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The Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services: moving a step closer to an IPCC-like mechanism for biodiversity

 Anne Larigauderie¹ and Harold A Mooney²

Efforts to establish an ‘IPCC-like mechanism for biodiversity’, or an IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services), may culminate soon – as governments, the scientific community and other stakeholders are getting ready for a third round of negotiations on IPBES. This paper provides firstly, a brief history and broader context for the IPBES process; secondly, a description of the niche that IPBES would occupy in the science-policy landscape for biodiversity and ecosystem services; and thirdly, concludes with some views on the role of scientists in IPBES, and on the need to have strong and proper scientific structures to coordinate scientific efforts internationally, in order to produce the science needed for IPBES.

Addresses

¹ DIVERSITAS, 57, Rue Cuvier – CP 41, 75231 Paris Cedex 05, France

² Department of Biology, Stanford University, Stanford, CA 94305, USA

 Corresponding author: Larigauderie, Anne (anne@diversitas-international.org) and Mooney, Harold A (hmooney@stanford.edu)

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Introduction

Efforts to establish an ‘IPCC (Intergovernmental Panel on Climate Change)-like mechanism for biodiversity’, or, as it is now known, an IPBES (Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services), may culminate soon – as governments and other stakeholders are getting ready for a third, and what is hoped to be, a final round of negotiations on IPBES. These negotiations will take place, possibly as soon as June 2010, for a likely launch during the course of 2010, the International Year of Biodiversity.

Loreau *et al.* [1^{**}], and more recently, Mooney and Mace [2^{**}] have explained why, in their views, an assessment mechanism for biodiversity and ecosystem services that is an IPBES, is needed. They underline the lack of adequate responses by our societies to the deterioration of biodiversity as highlighted by the MA (Millennium

Ecosystem Assessment) report [3^{**}], and argue that not only more science but also more relevant scientific information, and a more structured dialog between the scientists and policy makers are needed to trigger societal responses and inform decision making. Accordingly, the vision for IPBES is that of a mechanism, which would provide on a regular basis, global and regional trends in biodiversity and associated ecosystem services, analyse their causes, and explore possible future changes, in order to inform decision making.

Analogies are often drawn between the IPCC and a possible IPBES. Two key elements, among others (e.g. the quality of the scientists involved, the independence of the scientific work), have contributed to the success of IPCC: firstly, its intergovernmental nature, ensuring that governments request the scientific information produced and approve it by consensus, making the reports legitimate and their results more likely to be used; and secondly, its periodic nature, which has over the years, mobilised public opinions and structured the scientific community around a set of common goals resulting in faster progress in climate science, and in more policy relevant science.

As background for the upcoming 3rd intergovernmental meeting on the IPBES consultation we provide firstly, a brief history of the IPBES process so far; secondly, a description of the niche that IPBES would occupy in the complex science-policy landscape for biodiversity; and thirdly, conclude with some views on the role of scientists in this future panel, and on the special responsibility of international organisations like DIVERSITAS and ICSU (the International Council for Science) in ensuring that the highest quality scientific inputs for future IPBES assessments are provided.

The IPBES consultation process: a short history

IPBES has been the object of a formal consultation under the auspices of UNEP (United Nations Environment Programme) over the past two years. But the idea of an IPBES has a longer history, and should be understood in this broader context.

There have been efforts to bring an independent science assessment into the Convention on Biological Diversity (CBD) process but for one reason or another these have

2 Terrestrial systems

failed, principally because of concerns about a loss of national sovereignty in controlling the approaches to biodiversity conservation [4^{*}]. A vivid example was the rejection of an attempt by UNEP to provide an international, science-driven assessment of biodiversity (the Global Biodiversity Assessment), which was launched in 1993 and completed in 1995 by a team of more than 1500 international scientists [5]. As the work proceeded and was discussed at a CBD-SBSTTA (Subsidiary Body on Scientific, Technical and Technological Advice) meeting, one of the leading national delegates proclaimed to the effect that, 'we didn't ask for it, we don't want it, and if it is produced we won't use it!' Thus this important document was not legitimate in policy terms—it was not requested by the policy-making process. This development illustrated the importance of having governments associated to the assessment process, and giving mandates to scientists, in order for the scientific work to be legitimate to the policy community.

A subsequent effort to work within CBD-SBSTTA occurred in November 1999 and was led by Peter Schei of Norway, a former Chair of CBD-SBSTTA (1996–1997). This brainstorming meeting on scientific assessments, held in Oslo, Norway, focused on an IPCC-like assessment structure [6]. However, such an assessment process was not subsequently adopted, apparently because of the fear of SBSTTA losing control of the issues.

