

# HANDBOOK OF BIODIVERSITY VALUATION: A GUIDE FOR POLICY MAKERS

## EXECUTIVE SUMMARY

***Biodiversity is valuable, as recognised by the Convention of Biological Diversity...***

This handbook focuses on the nature of values associated to biological diversity (biodiversity) and the methodological approaches that can be adopted to assign values for policy purposes. It adopts a variety of case studies to illustrate the valuation process in OECD countries.

***... yet partly because much of the value is implicit rather than explicit, biodiversity continues to be lost at unprecedented rates.***

All societies depend on biodiversity and biological resources either directly or indirectly but their value is predominantly implicit rather than explicit. For biodiversity and many biological resources the absence of apparent value combined with absent or poorly defined property rights creates a problem of over exploitation and unregulated use. Increasing development pressures have led to an unprecedented rate of biodiversity loss. The resulting impacts on global well-being are sufficient to warrant a global convention - the Convention on Biological Diversity - to co-ordinate an international conservation effort.

***Biodiversity conservation is often a low priority because it is not easy to value.***

While the Convention on Biological Diversity (CBD) stresses the role of concerted global action, the stark reality is that global action is only the sum total of actions taken within nation states that host our biological patrimony. Individual states and regions within states face conflicting priorities in the selection of development paths. Biodiversity conservation is often a low priority simply because there are measurement and valuation problems; biodiversity defies easy description and quantification. What cannot be quantified or is difficult to monitor and evaluate is easy to disregard. This adage also applies to the concept of value. While value has a variety of meanings it is manifestly true that the absence of an economic value for biodiversity and many biological resources means that they fail to compete on a level playing field with the forces that are driving their decline.

***This handbook considers both economic and non-economic values of biodiversity...***

This report emphasises the need to assign value to biodiversity as a prerequisite to an efficient approach to resource allocation. Biodiversity is a scarce and valuable global resource and conservation decisions must be taken to maximise this value within inescapable budget constraints. The volume is mainly though not exclusively concerned with the economic valuation of biodiversity. The importance of economic valuation is recognised in the CBD context. CBD's Conference of the Parties (COP) Decision IV/10 acknowledges that "economic valuation of biodiversity and biological resources is an important tool for well-targeted and calibrated economic incentive measures", and encourages the Parties to "take into account economic, social, cultural, and ethical valuation in the development of relevant incentive measures". While there are exceptions to the need to prioritise economic values over other cultural, traditional and spiritual values, the area of economic valuation has a sound theoretical foundation that can help clarify the tradeoffs implicit in public policy. Nevertheless, this volume does signal the limitations of an economic approach and considers how economic and non-economic values are related and can be reconciled.

*... discussing what biodiversity is, the difficulties of measuring it, and the consequences of its loss.*

In defining biodiversity Chapter II sets out the complexities inherent in the term and distinguishes between diversity and the biological resources that harbour diversity. The chapter highlights some of the difficulties in measuring the former but illustrates how some understanding of diversity can provide interesting insights for the design of an efficient conservation strategy. Data requirements for a consistent approach based on diversity measurement are formidable and biological resources (e.g. species and ecosystems) are adopted as the more manageable surrogate for conservation strategies. The chapter then considers the ecological consequences of biodiversity loss and evidence that suggests that loss is proceeding at a historically unprecedented rate. A distinction between economic and non-economic value criteria is introduced as the subject matter for Chapter III, which addresses some of the contrasting value systems being advanced in the global conservation debate.

*Before detailing methodologies, the handbook discusses the different notions of biodiversity values.*

The core of this debate concerns what may be conflicting stances on the relevant notion of value. For some people, the issue is about what is right or morally justified, and there may be only limited or negligible reference to cost and to what people may want. For others, what people want is itself a moral stance because of a presumption that providing what is wanted itself reflects a value judgement about the sensitivity of policy to wants - the 'democratic presumption'. Additionally, costs are very relevant because they represent the alternative use of funds and those alternative uses may themselves have moral content. There is no easy resolution of these different approaches and none is attempted in this manual. Those who favour the former approach will tend to want priorities for conservation sorted out by a legislature and a political process. Those who favour the latter will tend to opt for procedures such as cost-benefit analysis and multi-criteria analysis as prior requisites for what is ultimately always a political process.

