The European Platform for Biodiversity Research Strategy: promoting knowledge for sustainability

Concept note:
Network of knowledge for biodiversity governance

Biodiversity is not just "the natural world" or "things in nature reserves." It is the intricate, complex, interacting and dynamic world of life on Earth, including humans and the ecosystems that we and other living things depend upon. It underpins every human culture and every economy.

This discussion paper was prepared at the initiative of EPBRS.

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Executive summary

Policy and decisions that affect the conservation and sustainable use of biodiversity should be based on the best available evidence. Global and regional discussions have shown that much of the available science and experience is not being effectively used, and that interfaces between science and policy must be significantly improved.

A network of knowledge, bringing together existing organizations and processes in a flexible, responsive and broad-based way, would improve the science-policy interface by helping to focus the support of science and scientists on the needs of those setting policy and taking decisions. The network of knowledge would allow temporary, *ad hoc* associations of diverse organisations to assemble and communicate knowledge adapted to the needs of clients. The use of existing organisations minimises administrative costs and overheads.

The main tasks of the network of knowledge would be to respond to the needs of decision-makers by: answering requests for information with policy-relevant information, policy options and scenarios; providing early warnings; co-ordinating multiple-scale assessments; helping to build capacity; and communicating with stakeholders, and where appropriate, the public.

The concept of a network of knowledge is scalable and relevant to improvement of science-policy interfaces at all levels from global to local.

At the hub of the network is a body that reviews the knowledge provided by the "knowledge holders" and produces reports that are: authoritative and supported by evidence, useful and timely, and relevant to the user's needs; reviewed by qualified experts to ensure that the report is thorough and widely accepted by knowledgeable persons; independent of any vested interests or political, commercial or financial influence; and informative about uncertainties and the limits of applicability of the knowledge. The reports preserve the intellectual property rights of knowledge holders.

The governance structures related to the network of knowledge need the capacity to: co-ordinate questions and scientific knowledge; keep the system in good administrative order; orient the work and manage the finances; manage drafting panels, outcomes and reviews; and communicate the findings.

The cost of an international network of knowledge and the associated governance structures for a biodiversity interface is likely to be similar to the cost of the IPCC.

Background and purpose of document

Two science-policy interfaces on biodiversity and ecosystem services are currently under discussion: an Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and, on the European scale, the establishment of an "EU mechanism for independent, authoritative research based advice"[1] . They are both intended to encourage communication, consultation and cooperation between scientists and policy makers, and thereby contribute to efforts to manage equitably the relation between humans and the ecosystems on which we, and life on Earth, depend. Although these are separate developments, with their own histories, stakeholders, characteristics, requirements and architecture, each interface would necessarily link scientific and policy elements.

The Chair´s report of the meeting on an IPBES (Putrajaya, November 2008)[2] makes it clear that the participants saw a need to strengthen the science-policy interface and to provide more effective means to support multiple-scale assessments, compile, assess and synthesise existing scientific knowledge to provide early warning and policy-relevant information on biodiversity and ecosystem services and to contribute to building capacity[3]. This document provides a view of a possible mechanism to provide those services.

It focuses on how to gather relevant information and to ensure that it is made accessible and useful to the policy makers and other stakeholders who need it. The functions it describes do not comprise a complete IPBES since it only touches lightly on the client, or policy, side of the interface.

The Chair's report makes reference to a "network of networks" to access and supply information. In line with the draft EU position for the UNEP Governing Council meeting in May 2009, this document uses instead the term "network of knowledge"[4] to describe a system that improves access to reliable and timely information.

This concept note provides a general description of the characteristics and advantages of a network of knowledge for biodiversity, including potential elements and structure of its governance model. It discusses a cost-effective way to build on existing structures and networks, to gather existing knowledge, derive policy-relevant information, and to deliver the peer-reviewed result to the science-policy interface. It is intended to provide a consistent way

[1] See Communication from the Commission COM (2006) 216final, Halting the loss of biodiversity by 2010 – and beyond, Objective 10, Activity A.10.1.1

[2] In annex to UNEP/IPBES/1/6 available at http://ipbes.net/Documents/Advance_IPBES_Meeting_Report.pdf

[3] This note interprets "Assessments" as formal, demand-driven processes to develop comprehensive statements of status, trends and drivers of change in biodiversity and ecosystem services.
"Early warning" relates to developments, trends or discoveries that the network considers should be brought to the attention of policy makers before any client has asked for information on that issue.
"Policy-relevant information" is taken to include information delivered in appropriate formats for policy-makers and practitioners on any issue related to biodiversity or ecosystem services.
Some typical questions that might be put to the network are listed in Annex 1: Examples of questions for a network of knowledge.
"Capacity building" consists of activities intended to improve the scientific, analytic and networking capabilities of institutions and individuals.