The Millennium Ecosystem Assessment

At the time of the Oslo meeting (1999) there were efforts outside of the CBD to promote a better assessment process for biodiversity, always with reference to the successful IPCC process. A number of events and discussions crystallized a new approach to assessments, one that would be integrated and that would serve not only the CBD but also biodiversity issues embedded in the other biodiversity-related conventions such as desertification (CCD), wetlands (Ramsar), forest issues as well as climate (UNFCCC). The specific proposal for a Millennium Ecosystem Assessment (MA) arose at the World Resources Institute (WRI) in 1998, led by Walt Reid. The WRI then carried out a proof of concept of this proposal as well as setting up an exploratory steering committee to test the MA concept. In October 1999 the exploratory committee called for the creation of an MA on behalf of four UN Agencies, ICSU, CGIAR (Consultative Group on International Agricultural Research), World Bank, WRI, the World Business Council for Sustainable Development (WBCSD), and the International Union for Conservation of Nature (IUCN). This multi-stakeholder configuration was quite different from previous environmental assessments. With time, the CBD, the CCD, and the CMS (Convention on Migratory Species) accepted that the MA could meet some of their assessment needs, as did the Wetlands Convention (Ramsar). However, the

assessment was not specifically endorsed, or financially supported by an intergovernmental process, in a comparable manner as the IPCC.

The MA brought an innovation to biological diversity assessments. It engaged natural and social sciences and it focused not only on the status of biodiversity elements but also on their products and functions, specifically ecosystem services, or benefits received by society thanks to the functioning of ecosystems. This concept received wide acceptance and has been incorporated into activities and policies at local to international levels and become embedded in research and management programs at all these various levels. The results of the assessment itself garnered considerable attention since it concluded that more than 60% of the services provided by ecosystems have been degraded, mostly during the past 50 years [3^{**}].

The MA was a one-off process but it became apparent at the conclusion that there was a lot left undone and that there should be a follow-up process to consolidate and update the concept and findings. There was also a sense when some of the loose ends were completed that there might be a second MA. The beginnings of a new consolidation process were forged at the final meeting of the MA working groups in Kuala Lumpur in September 2004. ICSU, the UN University (UNU) and UNESCO joined to carry out some crucial follow-up activities. ICSU formed a group to examine what new science was needed if a new assessment was to take place. A report from this group was published in 2009, called 'Ecosystem Change and Human Well-being' [7] as well as a paper in the Proceedings of the National Academy of Sciences [8^{*}] setting out a new research agenda. A program was initiated called PECS (Program on Ecosystem Change and Society) to carry out some of the research agenda outlined in the above documents. The UNU took on the task of providing a distributed secretariat for the coordination of the existing and new subglobal assessments under the MA Follow-up Global Strategy while UNESCO considered how to move their Man and the Biosphere sites into a MA assessment mode.

At the conclusion of the MA, there were two major reviews of the success of the program, one by GEF (Global Environment Facility), one of the financial supporters of the program, and a second by the UK House of Commons Environmental Audit Committee. A meeting organised by UNEP under the leadership of A Duraiappah and I Thiaw was convened in Stockholm in October 2007 to design and implement the MA Follow-up Global Strategy and subsequently a secretariat was established at UNEP to provide support for these activities.

The IMoSEB consultation

In parallel to these efforts, in January 2005, the government of France held at UNESCO a major conference,

entitled 'Biodiversity: Science and Governance' as a follow-up to a commitment made by France at the G8 summit in June 2003 to hold such a conference.

In the opening segment of this conference, which attracted an international audience of more than 1000 participants representing governments, intergovernmental organisations and non-governmental organisations, as well as academia and the private sector, the French President, J Chirac, noted that the work of IPCC had allowed the international community to reach a consensus on the reality of global warming, and that what was needed was a similar mechanism for biodiversity. He called for an 'intergovernmental panel on biodiversity'.

This conference produced two documents, the 'Paris Declaration on Biodiversity', and a Conference Statement [9].

The Paris Declaration, issued by scientists in attendance in Paris, under the leadership of Michel Loreau, President of the Conference International Scientific Committee, and, then, Chair of the Scientific Committee of DIVERSITAS, called 'for the establishment of an international mechanism that includes intergovernmental and non-governmental elements, and that builds on existing initiatives and institutions, with a view to:

- providing scientifically validated information on the status, trends, and services of biodiversity;
- identifying priorities and recommendations for biodiversity protection;
- informing the relevant international conventions, especially the Convention of Biological Diversity.'