Ultimately, whatever the value stance, a consensus exists around the imperative of safeguarding as much biodiversity as possible, subject to some consideration for the cost of doing so. Measured in terms of species, features or functions, this imperative embraces philosophical differences and establishes the minimum objective to one of cost-effectiveness of competing uses of a conservation budget. However budgets are determined, they should be used so as to maximise biodiversity conserved.

*On valuation methodologies, the report discusses both non-monetary and qualitative decision-making processes.*

Cost-effectiveness analysis of conservation policy is however hampered by the fact that most programmes attempt to deliver multiple, frequently incommensurate outcomes. How these outcomes should be prioritised or weighted leads to another significant methodological divergence between approaches that use money or price weights and methods that use scores perhaps derived from expert group or public opinion. The latter weighting method characterises multi-criteria or multi-attribute modelling. The use of monetary weighting defines a cost-benefit approach to decision-making. The determination of monetary values for biodiversity is a central theme of later chapters of this volume. The derivation of these values allows biodiversity to compete on the same basis with other competing calls on public funding.

Prior to expanding on this theme, Chapter IV addresses other qualitative decision-making processes that are also essential features of the philosophical debate. Complex environmental issues involve numerous stakeholders and many governments are responding to the call for more social involvement, public consultation and participation in policy decisions. Deliberative and inclusionary approaches seek to provide alternative arenas for eliciting social preferences. They do this by exposing a sample of the general public to the necessary scientific and social information to allow that group to reach a consensus position on a particular scientific priority or complex

public policy issue. Citizen's Juries and Consensus Conferences are the most well known formats for this process and have become formal elements of decision-making in several OECD countries. For some the consensus process somehow provides a better or fairer reflection of social preferences rather than the more restricted private consumer model implicit in cost-benefit analysis. While participatory approaches can introduce other biases into decision-making, there is no reason to assume that they cannot themselves be used as an input to a more holistic cost-benefit test. Indeed, the two may be successfully combined.

***Economic frameworks and specific valuation methods are discussed, including time discounting and how time preference rates may be adapted to take into account biodiversity issues.***

Chapters V to IX concentrate in more detail on the economic framework and the specific valuation methods that allow biodiversity to enter into the cost-benefit decision-framework that is assumed to represent the conservation 'versus' development trade-off. Chapter V introduces the concept of time discounting and considers how time preference rates may be altered to account for the specific dilemmas faced by biodiversity conservation.

***This is followed by an in-depth look at economic values and the economic methods available to assess them when markets fail.***

Chapter VI spells out the economic interpretation of value and outlines the taxonomy of values associated with biodiversity. This range from direct use values associated with market prices through to non-use values that require more sophisticated enquiry methods to measure preferences not revealed in the market. The range of methodological approaches is then detailed in Chapters VI and VII, which discuss the range and limitations of economic valuation methods. The development of these methods is a fast moving research area for environmental economics, and their application to biodiversity presents particular problems related to the difficulties in identifying the nature of the good called biodiversity or in describing it to respondents.

***A controversial but important tool - benefits transfer - is examined. It facilitates 'rapid appraisals' of biodiversity worth, but is not without methodological challenges.***

Environmental valuation studies are generally time consuming and expensive to undertake and the number of possible values necessary for a complete understanding of the total economic valuation of biodiversity is likely to be large. In response to the urgent need for 'rapid appraisal' information some environmental economists have begun to consider the feasibility of borrowing results from existing studies and transferring them - suitably modified - to another similar site where information is needed. This practice is known as benefits transfer and is detailed in Chapter IX. Benefits transfer is not entirely new since cost-benefit appraisals have frequently transferred pre-existing externality values (e.g. a standard value of a statistical life is commonly used in different transport appraisals) for completeness. In the context of biodiversity, the process is arguably more complex. The process introduces a range of methodological challenges that make benefits transfer an interesting and evolving study area in its own right.

***This Handbook should help policy-makers and practitioners to identify and implement successful biodiversity valuation methods, thereby furthering understanding of our common natural heritage.***

Chapter X concludes the handbook by locating the cost and benefit information in a series of policy contexts ranging from land use planning to the determination of legal damages. The chapter reiterates the economic nature of the choices inherent in conservation policy and priority setting while considering some of the criticisms of a cost-benefit approach. An important caveat is that biodiversity conservation is characterised by a high degree of uncertainty. This means that whatever we learn from biodiversity valuation, a precautionary approach may still be needed to guide subsequent conservation or use decisions.

# T H E O E C D E N V I R O N M E N T P R O G R A M M E

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