[4] The term "network of knowledge" is preferred to the alternative "network of networks" because it focuses on what the network is intended to deliver and exchange (knowledge) rather than what the network might consist of (other networks). Furthermore, the term "network of networks" seems to imply that organisations that are not networks cannot be part of the system. By saying nothing about the architecture of the knowledge providers, "network of knowledge," is both more inclusive and more accurate.

to interrogate a complex landscape of knowledge, and to do so in a way that permits correct attribution of knowledge to those who provide it.

The objectives of the Concept Note are:

1) To present a perspective that complements other ongoing processes in recognizing the need for an improved science-policy for biodiversity;

2) To introduce and argue for a "Network of Knowledge" (NoK) that builds on given structures or networks;

3) To define the functions and tasks of a NoK and to suggest a possible governance model to make it operational.

This concept note was developed by an expert group of the EPBRS, which developed a first draft in early 2009. This draft was used as basis for discussions at the EPBRS workshop on a Network of Knowledge for Biodiversity held in Brussels on the 6th of May 2009[5]. The results of this meeting of more than 100 experts from Europe and beyond was used by EPBRS in revising this concept note, but it is not to be understood as a consensus from the participants of the workshop.

Main principles for a Network of Knowledge

From the discussion in Putrajaya, and from earlier consultations in the IMOSEB process, it emerges that the main tasks of a network of knowledge would be to:

- respond to requests for information from its clients, including, if required by its clients, policy-relevant information, policy options and scenarios;
- provide reports on issues that its members wish to draw to the attention of its clients, including both early warnings and in some cases the need for further research on key policy-relevant issues;
- design and co-ordinate multiple-scale assessments that respond to the needs of decision-makers;
- help to build capacity to provide reliable, evidence-based and policy-relevant information and to undertake assessments;
- interpret its findings for the clients of the network, and communicate with them, with other scientists, and where appropriate, with the public, concerning the implications of their findings, and what policy options might be available.

Thus the network can respond to requests for information from policy makers (it can be demand-driven). It also allows knowledge providers to identify issues that may trigger its coordinating body to initiate investigations and to bring the findings of such investigations to the attention of policy makers (it can be proactive).

Examples of the kinds of questions that might be asked of a network of knowledge, or generated spontaneously from within, are given in Annex 1.

[5] For details and report of the workshop, visit http://www.epbrs.org

The main potential clients of the network of knowledge are public or private decision-makers. Their decisions affect international and in some cases, regional or national biodiversity governance. They may include the global and regional conventions and agreements related to biological diversity, governments and administrations, Civil Society Organisations and businesses. They may also include other organisations with a responsibility for biodiversity governance, management, research and capacity building.

Biodiversity research necessarily touches on a wide range of issues and disciplines, and is intrinsically interdisciplinary.

The knowledge provided to policy makers should, as far as possible, be:

- in formats relevant to their need;
- delivered to appropriate fora on appropriate dates ;
- authoritative and supported by evidence, useful and timely, and relevant to the user's needs;
- in almost all cases, a product of peer-reviewed inquiry;
- independent of any vested interests or political, commercial or financial influence;
- when appropriate, include information about uncertainties and the limits of applicability of knowledge.

The network would ensure proper attribution and preserve the property rights of knowledge holders.

Improving the science-policy interface

A range of issues prevent or impede the flow of information between science and policy in the biodiversity area[6].

Foremost among the scientific issues is the need for more observational data and access to fundamental information on the natural world (including non-professional knowledge), with adequate quality and at appropriate scales. Scientific training should be more inter-disciplinary, while better integration and coordination would improve the generation and exchange of knowledge, analysis of data, and modelling. .

Greater transparency and the anticipatory and proactive involvement of a wide range of scientific experts would improve the decision-making processes. The mismatch in the phasing and timing of science and policy cycles is more difficult to overcome. Greater public understanding of the importance of biodiversity issues leading to social pressure on policy would serve to raise the profile of biodiversity in political agendas.

