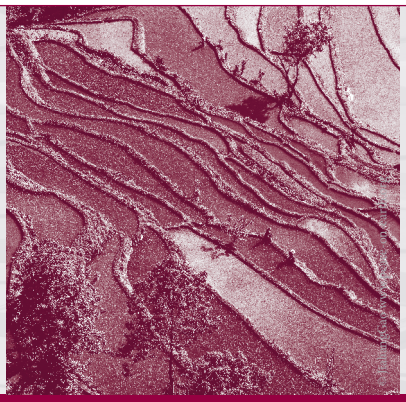
TAB OFFICE OF TECHNOLOGY ASSESSMENT AT THE GERMAN BUNDESTAG

VALORIZATION OF BIODIVERSITY



TAB-Fokus no. 4 regarding report no.161 January 2015

Summary

- Biological diversity has been continuously threatened by anthropogenic influences and is considered to be one of the most important subjects of protection. Despite long-standing political efforts, it has not yet been possible to stop the loss of biodiversity.
- Therefore, in addition to traditional conservation measures, politics has begun to increasingly focus on innovative economic approaches (valuation and capturing).
- Due to the complexity of biodiversity, its economic valuation faces considerable uncertainties. There still is a substantial need for further interdisciplinary research on the matter.
- In view of various undesired side effects, economic instruments require a strong regulatory framework as well as a careful balance of interests, particularly in developing countries characterized by legal uncertainties.

What is involved

Although some progress has been made, the **track record of nature and biodiversity policy proves to be rather modest** so far. The international community clearly failed to reach the goal of stopping the loss of biodiversity at the global, regional and national level until the year 2010.

This circumstance is associated with high costs for society, because intact ecosystems provide manifold services (so-called ecosystem services) the value of which, however, have remained widely invisible so far. In order to overcome the associated **blindness of society regarding the costs of biodiversity loss** and to achieve a more economical way of using natural resources, great hopes are being placed on economic approaches. These start at different levels:

Economic valuation of »natural capital«: It aims at unfolding the manifold benefit dimensions of biological diversity as well as its monetary values and at integrating them in social decision-making processes.

Policy instruments for capturing the value of biodiversity: Politics can promote a considerate treatment of nature by means of **incentive-based or market-based instruments** – either by disadvantaging/rewarding undesired/desired behaviour (price-based mechanisms) or by limiting the total use of natural resources (quantity-based approaches).

Encouraged particularly by the international TEEB study (»The Economics of Ecosystems and Biodiversity«, 2007–2010), economic approaches are gaining more and more traction in biodiversity policy. The implications of this paradigm shift however have still not been fully examined. While proponents are referring to it as a »win-win situation« for nature and humans, critics are afraid of the counterproductive effects due to an increased commodification of nature.

Economic valuation: various imponderabilities

The economic valuation of biodiversity and ecosystem services faces many reservations and is the subject of controversial debates revolving around diverging ideas regarding the **scope and limits of economic valuation methods**. As a matter of principle, these methods offer the opportunity of gaining a more comprehensive perspective than before regarding the benefit dimensions of nature by identifying them as comprehensively as possible and by monetizing them, if possible. However, they still have to struggle with **several uncertainties** and inaccuracies. Besides the distortive effects related to methodology, particularly the still very **fragmentary knowledge and data base regarding biological diversity** and the underlying ecological processes is of significance.

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Topic initiative

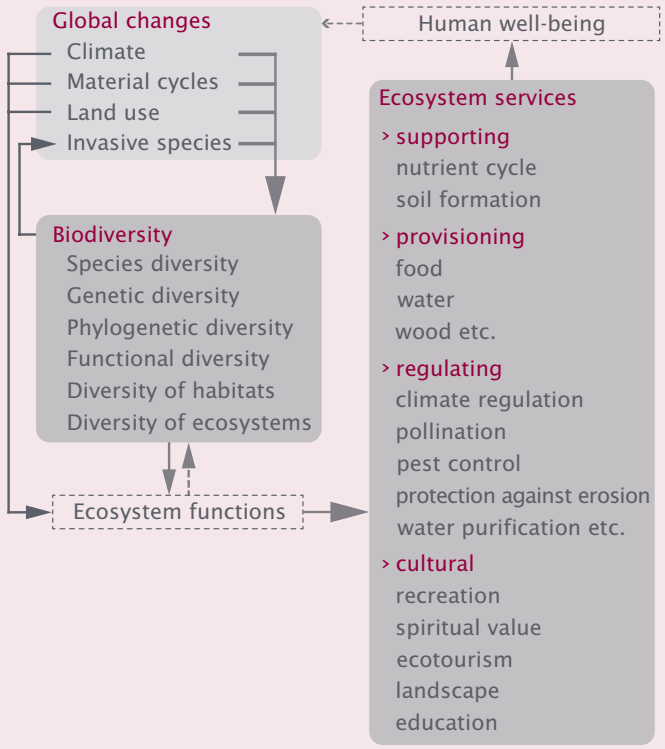
Committee on Economic Cooperation and Development

As a consequence, in more complex valuation situations and specifically with regard to the immaterial services of ecosystems and of biodiversity, it is not to be expected that economic valuations are accurate.

