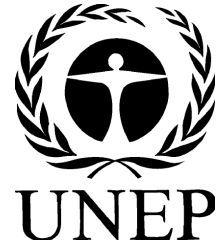




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***PAN-EUROPEAN BIOLOGICAL AND LANDSCAPE DIVERSITY
STRATEGY***

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BACKGROUND PAPER:

Conclusion and outlook

From a report: "Biodiversity, Ecosystem Services and Resilience - Governance for a Future with Global Changes" commissioned by The Swedish Scientific Council on Biological Diversity in 2009

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Conclusions and outlook

Formulating post-2010 biodiversity targets requires recognition of the dynamic interplay between biodiversity, ecosystem services and development in the context of rapid global environmental change. Needless to say, this is a very challenging task. This report has focused on describing the ecological context in which targets can and should be set – as well as the governance context in which targets are steered towards. Moreover, a successful post-2010 goal for halting biodiversity loss requires an agreement that communicates outside the biodiversity community and is understandable and relevant to poverty reduction and human well-being. It is also obvious that coherence between all biodiversity-related policy areas must be secured at global, European, national and local scales. This conclusions and outlook section is neither exhaustive nor conclusive, rather, it aims to stimulate discussion of the substantial challenges in meeting the existing biodiversity targets identified in the report. These are closely related to: 1) the dominant worldview that fails to recognise how intimately interwoven humans and nature are in social-ecological systems, 2) knowledge production and mobilisation, 3) the will to experiment, innovate and learn (adaptive co-management approach), 4) the capacity to support such experiments (flexible institutions in an adaptive governance setting) and 5) an openness to uncertainty and surprise (inherent to complex adaptive systems and due to the impacts of global change).

4.1 CHANGING THE CURRENT WORLDVIEW

Despite the significant scientific consensus on the occurrence and impacts of global change, including biodiversity loss, there is little action. If the notion of society as external to the environment rather than being tightly coupled to it prevails then actions to halt biodiversity loss and achieve a sustainable development will have limited impact and engagement will be short-lived. The concept of “ecosystem services” has, however, been a great tool in communicating the inter-dependence between social and ecological systems. The next, and ongoing, step is to quantify this dependence and understand the mechanisms behind this (see section 4.2) in order to better integrate this understanding into not only decision-making, but also how we do business. Already initiatives are emerging, for example the World Resources Institute has developed the Corporate Ecosystem Services Review. This is a methodology for corporate managers to proactively develop strategies for managing business risks and opportunities arising from their company’s dependence and impact on ecosystems. This is a step in changing the corporate sector’s view of the environment and their interaction with it, and a reminder that this shift must occur across sectors.

4.2 IMPROVING THE KNOWLEDGE BASE

In terms of the knowledge base from which to develop post-2010 biodiversity targets, there are two aspects in particular that need to be addressed: 1) completing knowledge of biodiversity and the management practices that sustain or degrade the long-term capacity of biodiversity in generating ecosystem services, but equally important is 2) mobilising and synthesising existing knowledge and coordinating future research efforts (see Box 28 for examples).

There are gaps in basic understanding, and these gaps become more important with the degree of complexity being assessed – from species identification to understanding and assessing resilience of these social-ecological systems. As seen by the indicators presented in Box 4, the currently used indicators tend to overlook ecosystem interactions and dynamics (internally and across scales), limiting their usefulness in assessing the sustainability of ecosystem service provision. Nevertheless, several tools exist to address these challenges:

Box 28: Suggestions for improving knowledge on the ecological underpinnings of service provision and the methodologies for accessing ecosystem services at multiple scales.

- Quantifying the characteristics of biodiversity required to provide ecosystem services at different scales.
- Understanding interactions between ecosystems, ecosystem services and habitat, and determining whether minimum habitat area thresholds for the longterm provision of ecosystem services can be defined.
- Creating arenas for collecting local and traditional ecological knowledge, as well as means of improving the compatibility of different forms of knowledge.
- Developing methods for up-scaling local impacts and responses to landscapes and regions.
- Experiments on the effects of changing different components of biodiversity on ecosystem services at a management scale and ‘natural experiments’ based on real land-use situations.
- Promotion of systematic and formalised interdisciplinary research between the natural and social sciences.

Ecosystem Service Assessments

Several recent ecosystem service assessments (e.g. MA 2005, TEEB 2008) focus on the capacity of ecosystems to provide ecosystem services and may be good enough indicators of ecosystem and biodiversity health. Furthermore, these assessments can be applied at different scales, allowing the identification of cross-scale influences of changes. They also permit monitoring of trends over time by establishing baselines to help formulate targets. Given their anthropocentric basis, they address human well-being, and are accessible to policymakers.