Many issues raised by the participants of the Brussels workshop concerned shortcomings in current science policy interfaces. These include inadequate funding for relevant research, conflicts of interest, and lack of incentives for scientists to work on policy questions. The flow of information between science and policy is impeded by the difficulty scientists find in

[6] see for instance
UNEP-WCMC, 2009: Gap analysis for the purpose of facilitating the discussions on how to improve and strengthen the science-policy interface on biodiversity and ecosystem services: http://ipbes.net/Documents/IPBES_2_1_INF_1.pdf
van den Hove, S., Chabason, L. 2009, The debate on an Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). IDDRI Discussion Papers N° 01/2009 Governance.

communicating complex ideas simply and in focusing on the central messages rather than on the uncertainty of research results. Conversely, policy questions are not formulated and explained clearly enough to scientists. Importantly, the workshop pointed out that scientists are discouraged from participating in political processes when their advice is not followed up by actions.

Based on these impediments, some key functions of effective mechanism can be identified. Importantly, the mechanism should

- foster the provision of open-access databases from all relevant sources, including non-scientific and interdisciplinary knowledge,
- facilitate collaboration between researchers, organizations, and disciplines,
- help create incentives for scientists to engage in policy-relevant research,
- improve two-way communication between scientists and policy-makers,
- promote public support and awareness for biodiversity,
- foster transparency, independence, and credibility of decision making processes,
- ensure unbiased selection of competent scientific experts for policy support, and
- promote pro-active participation of scientists in policy decision making.

Many of the key functions identified lie outside the capacity of the scientific community to remedy by itself. The only exceptions are issues of access to data, increased coordination and greater integration between disciplines. The difficult issues – including for example incentives for scientists to contribute to the provision of knowledge to policy, or the reluctance of high-impact scientific journals to publish trans-disciplinary papers – remain in the hands of others, although they are among the most critical for any science-policy interface.

A possible governance model of a Network of knowledge

The scheme in Figure 1 below attempts to synthesize the results of the Brussels workshop discussions on possible governance models. It is not however a direct result of the workshop. The synthesis relies on several main elements, which are described as follows:

- **Knowledge providers** include research institutes and individual scientists as well as networks, IPs, learned bodies, CSOs etc.
- **Knowledge hubs** are points of contact by theme, region, country or whatever is appropriate for the smooth function of the network in that particular field.
- **Working groups** are assembled to write report on specific issue, and dissolved afterwards.
- **A knowledge coordinating body** establishes ad hoc working group by asking for nominations from knowledge hubs. It also handles editing and peer review of reports.
- **An executive body** handles major admin and strategic issues, including finance.
- **A secretariat** handles budget and co-ordinates activities of all other bodies. It also handles publication and dissemination of reports.
- **A government validation body** is set up for specific issues only, and only looks at wording and presentation of summary reports (not substantive issues, and not the main reports).
- A **plenary** is the chief governance structure and is not directly part of the NoK.