Besides problems regarding quantification and validity, particularly the **normative basics** of economic valuations are subject to criticism. They come into effect with regard to methods for decision-making such as cost-benefit analysis which rely exclusively on **benefit-oriented aspects and efficiency criteria**. Thus, equity aspects for instance which play a major role in nature conservation are considered to be negotiable only to a limited extent from an economic perspective. This is particularly significant, if **critical threshold values of ecosystems are** exceeded or if essential goods are at risk, as this might involve controversial questions of distribution.

Altogether, a **differentiated assessment** of the opportunities and risks of economic valuations is appropriate. Already at this stage, despite existing uncertainties, economic valuations can be a **valuable political decision-making support-tool**, provided that a careful institutional implementation and a careful reflection of specific valuation results are given. Thus, economics can help to unfold the welfare effects of different nature-oriented measures more systematically and comprehensively than before. However, the cost-benefit calculation forming the basis of economic decision-making methods should not be considered to be the relevant decision-making maxim. In view of the major uncertainties of valuation, there is a threat of wrong decisions the consequences of which mainly future generations would have to bear. Last but not least because of equity considerations, the results of economic valuations thus have to be embedded into a **broader framework of consideration** also including **non-monetizable aspects** – as it is common practice in Germany.

Biodiversity and ecosystem services: complex interactions



Policy instruments: a broad approach is required

Regardless of an economic valuation, economic instruments offer the potential of achieving nature conservation objectives at a lower cost for society than it is possible by means of traditional protection measures. However, so far only **limited practical experience** is available regarding the effects of these instruments. A glance at economic climate protection instruments illustrates that the **requirements regarding both an effective and efficient as well as socially viable implementation are very high**. Thus, the effectiveness of the European emissions trading system currently appears to be doubtful due to an excess supply of allowances. Moreover, first experiences regarding afforestation projects related to climate policy

Price-based instruments

- **Payments for ecosystem services**: The objective is to provide incentives for a sustainable management of ecosystems by compensating the land user for costs incurred and for loss of revenue.
- **Ecological fiscal transfers** are intended for public actors. The focus here is on a reform of financial compensation. It shall be complemented by an ecological component in order to reward more systematically public nature conservation services which are mainly provided by rural and semi-natural areas.

Quantity-based instruments

- **Habitat banking:** Compensation measures which are required by law (impact regulations) in the context of inevitable interventions in nature and in the landscape will be certified and made tradable.
- **Tradable development rights**: Following the example of the emissions trading system, land use will be limited with regard to quantity by stipulating that any stakeholder who wants to use an area in a specific way must have the corresponding rights which can be bought and are tradable.

(CDM, REDD+) show that particularly in developing countries numerous non-intended socio-ecological side effects are to be expected.

These **practical problems of application are getting worse** with economic instruments for biodiversity protection. This is due to the complex properties of »biological diversity« as a heterogeneous subject of protection which cannot be controlled by means of a simple parameter. Thus, the **risk of misguided control strategies and undesired side effects** (shift effects and distributional effects) increases which will raise the need for appropriate administrative control measures and reduce cost-effectiveness correspondingly.

For this reason, economic instruments for biodiversity protection taking biodiversity directly as a starting point generally do not appear to be very likely to succeed. The principle of equivalency of the so-called habitat banking – meaning that interventions in nature shall be compensated for equivalently – is difficult to implement and is an example for the difficulties mentioned above. An **indirect control** by means of alternative target parameters which are better to operationalize seems to be more promising. A system of **tradable development rights** (for the quantitative limitation of communal land use), **ecological fiscal transfers** (to reward public nature conservation efforts) as well as **payments for ecosystem services** (to reward private landowners for providing ecosystem services) could be considered.

However, the effects eventually resulting from these instruments basically depend on their tangible implementation and on the existing policy mix:

- In view of versatile and quite serious social and ecological side effects, **economic efficiency criteria** should **not be the only determining factors** with regard to the design and implementation of economic instruments.
- Besides economic measures, **traditional conservation measures are still needed as well** to protect particularly sensitive ecosystems. In the end, the task of achieving a **tailor-made mix of instruments** for biodiversity conservation is likely to be the major political challenge.
- Biodiversity policy has to be understood as a **cross-sectional task** which should involve all relevant policy-making sectors. Particularly a **consistent protection of the environment** is indispensable to get under control the major drivers responsible for the loss of biodiversity (pollutant and nutrient inputs etc.).

