

**INCENTIVE MEASURES TO PROMOTE THE CONSERVATION AND THE SUSTAINABLE USE
OF BIODIVERSITY**

-- FRAMEWORK FOR CASE STUDIES --

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Paris

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Incentive measures to promote the conservation and the sustainable use of biodiversity

-- Framework for case studies --

1. Introduction

The focus of the programme of work of the OECD Expert Group on the Economic Aspects of Biodiversity under the new two-year mandate 1997/98 is the analysis of the experiences of OECD Member countries with the implementation of incentive measures for the conservation and the sustainable use of biodiversity. To this purpose, a series of case studies from OECD Member countries will be produced according to a common framework. The results from the case studies will be synthesised in a handbook containing guidance for the implementation of incentive measures. The handbook will be designed to provide pragmatic policy advice to the Member countries on the implementation of incentive measures in order to promote the conservation and the sustainable use of biodiversity in instances where human activities exert pressures on biodiversity. It is a continuation of the OECD work referenced in Decision III/18 of the Conference of the Parties to the Convention on Biological Diversity and aims at facilitating the implementation of Article 11 of the Convention.

The framework presented below has been developed on the basis of several sources. First and foremost it is building on the previous work of the Expert Group, and in particular *Saving Biological Diversity: Economic Incentives* and the results of the OECD Conference on Incentive Measures for Biodiversity Conservation and Sustainable Use in Cairns, 25-28 March 1996. Second, it is taking into account of work that has been completed in the context of the Convention on Biological Diversity. This includes the "Recommendations on Incentives for Biodiversity" of the "Statement to the Second Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice" by the 4th Global Biodiversity Forum in Montreal and the background paper on the "Sharing of Experiences on Incentive Measures for Conservation and Sustainable Use" (UNEP/CBD/COP/3/24) for the Third Meeting of the Conference of the Parties to the Convention on Biological Diversity. Third, it has benefited from bilateral comments by several delegations from Member countries and by the participants of a preparatory meeting held on 20 September 1996 in Paris.

2. Purpose of case studies

The case studies on the implementation of incentive measures to promote the conservation and the sustainable use of biodiversity and to alleviate pressures stemming from human activities will form the basis of a handbook for the implementation of incentive measures. Case studies should be short, succinct summaries of experiences of about 20 pages of length. They should focus on the planned or actual outcomes of the implementation of incentive measures, the reasons for this outcome and the lessons learned. The time horizon for the completion of the case studies would be the end of 1997.

The case studies and the handbook are designed to comply with the items 2. and 4. of the Mandate of the Expert Group on the Economic Aspects of Biodiversity:

- to fulfil the need of OECD Member countries for pragmatic advice on policy guidance regarding the implementation of incentive measures for the conservation and the sustainable use of biological diversity; and

- to focus its work, in particular, on the development of *pragmatic case studies* of the implementation of incentive measures in OECD Member countries, resulting in the development of *practical guidance on the implementation of incentive measures*. Case studies would concentrate on
 - a) the study of *impediments to the adoption of incentive measures* and the elimination of the unintended *adverse effects of incentives* that promote activities exerting pressure on biological diversity taking into account the existing OECD work programme in this area;
 - b) and *the identification of economically and socially sound incentives* for the conservation and sustainable use of biological diversity with a focus on market-based economic instruments with attention to social concerns and needs, cost-effectiveness, valuation, and institutional arrangements.

New and original studies, as well as existing studies can be contributed. However, existing studies would have to be transformed in order to conform with the common analytical framework of all case studies presented below. The framework has the following two purposes. First, to ensure that all relevant points of the case studies under analysis will be covered; and second, that comparability between the different case studies is ensured. Adherence to the framework by the individual researchers on the case studies will enable the Secretariat to proceed towards synthesising the different case studies in a meaningful way and draw policy lessons.

Successful incentive measures will address the underlying causes of biodiversity loss directly. A particular focus of all case studies would be in this context the identification of adverse incentives promoting the activities of economic sectors that exert pressures on biodiversity. Attention shall be paid to subsidies, including direct transfers, trade measures, preferential tax treatment and preferential infrastructure provision. Of great importance is to which extent after the elimination of adverse incentives the sustainable use of biological diversity can contribute to employment and growth, in particular for indigenous populations. Detailed attention shall also be paid to the legal, institutional and social context of the implementation of the incentive measures.

