Comment on De Meester and Declerck, 2005 (target review)

Towards a coherent and high-quality science policy on biodiversity

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According to De Meester & Declerck (2005), monitoring and survey programmes are likely to become the preferred scientific tools supporting a policy on biodiversity conservation. Nevertheless, without the input of a science carried out in accordance with the highest quality standards, these tools will not be able to guarantee long-term, effective biodiversity management. Scientific principles must indeed guide a systematic and objective documentation, analysis and assessment of biodiversity as well as trends in the state of population, species, habitats and the ecological services that these species and systems provide. Furthermore, one expects science to establish the causes of the loss of biodiversity, particularly those generated by man, to identify priority solutions and to provide the tools to assess the effectiveness of these solutions.

The question at present is how to develop and implement a science capable of covering all these dimensions, both local and global, and that can thus support the conservation and sustainable use of biological diversity. We believe that this must evenly develop along four lines of action: enriching knowledge, improving analysis, furthering the synthesis and integration of information and developing a new way to carry out research in support to biodiversity conservation.

Four lines of action for a coherent science policy on biodiversity

Enriching knowledge

De Meester & Declerck (2005) identify several issues where knowledge about freshwater biodiversity is lacking. To address these, specific research efforts are required, notably to increase our knowledge on structural and functional aspects of biodiversity and its components, and to explore poorly known habitats and species. Developing expertise across a wide range of disciplines: evolutionary biology, ecology, taxonomy, applied biology, conservation biology including a better use of new technologies such as molecular biology (e.g. DNA taxonomy), bio-informatics or satellite imagery ought to improve the base-line knowledge that is a necessary prerequisite to any conservation policy.

Improving analysis

Reliable tools for scientific analysis must be developed with a view to devising more effective and widespread conservation measures. De Meester & Declerck (2005) highlight the need for new models, experimental research at the appropriate scale, new concepts, harmonised methodological protocols and improved sampling methods. Any analysis also implies clearly identifying the hypotheses on which it is based and defining the limits thereof.

Furthering the synthesis and integration of information

At the same time as collecting new data, it is important to make already existing, but patchy data more readily available and more useful. Identifying priority actions and research shortcomings with regard to the preservation of biodiversity will be possible through structured access to information and data collated from different sources and layers, for different purposes and covering numerous research areas, through managing and maintaining access to the data and

through the analysis and the interpretation of the gathered information.

Developing a new way to carry out research in support to biodiversity conservation

A science in support to biodiversity conservation should better harness the practical application of certain disciplines such as taxonomy.

Cross-disciplinary research networks, carried out jointly by biodiversity researchers, conservation practitioners, economists, lawyers and social scientists provide a means to develop common approaches to biodiversity conservation problems.

As other sciences in support to policy making, a science devoted to biodiversity conservation must absolutely be implemented in such a manner as to further communication and the exchange of expertise between scientists and the potential users of results: nature conservation associations, the authorities concerned from different sectors relevant to conservation, the private sector, the educational sector and citizens.

A research *continuum* underpinned by high-quality scientific and management standards

The devising and implementing of effective measures for biodiversity conservation is based on both short- and long-term studies, carried out on both small and large scale, at a sectoral, cross-sector or integrated level. Every research type and stage helps to assess the progress made towards the target set by the World Summit on Sustainable Development: 'achieving a significant reduction in the current rate of biodiversity loss by 2010'.

Three categories of research characterise this scientific *continuum*:

An academic, basic research carried out over several years in a context of international research, aimed at anticipating needs, particularly political ones and playing a forward-looking, early-warning role as well as clearing up a number of uncertainties,
A strategic, more applied research that creates reliable and appropriate analytical tools to develop, implement and monitor political decisions in order to assess their effectiveness,

The development of an expertise in biodiversity that trains cross-disciplinary scientists who are able of tap into and transform research experience into useful recommendations for decision-makers or of providing answers to political questions in a short time span.
In concurrence with De Meester & Declerck (2005), we believe that this research, whether it is guided by a 'bottom-up' or a 'top-down' approach, should be carried out in accordance with high standards of scientific but also of management quality.

For this three conditions need to be fulfilled:

- The application of rigorous assessment procedures on submitted proposals as a result of a call, by a panel of international experts who have the requisite cross-disciplinary skills. Such procedures based on precise criteria in terms of relevance and scientific, technical methodological and strategic quality can ensure that the proposal takes account of recent research developments, that it is well designed and that it does not repeat what has been done elsewhere. Furthermore, they enable co-operation with foreign research teams. These assessment procedures are already implemented at European (Sixth Framework Programme, European Science Foundation) and national level (e.g. Belgian Scientific Plan for a Sustainable Development policy (SPSD)).
- The creation of appropriate consultation mechanisms between bodies which fund research both at national (e.g. the SPSD guidance committee of the Belgian science policy), and European level (e.g. the ERA-net scheme). These consultation mechanisms aim at promoting research synergies, preventing duplication, making optimal use of budgets, exchanging good practices for research management and encouraging the running of key projects at the appropriate scale.
- The creation of interface structures at all levels of power (e.g. the European Platform for Biodiversity Research Strategy (EPBRS)), the National Biodiversity Platforms: (e.g. http://www.biodiversity.be/bbpf), users committees of research projects (e.g. SPSD of the Belgian Science Policy),... between research departments and sectoral policy departments: environment,

nature conservation, spatial planning, agriculture, fisheries, development cooperation, the economy, etc..., in order to identify research priorities, to assess and promote the transfer, the harnessing and the utilisation of experience gained through research, notably into monitoring and survey programmes.

The exchange of good practices for programme management between bodies funding research, the optimal use of consultation structures at ministerial and administrative level, the increased development of a science policy interface at all levels of power are a guarantee for the development of a high-quality science in support of an effective, long-term management of biological diversity.

Reference

De Meester, L. & S. Declerck, 2005. The study of biodiversity in freshwater habitats: societal relevance and suggestions for priorities in science policy. Hydrobiologia 542: 1–9.