The Conference Statement recalled governments' commitments to the 2010 target to reduce the rate of loss of biodiversity and supported the launch of an international multi-stakeholder consultative process to assess scientific information and policy options for decision making.

To follow up on the Paris meeting, a consultation, largely supported by the French government (D Hoffschir, D Babin), was launched on what became known as an International Mechanism of Scientific Expertise on Biodiversity (IMoSEB), and took place between January 2006 and November 2007, guided by a multi-stakeholder International Steering Committee, chaired by Michel Loreau. The consultation was initiated by a series of case studies used to document needs and to propose options, which were then discussed at a series of regional consultations, involving hundreds of stakeholders on all continents (N-America, S-America, Europe, Africa, S-Africa, Oceania, and Asia). The IMoSEB consultation ended with a final International Steering Committee (Montpellier, November 2007), inviting the Executive Director of UNEP to convene an intergovernmental

meeting with relevant governmental, and non-governmental organisations, to consider establishing an efficient international science-policy interface, which would be intergovernmental but also include non-governmental stakeholders and build upon the Millennium Ecosystem Assessment. This Montpellier recommendation represented a crucial step since it made this informal IMoSEB consultation move into the formal framework of UNEP, in which IPBES is currently being negotiated.

IMoSEB consultation and MA follow-up come together: IPBES

In April 2008 (Paris, France), representatives of the IMoSEB consultation, and of the Global Strategy for the follow-up to the Millennium Ecosystem Assessment met and decided to merge their two initiatives, with a view to support discussions on an 'Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services', IPBES. Shortly afterwards, they held a side event at CBD COP 9 (Conference of the Parties, May 2008, Bonn, Germany) to present a joint concept note on the goals and modalities for IPBES.

CBD Decision IX/15 of the ninth meeting of the parties of CBD (Bonn, May 2008) took note of the outcomes of the IMoSEB consultation [10], and welcomed the organisation by the Executive Director of UNEP of a meeting to consider establishing an efficient international policy interface on biodiversity and ecosystem services for human well-being. COP 9 further requested that a set of recommendations on IPBES be submitted for consideration by delegates at CBD COP 10. Having IPBES considered by a CBD decision, with a recommendation to report at CBD COP 10, represented an important political development for IPBES.

In response to the Montpellier decision, and in line with CBD COP 9 Decision IX/15, UNEP organised a first ad hoc intergovernmental and multi-stakeholder meeting (Putrajaya, Malaysia, November 2008), to discuss the need for a new mechanism to strengthen the science-policy interface on biodiversity and ecosystem services. Following Decision 25/10 of the UNEP Governing Council, a second intergovernmental and multi-stakeholder meeting took place in Nairobi, Kenya, in October 2009. The Nairobi meeting was attended by 225 delegates representing 95 countries and numerous organisations, thus demonstrating the interest that IPBES has generated in the science-policy community. Representatives at that meeting were presented with a gap analysis of needs for an IPBES requested by the Putrajaya meeting, and prepared by UNEP. This gap analysis highlighted five main needs, namely for improvement in the scientific independence of the science-policy interface, for strengthening collaboration and coordination in generating a shared knowledge-base, for regular and timely assessments, for policy implementation support, and for

4 Terrestrial systems

capacity building. Representatives recognised in the Chair's summary, that, based on this gap analysis of needs, there was currently no existing intergovernmental mechanism meeting all of these identified needs, and that a new mechanism needed to be considered, in addition to strengthening what already existed.

Some of the key issues that need to be finalised at the third meeting of the IPBES consultation include:

- whether or not to establish IPBES.
- the governance and key operating principles of IPBES, which in our views, should ensure that IPBES is scientifically independent, and credible, and thus separate from, but responsive to the needs of all biodiversity-related multilateral environmental agreements and UN bodies; that IPBES is multi-stakeholder, and not strictly intergovernmental, and thus also serves the needs of UN organisations, the scientific community and other stakeholders, such as relevant NGOs, the private sector and civil society organisations;
- and the specific functions of the proposed IPBES, which might include firstly, catalysing knowledge generation; secondly, assessing knowledge (global, subglobal and thematic assessments); thirdly, supporting policy formulation and implementation; and fourthly, building capacity.

Where will IPBES fit in the biodiversity science-policy landscape?

The nature of an assessment effort like IPBES, and the niche it will fill in the science-policy landscape, are complex. We explain below how the biodiversity science-policy community is currently building a set of key observation and assessment tools, and how the various pieces will fit together.