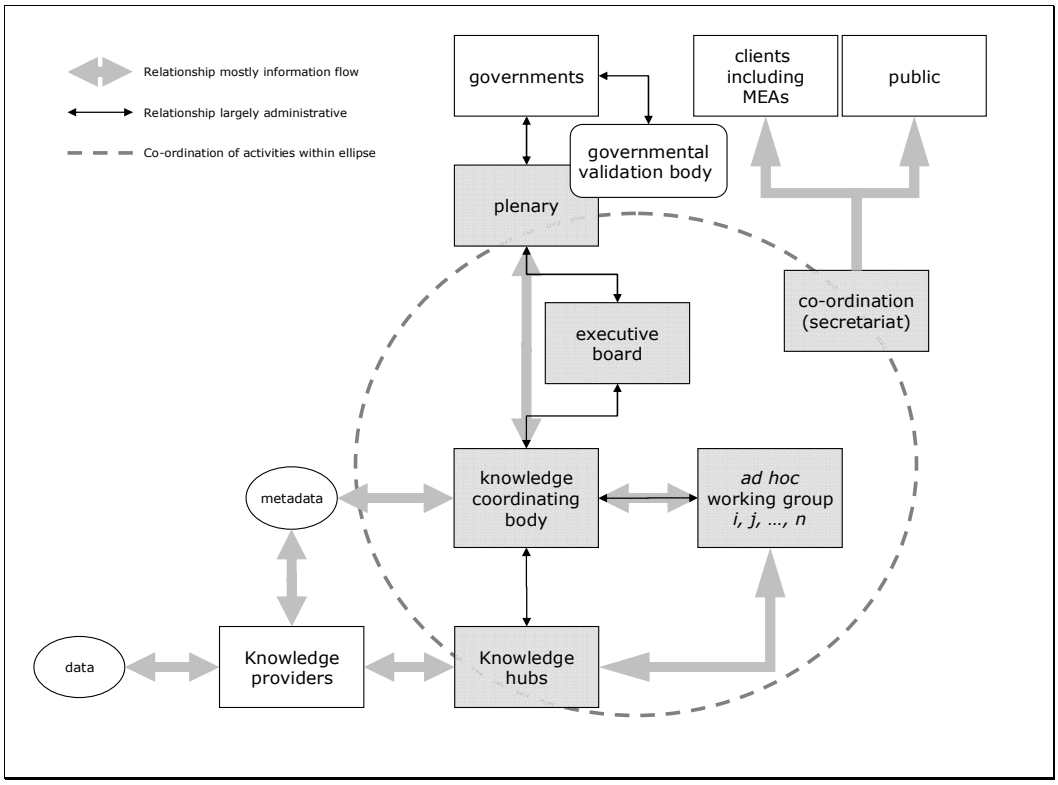

Figure 1. A proposed synthesis for a governance model

Functions in detail

The workshop discussions helped to identify possible functions of the NoK. In the following list, these functions are allocated to the structural units shown in the figure. Their sequence in the list does not reflect priority or importance.

Executive board:

- decide which questions are to be answered by the network
- establish policy and strategic orientation of the network of knowledge
- determine objectives, scope and general work plan of the network
- select the director of the secretariat
- review the performance of the secretariat
- periodically review the system and assess its impact
- assess whether the mechanism represents an effective use of resources
- consider partnership with other organizations and institutions
- approve the personnel making up the bodies
- decide on client-side membership
- administrate the network of knowledge

Co-ordination (secretariat)

- design communication plans specific to the issue
- develop strategy for communication

- develop strategy for education
- develop strategy for outreach
- develop strategy for publication
- ensure information flows between clients and knowledge holders
- ensure relevant bodies are informed of mechanism and its output
- handle the day-to-day budget of the system
- liaise with regional, national, local or thematic points of contact
- manage overall finance of the system
- organise government validation of summary reports (like IPCC)
- publish reports
- schedule and co-ordinate the work

Knowledge coordinating body

- communicate the question to the providers
- control the flow of questions to the network of knowledge
- convene working groups or other meetings
- identify and keep track of appropriate knowledge providers
- identify specialised knowledge holders when necessary
- maintain dialogue across levels and between providers
- negotiate the wording of the summary reports
- organise peer review
- prepare initial draft summary reports when the client requests them
- prepare peer reviewed, revised report adapted for client

Ad hoc working groups:

- refine, construct, and define the question
- co-ordinate scientific and editing tasks
- generate output (reports that respond to requests)
- discuss and set out recommendations, policy options as appropriate
- signal the need for research, assessment or capacity building

Knowledge hubs (existing institutions like DIVERSITAS, IUCN, Integrated Research Projects, learned societies etc. Countries may establish national knowledge hubs)

- gather evidence and data using well-defined, usually scientific, methods and processes.
- access and provide knowledge and expertise
- coordinate specialized activities
- help identify appropriate experts

Quality assurance and peer review

The aim is to provide reliable knowledge that is fit for purpose. This frequently means that it should be of high scientific quality. Not all organisations and networks will provide equally reliable information. Thus the assessment of the quality of knowledge is a key issue, and the

key to the long-term utility of the network of knowledge depends on an adequate quality assurance.

Peer review, the conventional and reliable method to evaluate the quality of academic knowledge, can be used for those organisations and networks that generate academic knowledge.

Network of knowledge at various scales

The concepts and principles of the network of knowledge are largely the same for the provision of knowledge to clients at a global, regional, or in some circumstances, national scale. A network of knowledge can be constructed out of networks that operate at more local scales. Nested within the global scale network of knowledge may be regional networks, and nested in them, national and local ones.

The remit and clients of the network are clearly sensitive to scale.

Complementarity and added value with existing institutions

By reducing the potential for replication of work, focusing effort and attention on key issues, and fully exploiting the existing knowledge base, a NoK would make efficient and effective use of resources and facilities, such as GBIF, while increasing the relevance, effectiveness and profile of those facilities.[7]

By drawing on existing data sources and expertise, it would increase our capacity to answer questions rapidly and to identify and respond to emerging issues. In this it would contribute directly to, and benefit from, the Global Earth Observation System of Systems (GEOSS).

Cost and financing

Unless funds are available to support scientists and organizations in making input, then the input depends not on the best science but on those scientists who are able to contribute using someone else's money or at their own expense. This would inevitably preclude many scientists and organisations from contributing, and bias at source the knowledge contained in the reports. Funding must therefore be found not only for the network functional bodies (secretariat etc.) but also for the workshops, and for work done in gathering the information and preparing the contributing chapters.

