monitoring programmes, in particular as regards data and information on interactions between drivers of change, ecosystems and human well-being, and on particular geographic regions;

(e) *Finding No. 3.5:* While progress has been made, there remain significant barriers to the effective use of existing data and knowledge resulting from institutional and technical impacts on both the availability of data and information and on the ability of users to gain access to such data and information in meaningful ways.

D. Finding No. 4: Policy impact

15. Various mechanisms synthesize, present and communicate knowledge to inform policy. There is, however, a lack of regular processes providing periodic, timely and policy-relevant information covering the full range of biodiversity and ecosystem service issues to the broader development community. This information and knowledge is not always translated and communicated in the most efficient way or the most useful format.

16. The specific findings are as follows:

(a) *Finding No. 4.1:* As a result of the vast quantity and varying quality of differing, fragmented and sometimes even contradictory knowledge currently available, together with the lack of clear authoritative synthesis and a clear and targeted communication thereof, decisions taken are not

necessarily informed by the best available knowledge;

(b) *Finding No. 4.2:* Knowledge is often not presented in the form of clear policy alternatives that systematically outline the implications of policy options under detailed framing assumptions and provide better guidance in policy implications;

(c) *Finding No. 4.3:* In discussions on science-policy interfaces there is far more focus on identifying issues and formulating policies with regard to multilateral environmental agreements at the global level than on supporting policy implementation and policy evaluation, particularly at the national and regional levels of governance, and on the extent to which effective information and advice pertains to and is used by the development community at the lower governance levels;

(d) *Finding No. 4.4:* There is a need for more integrated quantitative models, scenarios and indicators that will aid understanding of not only biodiversity and ecosystem services, but also the relevance of biodiversity and ecosystem services to human well-being;

(e) *Finding No. 4.5:* Notwithstanding the range of assessments relating to biodiversity and ecosystem services, no regular periodic multi-level assessment process exists that provides the conceptual and institutional framework coherently to gather, review, synthesize, communicate and monitor information and track changes in biodiversity and ecosystem services and their consequences for human well-being at the global, regional and national levels and on the interrelation across these levels;

(f) *Finding No. 4.6:* There are continuing difficulties in ensuring timely scientific advice on emerging issues of concern at and across all levels, whether in response to policymakers' requests or resulting from concerns arising from the scientific community.

E. Finding No. 5: Coordinated approach

17. Notwithstanding the existence of several mechanisms to improve the coordination of the wide range of science-policy interfaces for the many multilateral environmental agreements and other bodies related to biodiversity and ecosystem services, there is significant room for building on the existing experiences that would lead to better coordination between and across global and national mechanisms.

18. The specific findings are as follows:

(a) *Finding No. 5.1:* There is significant potential to improve the effectiveness of science-policy interfaces through more coherent coordination within and across their various functions, integrating such aspects as research strategies, models and scenarios, assessments, knowledge-brokering and capacity-building;

(b) *Finding No. 5.2:* Examples exist of thematic mechanisms such as expert groups or other collaborative arrangements that are providing valuable support to policy formulation and implementation on specific issues. Lessons can be learned from this;

(c) *Finding No. 5.3:* There is a lack of coordination across sectors to allow for the constant exchange and joint creation of knowledge, leading to mismatches and duplications of information and policies relevant to the broader development community;

(d) *Finding No. 5.4:* There is a lack of coordination across levels of governance to allow for the effective exchange of knowledge and experience back and forth across relatively diverse science-policy interfaces from the national to the global level that is necessary to avoid mismatches and duplications and to increase synergies between them.

F. Finding No. 6: Fundamental capacities

19. Numerous institutions and processes are helping to build capacity to use science effectively in decision-making at all levels. Further efforts, however, are required to integrate multiple disciplines and knowledge systems to produce relevant knowledge effectively; to translate knowledge into policy action and to coordinate these processes; and to build the capacities of developing countries to use science more effectively in decision-making and to participate fully in the science-policy dialogue.

20. The specific findings are as follows:

(a) *Finding No. 6.1:* Notwithstanding continuing efforts and improvements in capacity-building supporting the various processes of interfacing science and policy, there remains a significant and widespread lack of capacity in interdisciplinary approaches for knowledge production relevant to biodiversity and ecosystem services for human well-being and governance that draw upon a

variety of knowledge systems;

(b) *Finding No. 6.2:* There is a widespread lack of capacity for brokering knowledge effectively so that it is used appropriately in decision-making, including by identifying the implications of various policy options;

(c) *Finding No. 6.3:* There are geographical variations in capacity relevant to science-policy interfaces, with significantly reduced capacity in developing countries, and in particular the less developed countries and small island developing States, impeding these countries' full engagement in nearly all relevant processes.