In order to be successful, the science-policy interface for biodiversity and ecosystem services at the international level needs four components each complementing one another: firstly, research; secondly, observations; thirdly, assessment; and fourthly, policy. Without these four components fully in place, the interface, that is the delivery of policy relevant information based on sound science and appropriate observations, will not function optimally.

To illustrate this point, it is worth drawing an analogy with the international science-policy interface for climate, which already has these four components in place, working in a complementary manner:

- (1) For the research component, the World Climate Research Programme, WCRP, and the International Geosphere Biosphere Programme, IGBP, coordinate scientific research at the international level, and

generate scientific knowledge on climate change, on which regular IPCC assessments are based.

- (2) For the observation component, the climate observing systems (e.g. the Global Climate Observing System, GCOS; the Global Ocean Observing System, GOOS) organise the long-term operational collection of climate relevant data at multiple scales.
- (3) The assessment component, the IPCC, assesses the scientific information relevant for understanding the risks associated to human-induced climate change.
- (4) The policy component is the United Nations Framework Convention on Climate Change, UNFCCC.

It may be worth mentioning here that IPCC, like any other assessments (e.g. MA, IAASTD, the International Assessment of Agricultural Knowledge, Science and Technology for Development), 'does not conduct any research nor does it monitor climate related data or parameters'. IPCC produces peer reviewed scientific reports, based on published scientific literature, which represent state of the art consensus knowledge on the risk of climate change caused by human activity.

When it comes to the field of biodiversity and ecosystem services, at the international level:

- (1) The research component is in place but needs strengthening.
- (2) The observation component is currently being developed.
- (3) The assessment component is still missing, and is under discussion: this would be IPBES.
- (4) The main policy components are the Convention on Biological Diversity (CBD) and other biodiversity and ecosystem services related conventions.

With respect to the research component, at the international level DIVERSITAS, under the auspices of ICSU and UNESCO, catalyses the production of integrated scientific knowledge on biodiversity. Its mission is to provide the scientific bases for the conservation and sustainable use of biodiversity. DIVERSITAS does so by implementing a number of core projects that involve a network of national committees, as well as scientists from all countries and relevant disciplines, who build and add value to national initiatives. Other international scientific programmes (e.g. Earth System Science Partnership, ESSP; see [11^{*}]; International Human Dimensions Programme on global environmental change, IHDP) will also contribute to this research component, in a way that is further developed in the next section.

As far as observations are concerned, a new global partnership, called GEO BON (the GEO Biodiversity Observation Network), is currently being designed as part of the intergovernmental process called GEOSS, the Global

Earth Observing System of Systems [12]. When fully implemented, GEO BON will help collect, manage, analyse and report data relating to the status of the world's biodiversity, building on a complex network of biodiversity monitoring projects, and provide users (mostly nations), with the data, observations, and products they need at the national, regional, and global level to follow changes in biodiversity and ecosystem services. GEO BON will aggregate information from local to global and deliver information to policy makers on biodiversity indicators, ecosystem services, conservation planning, to take a few examples.

For the future IPBES to be successful, it will therefore be important that the international research initiatives mentioned above, as well as other relevant ones, be further developed and strengthened; and that the observing component, GEO BON, be established, and implemented. At the same time, national capacity to engage in biodiversity research and assessment is crucial since future assessments are most likely to be bottom up — local to national to global.

What are the roles of scientists in IPBES?

Scientists will, of course, play a major role directly in IPBES, since they will be directly called upon by governments, and possibly other stakeholders, to draft various parts of the reports, as they have been doing for the MA or other similar assessment exercises. This section does not discuss this direct involvement in IPBES, but rather the other roles that scientists will need to play to ensure that IPBES be effective as a science-policy mechanism and that the science necessary for future IPBES assessments is indeed produced.

The main domain where scientists will be active is that of knowledge generation, which will be performed outside of, but in close connection with IPBES. Since assessments are based on published scientific literature, it is important to ensure that we, the scientific community, have the right mechanisms in place to produce the science relevant for future assessments.

We believe that IPBES can play an important role in catalysing collaboration, strengthening existing scientific mechanisms, and making science more relevant by identifying priorities, which would focus the efforts of the scientific community, at the international level, in particular. IPBES would represent a platform where scientists can dialog with policy makers and other stakeholders on policy and scientific needs.

IPCC has played such a role within the climate community, in organising a dialog between governments and scientists, and in focusing and structuring the international research efforts around a set of common products. Spurred on by international programmes (e.g.

WCRP), scientists have developed more than 20 internationally recognized climate models, which have been run using a common set of socio-economic scenarios, making it possible to perform intermodel comparisons and undertake rigorous analyses of uncertainty in climate change projections [13].