For the sake of comparison, the IPCC's Trust Fund budgeted around €3.8m (5.6m Swiss francs) for 2008, with IPCC governing bodies allocated about a third of the budget, and scoping meetings, expert meetings and workshops absorbing one fifth. Roughly one half of the budget was dedicated to other expenditures. 2008 was a year of relatively low activity for the IPCC. When the main IPCC reports are prepared, negotiated and published, the budget is of the order of twice this amount.

Many IPCC activities are not financed by the Trust Fund, but through voluntary contributions from governments (in particular Japan, the Netherlands, the United Kingdom and the United States of America). India provides support for the website, while WMO and UNEP provide staff and financial support. Thus the true cost of the IPCC is considerably larger than the numbers quoted here.

[7] On a European scale, it would complement and add value to the future large infrastructure networks.

The cost of the network of knowledge and the associated governance structures for a biodiversity interface can be expected to be similar, and given the complexity and range of issues covered by biodiversity, probably rather more than the cost of the IPCC.

Some components of the network may be able to use existing sources to finance their participation. This might involve adapting existing funding frameworks within the community of participating organisations, which may already include multidisciplinary and international collaboration.

For an operational system some additional funding will certainly be necessary. In an international network of knowledge, the nested nature of the network suggests that national networks would receive national finance. Clients will presumably contribute to the governance structure, including the secretariat, advisory and other governance bodies.

Conclusions

A "network of knowledge" on biodiversity and ecosystem services can be seen as a coordinated, flexible, dynamic and purpose-specific grouping of organisations that collaborates to provide and communicate knowledge[8] about biodiversity and ecosystem services. It should be an *ad hoc* grouping of specialised sources of knowledge, and not a permanent association of networks or institutions. Its coordinating body brings together each temporary group specifically to answer a particular question. The network normally grounds its work on existing knowledge about biodiversity and ecosystems. It provides a way to find and assemble the requested information from the "knowledge holders" (institutions whose members are expert on fields related to biodiversity and ecosystem services), while offering opportunities to build capacity and to compare information from various sources.

By using and building on what exists, and assembling appropriate knowledge from temporary, *ad hoc* associations of organisations, adapted to the issue under review, the network of knowledge provides access to relevant knowledge without un-necessary administrative or cost overhead.

It can readily respond at scales from the global to the local depending on its remit and its membership. Properly selected, a network of knowledge provides an ideal partnership for assessments, including a follow up of the Millennium Ecosystem Assessment.

By accessing a range of different kinds of knowledge, the network can deliver or help create options for policy or management that take into consideration all relevant social, economic and biological constraints and knowledge, providing a rounded, complete and inter-disciplinary understanding of the issue.

The network of knowledge provides a channel through which clients can pose questions and request assessments, and an environment in which knowledge providers can work with one another to derive integrated answers from existing knowledge, or construct analyses of emerging issues, synthesise the results of assessments, and formulate and disseminate reports for easy use by the clients.

[8] "Knowledge" is defined in this note as perceptions, discoveries, or lessons learned through experience or study giving familiarity, awareness, and understanding of biodiversity and ecosystems. In some parts of the English-speaking world the plural "knowledges" might be used instead, to indicate the plurality of sources and means involved in gaining that understanding.

Annex 1: Examples of questions for a network of knowledge

1. What are the distribution, status and trends of species and habitats of various important taxa (e.g. the world's mammals, algae, echinoderms, fungi, beetles, flowering plants etc) and in key functional groups (e.g. pollinators)?
2. As biodiversity changes, what elements of ecosystem services also change?
3. How can practitioners assess what constitutes minimum viable areas, favourable conservation status and effective ecological networks for various species?
4. What are the probable effects on biodiversity of large-scale geo-engineering proposals to mitigate climate change, such as ocean fertilisation with iron?
5. To what extent is biodiversity change likely to promote new and emergent diseases?
6. What aspects of our understanding of public beliefs, perceptions, attitudes and preferences regarding biodiversity should be improved in order to make policies aimed at stopping biodiversity loss more effective?
7. What incentives to conserve biodiversity are offered by existing markets and institutions, how effective are they, and how can they be improved or complemented?
8. To what extent are policies intended to make sustainable the use of biodiversity and ecosystem services implemented, to what extent are they effective, and if they are not, what options are there to generate effective policy?
9. Under what circumstances around the globe are the goods and services provided by ecosystems extracted or used sustainably, and how can we use biological resources, goods and services in a sustainable manner, incorporating where appropriate, lessons learned from traditional knowledge, innovations and practices?
10. What are plausible scenarios for future ecosystem functioning given various intensities of unsustainable use of components of biodiversity, and what would a "sustainable use" scenario look like?