Assessing Resilience of Social-Ecological Systems

The Resilience Alliance has developed two Workbooks for assessing resilience of social-ecological systems, one targeting practitioners in the field of natural resource management and the other for scientists familiar with the concept of resilience and system dynamics (The Resilience Alliance 2007a, b). These are available online and are designed as guidebooks, helping users through the assessments. This allows assessing social-ecological systems’ resilience and can enable comparative and monitoring studies. Based on resilience theory, the assessment targets understanding a social-ecological system’s dynamics and how changes in certain variables affect the overall functioning of both the social and ecological components of a system. This can again be more useful than individual indicators of for example species diversity.

A framework for analysing sustainability of social-ecological systems

Ostrom (2009) has developed a framework for assessing social-ecological systems’ sustainability. This framework is based on core sub-systems (in turn defined by a series of variables) and characteristics of a social-ecological system including the resource in question, the institutional setting as well as social settings, and their interactions. Given the very large number of combinations possible, this framework mirrors the complex reality of these systems rather than simplifying them to a few variables as done by most models. The advantages of this framework approach include that: it allows an assessment of existing knowledge of the system in question as well as providing an arena where researchers (and stakeholders) from different fields can share and join their understandings of the system; and it provides a basis for comparative studies to elucidate important variables (under certain conditions).

There is currently a high degree of political will to address climate change and biodiversity-related challenges. The salience of these issues can likely, in part, be attributed to the publication of the Millennium Ecosystem Assessment Report (MA 2005), the Stern Review on the Economics of Climate Change (2006) and the IPCC Fourth Assessment Report, AR4 (2007). The scientific, political, public and private attention to the findings of these reports have contributed to stimulating the discussion on the establishment of an Intergovernmental Platform on Biodiversity and Ecosystem Services, an IPBES. This discussion has been based on the conclusion that there is a need to continuously build knowledge regarding biodiversity, resilience and ecosystem services and the linkages between these. The conclusion is that there is a gap between scientific knowledge and policy-making from local, national to global level and that there is a need for an interface between science and policy-making.

The main focus of IPBES should be to deliver timely and credible, evidence-based scientific and policy relevant information, mirroring the IPCC. As such IPBES is hoped to put the loss of biodiversity, ecosystems and their services at the top of the political agenda. The platform will need to work in close collaboration with the scientific bodies supporting the other biodiversity-related conventions and Rio conventions and also link to the MDG process. For the platform to have legitimacy and scientific integrity, it is likely important not to distract the activities of the panel with direct engagement in capacity building. Also the success of the platform will depend on an accepted process for nominating scientific experts, technical rigor and consistent methodologies for the assessment process and independent peer-review. After the first UNEP led stakeholder meeting in Putrajaya, November 2008, there has been substantial discussion about the context and scope of an IPBES. Clearly, there is a need for a consistent EU position on the establishment of an IPBES as support for the CBD and related biodiversity processes in time for the second UNEP dialogue in Nairobi, October 2009, coupled with a clear commitment to allocate funds for an IPBES, in particular for capacity building in third world countries which lack the capacity to fully and actively participate in scientific activities. The content of this report clearly emphasises the importance of a global, periodic assessment to secure evidence-based support to governance and management of ecosystem services and biodiversity, and thereby justify and support political leadership to implement measures and ensure policy coherence.

Another important issue is to improve knowledge on, and methodologies for, the valuation of ecosystem services, which has been taken up by TEEB, the global EU study on The Economics of Ecosystems and Biodiversity launched in 2007 as part of the Potsdam initiative. TEEB is now in Phase II, targeting policy-makers at national and local levels, businesses and consumers. Its findings should raise awareness of the value of biodiversity and effective action as well as the relative costs of inaction, and thus help the development of cost-effective policy responses. Phase II of TEEB is looking at all other ecosystems than forests; the only ecosystem valued in Phase I. A challenge for Phase II is building a framework on how to value ecosystems and biodiversity in the context of complexity, ecosystem and social dynamics, thresholds and resilience.

4.3. CREATING ROOM FOR ADAPTIVE CO-MANAGEMENT

Throughout this report we conclude that business-as-usual is simply not an option to solve the interacting local to global change challenges hitting and facing humanity. Furthermore, a number of small-scale, contextual studies have been presented in Chapter 3 that demonstrate the context-specific approach that management needs to take (and governance needs to support) versus blueprint solutions. The chapter discusses how an adaptive co-management approach can stimulate social learning and innovation, build trust and support resilience of social-ecological systems: all important for improving sustainability of social-ecological systems. Such initiatives are however relatively rare and need both supportive policy frameworks and a diversity of incentives to emerge. In line with this, adaptive European policies related to freshwater (the EU Water Framework Directive) and marine resources (the Marine Strategy Framework Directive) are currently being implemented. The EU Water Framework Directive (see Box 23), and its potentially conflicting components (top-down, technocratic

ones and bottom-up, process- oriented ones) highlights the need for these new initiatives to be designed in a coherent manner to ensure long-term legitimacy (see also Box 29).