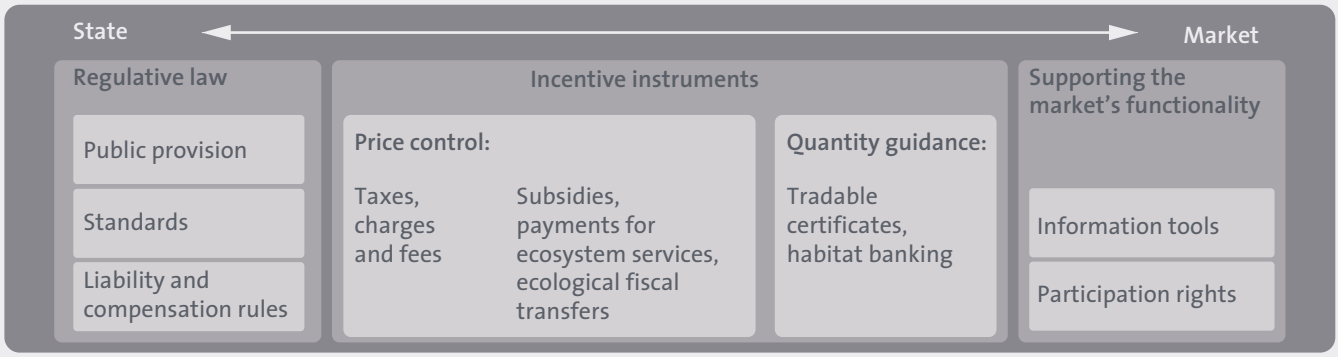
Diversified need for research

Valuing and capturing biodiversity raises **numerous research issues** in various disciplinary areas. The cornerstone is a sufficient knowledge and data base regarding the underlying ecological processes, the understanding of which, however, is only rudimentary so far. There still lacks a comprehensive examination particularly of the complex **interactions between biodiversity and various ecosystem services** which are highly relevant for land use decisions.

To shed some light on these complex contexts, **new technologies** (such as DNA barcoding, remote sensing), **new experimental approaches** and, above all, **integrated observation systems** are required. The latter should be able – with regard to the most important ecosystems – to provide a representative overview of a wide range of both biodiversity facets and ecosystem services under changing environmental conditions. This cannot be achieved by means of individual projects, but requires the increased **bundling of pure basic research and applied research**.

A **national monitoring center** bundling and harmonizing the different activities certainly would be helpful. The targeted **extension of existing inventory programs** (German National Forest Inventory, soil condition survey etc.) would also offer another possibility for achieving a more integrated biodiversity research. **Economic valuation methods** have to be improved and further developed as well. Moreover, there is a substantial **need for economic research in practical terms** – mainly with regard to the tangible impacts of policy

The continuum of environmental policy instruments



instruments which, unlike their theoretical preconditions, are researched only insufficiently.

Due to the inherent moral and social aspects of the issue, an **interdisciplinary exchange** is of major significance. Currently, the **perspective of the humanities and social sciences**, however, plays only a marginal role with regard to the debate on valorization. To change this, existing research and funding structures would have to be improved.

Conservation of biodiversity as a global challenge

International biodiversity policy ranges in a basic area of conflict characterized by the **contrast between developing countries which are rich in biodiversity and industrialized countries with a low level of biodiversity**. The opportunities and risks of an economic valorization of biodiversity are perceived differently at the international level as well: While the issue hardly attracts the public's attention in industrialized countries, it bears a sometimes **considerable potential for social conflicts** in developing countries characterized by poverty.

On the one hand, these differences are due to **diverging values and conceptions of nature**. On the other hand, also tangible **conflicts of distribution and use** in connection with the new global carbon and biodiversity markets are reflected here. For many people in developing countries, natural resources are of vital importance. At the same time, they have to face **legal uncertainties** which threaten to increase considerably if economic instruments will be implemented.

At international level, the **discourse on climate policy** represents a substantial driving force of this tense development. The focus is particularly on the recently formally adopted forest protection mechanism REDD+ which also takes up aspects of biodiversity and development policy. Scientific studies reveal that the **conflicts of aims between climate protection, biodiversity conservation and securing the rights of local communities** can be substantial. For this reason, it seems to be necessary to integrate biodiversity issues as well as aspects of human rights and proprietary rights even more into international climate negotiations in the future. Moreover, the success of REDD+ considerably depends on a differentiated **capacity development** within the framework of bilateral development cooperation.

A look at the international discourses illustrates the **imponderabilities** associated with valuing and capturing biodiversity. In order to seize the unequally distributed opportunities offered, the conservation and sustainable use of biodiversity as a public good has to be understood – more than ever before – as a **major societal (and global) challenge** which should not be left to the market alone, but furthermore requires political commitment, public funds and social dialogue, particularly in times of scarce public resources.

TAB report no. 161
Inwertsetzung von Biodiversität
Christoph Kehl, with the support of Arnold Sauter

Website of the project
www.tab-beim-bundestag.de/en/research/u10200.html

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