Each case study will be grouped according to the ecosystem and the sectoral activities it discusses. The main groupings are the eight eco-systems coastal zones, marine eco-systems, arable lands, forests, wetlands, mountainous and submountainous regions, grass- and rangelands and arid- and semiarid areas. Concerning human activities or sectors, the following eight sectors have been identified as the most relevant areas for study: tourism, fishery, road transport, agriculture, forestry, land-use, shipping and industry. The grouping of the case studies according to ecosystems makes the work compatible with the approach taken by the Convention on Biological Diversity. But studies covering the impacts of a particular sector on different ecosystems are welcome and can be related to the common framework.

The table below relates ecosystems and the most relevant sectors of human activity exerting pressures on biodiversity. The table just provides an indicative overview. The strength of impact of sectoral pressures varies considerably between sectors and ecosystem. The table just provides a qualitative indication of 'significant impacts'. Strength of impact can also be expected to vary, sometimes considerably, from country to country. Countries and individual case study authors might add different interactions and are welcome to provide case studies on those instances of interaction which they consider most pertinent.

Table 1.
Indicative overview of impacts of human activities on ecosystems

	ECOSYSTEMS →							
SECTORAL PRESSURES ↓	Coastal Zones	Marine Eco-systems	Arable Land	Forests	Inland Fresh-water Systems	Mounth. & Subm. Regions	Grass- & Range-lands	Arid- and Semiarid Areas
Tourism	*	*	*	*	*	*	*	*
Fishery	*	*		*	*			
Road Transport	*		*	*	*	*	*	*
Agriculture	*		*	*	*	*	*	*
Forestry			*	*		*		
Land-use	*		*	*	*	*	*	*
Shipping	*	*						
Industry	*		*	*	*			*

3. Use and overview of the framework

As in any exercise that seeks to formalise heterogeneous information in order to draw generalisable lessons, the question is to which extent the framework should allow single elements to be answered essentially in yes-or-no, or a single-entry manner, or to which extent freedom shall be given in order to better reflect the particular circumstances of each case. In connection with the framework presented here, a middle way is proposed:

Each case study submitted should adhere in its outline and in the topics treated to the major categories (modules) of the framework, i.e. those categories numbered by 1., 1.1. etc.. The lower-level categories, i.e. those preceded by a tiret, would not have to be followed one-by-one, but can be treated as suggestions for aspects to be included. Thus the overall structure of all the case studies would be the same, while maintaining sufficient openness to concentrate on the particular aspects of each case.

A special case is category 4. (“Impacts on economy and welfare”, see overview below). While of great interest to the work of the Expert Group on the Economic Aspects of Biodiversity, case studies that will be unable to provide information on these items remain acceptable. The identification of impacts on ecosystems (category 3.) is considered a sufficient condition for the implementation of incentive measures, including economic incentives. The identification of impacts on the economy and welfare, instead, is considered a helpful and desirable intermediate step but not a necessary condition.

In those cases, where a researcher would be unable to adhere even to the major categories, possibly a short explanation of the reasons should be included. The closer any given case study adheres to the common outline, the more useful it becomes in terms of its contribution to policy guidance on the implementation of incentive measures.

Overview of the framework

For reference and overview are presented the different elements of the framework without any comment. A more detailed version with comments is presented in subchapter 6.

1. General description

- Description of the ecosystem
- Description of main impacts
- Identification of incentive measure
- Identification of economic sector(s) targeted by incentive measure

2. Identification of causes and sources of pressures

2.1 Identification of sectoral activities and resulting pressures through

- pollution
- conversion and land-use
- non-sustainable use of biological diversity, including species trade

2.2 Identification of underlying causes of biodiversity loss

- missing markets or non-existent property rights
- information failure
- institutional failure
- enforcement failure

2.3 Identification of adverse incentives with negative impacts on biological diversity

- direct and indirect subsidies
- market price supports
- tax incentives
- infrastructure provision

3. Impacts on ecosystems

- impacts on genetic and species diversity
- impacts on ecosystem in general
- identification of keystone species
- impacts on ecosystem resilience
- damage to resource base

4. Impacts on economy and welfare

- direct economic losses
- economic valuation of damages to public goods (if applicable)
- effects of adverse incentives on budget, efficiency and employment
- beneficiaries of inaction and bearers of costs prior to implementation

5. *Implementation of incentive measure(s) and context*

5.1 Identification of actual or planned incentive measure

- category of measure (regulation, market incentive, property rights definition etc.)
- objective of incentive measure
- reason for choosing measure

5.2 Process of implementation and distributional effects

- beneficiaries of incentive measure and bearers of cost after implementation
- participation and negotiation
- enforcement and compliance

5.3 The role of information and uncertainty in the implementation process

- information about biodiversity value and environmental impacts
- information about economic impacts
- technical information
- cultural (indigenous) knowledge