There are a number of scientific challenges which the biodiversity and ecosystem services community will have to address to feed into future IPBES assessments. Just one of many such challenges relates to models and scenarios. The last decade has seen the development of quantitative projections of the impacts of 21st century global change on biodiversity (MA; GEO4, the Global Environment Outlook 4 of UNEP; GBO-3, the Global Biodiversity Outlook 3 of the CBD), which represent a major step forward for biodiversity assessment. However, rigorous evaluation of uncertainty in model projections has been lacking. Much more scientific work needs to be done in this area if we want to improve projections of global change impacts on biodiversity and ecosystem services. In particular, a much broader range of models of global change impacts on biodiversity is needed, models need to be validated with observational data and experiments, and a broader range of socio-economic scenarios need to be developed. International efforts have been initiated to improve scenarios and models in collaboration between DIVERSITAS and other ICSU programmes such as IGBP, but much more needs to be done.

In addition to catalysing the generation of knowledge, IPBES would also be expected to catalyse the establishment of the observation component of biodiversity and ecosystem services, namely GEO BON, accelerate efforts to collect and share data, and make data collection more policy relevant.

Conclusion

Recently, three international organisations representing either scientists (DIVERSITAS and ICSU), or other stakeholders and, in particular, non-governmental organisations (IUCN) carried out together an on-line consultation of their respective constituency on IPBES, to feed into debates at the 2nd ad hoc intergovernmental and multi-stakeholder meetings (Nairobi, October 2009; results were presented at that meeting). The survey was sent to thousands of scientists and 700 NGOs, and a summary of this IPBES consultation is available on-line.

When asked what were the obstacles for a better use of scientific knowledge in decision making, decision makers mentioned a difficulty to access scientific results, issues with independence and quality of science, and a general lack of relevance of existing data for policy work. Scientists, on the other hand, expressed a desire for their work

6 Terrestrial systems

Box 1 Statement adopted at the DIVERSITAS second Open Science Conference (Cape Town, S-Africa, October 2009)

The 700 scientists and policy makers who attended the DIVERSITAS 2nd Open Science Conference, entitled 'Biodiversity and society: Understanding connections, adapting to change', in Cape Town 14–16 October 2009, adopted the following conference statement:

As we approach the 2010 Year of Biodiversity, the DIVERSITAS second Open Science Conference confirms that the fabric out of which the Earth system is woven is unravelling at an accelerating rate. At the same time, we are discovering ever more about biodiversity and the benefits it provides to people. It is clear that biodiversity loss erodes the integrity of ecosystems and their capacity to adapt in a changing world. It represents a serious risk to human well-being and a squandering of current assets and future opportunities.

The biodiversity scientists gathered here commit themselves to finding practical solutions to this problem. They will do so by: increasing shared knowledge of biodiversity and its functions; helping to develop systems for monitoring the biodiversity of the planet; and being responsive to the knowledge needs of society with clear communication of findings.

The proposed mechanism for the ongoing evaluation and communication of scientific evidence on these issues is an Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). We call on governments and non-governmental organisations to join us in establishing IPBES as soon as possible. We urge policy makers to act swiftly and effectively on the already-established and future findings relating to ways of limiting further biodiversity loss and restoring ecosystem services.

Meeting current and future human needs must make adequate provision for the complex web of life of which people are an integral part. People everywhere must give effect to their shared desire for a biologically rich and productive planet through their individual decisions and political voices.

to be more relevant, but admitted a lack of awareness about policy needs and processes.

This lack of awareness about policy mechanisms among the scientific community must be addressed. We strongly believe, thus echoing Mooney and Mace [2**], as well as the conclusions of the 700 scientists who recently met at the DIVERSITAS Open Science Conference (Cape Town, S-Africa, October 2009; OSC2 Conference statement; see Box 1) that time has come for scientists to educate themselves about policy work in order to become 'responsive to the knowledge needs of society'. Scientists can no longer hope that their work will somehow be used by policy makers. They should try to understand how policy works at local, national or international levels, dialog with users of information to develop together an understanding of knowledge needs, and try to adapt and focus their work to these needs.

IPBES, if successful, will go a long way in increasing this awareness among scientists and organise this dialog, but efforts need to start now and to happen quickly at all scales where information is needed, in order to improve science-based decision making. These are crucial times

for our biodiversity and ecosystem services scientific community. Scientists need to become much more involved in understanding and promoting the crucial and continuing dialog that is needed between themselves and decision makers.

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References and recommended reading

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- of special interest
- of outstanding interest

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