There is also potential for building a European research and development fund for adaptive co-management experimentations, coupled to a database and virtual knowledge-sharing tools in order to stimulate an adaptive approach within the European Community. The rationale for such a fund would build on the MA conclusion that the institutional capacity to deal with environmental degradation evolves more slowly than the pace of degradation. To meet this challenge, the purpose of such a fund would be to support flexible and large-scale experimentation, and co-ordinate smaller scale experiments, with innovative governance and management principles (that build resilience, reduce vulnerability and mitigate undesired change). These would be built on the indicators and assessments described in section 2.1.

Box 29: Measures to improve the political and institutional knowledge base.

- Better communication and education so that general knowledge and acceptance of the key importance of natural systems are improved.
- Promoting public participation to set objectives for ecosystem service delivery in relation to stakeholder preferences and values.
- Investigating the risks associated with conservation based on ecosystem service delivery.
- Analysing the plurality of decision and communication contexts within societies and assessing the relative merits of different classification frameworks, evaluation methods and decision support tools for these contexts.
- Developing decision support systems to assist managers.

4.4. SUPPORTING CAPACITY BUILDING AND FLEXIBLE INSTITUTIONS

The above-suggested fund for European adaptive co-management can contribute to building institutional capacity and consistent methodologies to research, implement and follow up of European biodiversity-related policies. Support, in the form of funding, collaboration and for implementation is needed. Capacity is needed at all levels, from data collection to institutional capacity. The MA has contributed substantially to developing methodologies for conducting sub-global assessments of biodiversity and ecosystem services. However, substantial capacity building needs still exist in developing countries, implying that the ongoing follow-up process of the MA should include a substantial component of capacity building in developing countries, and the EU has an important role to play in providing financial support. The large global demand for capacity building also calls for a necessary partnership with private actors. For example, a large telecom company recently improved the infrastructure for 3G telephones throughout Africa. Interestingly, this infrastructure is also fitted with automatic measuring stations for climate-related variables and will contribute substantially to the knowledge base of African climate change. Analogous innovative support to scientific and administrative capacity should be encouraged.

Adaptive co-management and networks greatly increase the amount and flow of information and the demand for involvement of the scientific community and the authorities. This increase is particularly intense when the dominant management system is to be fed with one kind of information and a new system is emerging and generating different type of data and information (as described in examples Boxes 15 and 19). This situation is further complicated when a paradigm shift is occurring, for example a shift from management based on the interaction of professional fishermen with a single species to one based on interactions between various users and ecosystems. Hence European academic and management systems should deepen their efforts in participatory research and support these changes by developing extension services (as described in Boxes 15 and 23).

4.5. DEALING WITH UNCERTAINTY AND SURPRISE

Moving away from steady-state approaches and blue-print solutions to more flexible governance structures and processes that acknowledge complexity is a demanding, but necessary, transformation for dealing with uncertainty and surprise of social-ecological systems. This challenge involves maintaining effectiveness of measures while investing in learning and experimentation. It involves nurturing a diversity of management and monitoring initiatives while finding common ground for coordinated actions to halt biodiversity loss and maintain ecosystem service provisioning. It involves continuously trying to reduce uncertainty by improving knowledge and monitoring, while also improving the ability to live with the uncertainty and surprises that are inherent of complex social-ecological systems. The IPBES discussed above could be an important mechanism for reducing uncertainty by identifying future trends, using technologies of horizon scanning, to discover emerging crises and thereby assist in preparing governments and regions in identifying response capacity to new issues. Living with inherent uncertainty and surprise requires institutional diversity, coordination and collaboration among actors and institutions, bridging organisations that can facilitate such collaboration and learning, and leadership.

The growing insights of the risk for abrupt human-induced environmental change at the regional and even global scale, raises new concerns of the risk of crossing tipping points in biophysical systems of the Earth that could cause deleterious or even catastrophic outcomes for humanity (see Box 6). Recent scientific advancements to address such large scale risks, has proposed a new planetary boundaries framework to allow for governance and management within a safe operating space, where human development occurs within defined boundaries for key Earth system processes. Biodiversity loss has been identified as one among nine key Earth System processes that, according to this research, qualifies as a planetary boundary. This framework, which combines scientific advancements in Earth system science and resilience research, provides new challenges for governance and management, particularly the capacity to deal with uncertainty and surprise, and to operationalise the precautionary principle.