5.4 Framework and context of implementation

- explicit legal framework and property rights (formal constraints)
- cultural, historical and social context (social constraints)
- institutions concerned (including appropriate government level)
- internal evaluation and remedial process

6. *Policy relevant conclusions*

6.1 Transferability of the experience

6.2 Lessons learned

6.3 Possible policy advice for implementation

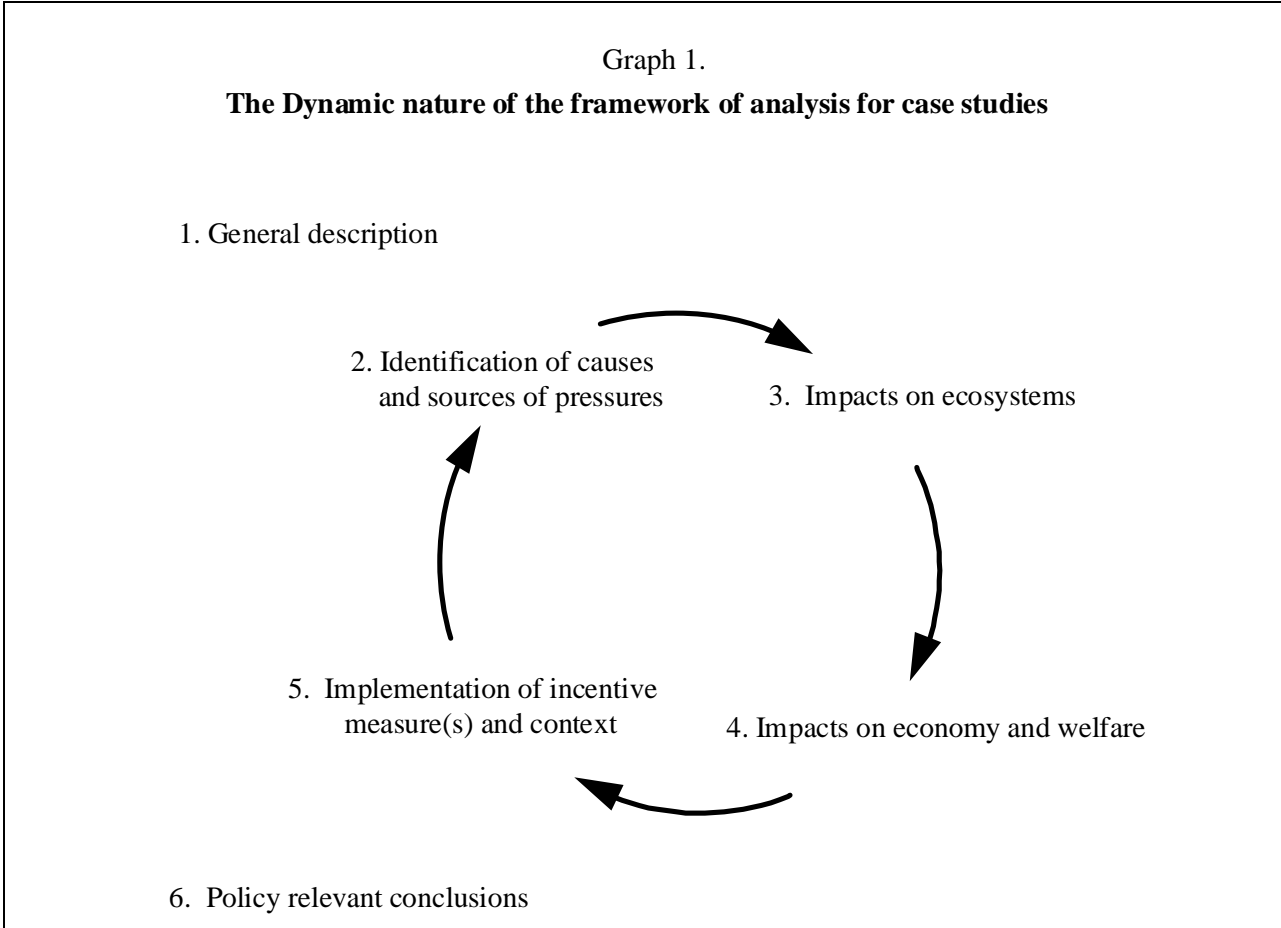
For the success of the project, it will be critical for the individual authors of the case studies to follow the outline as closely as possible.

Structure of the framework

The analytical framework for the analysis of case studies on the implementation of incentive measures has a circular structure that allows in sufficiently rich cases a dynamic analysis. As the implementation of an incentive measure will have in its turn an impact on the original causes of the pressures on biodiversity, a second round of analysis after the implementation of the incentive measure can be initiated.

Of course, such a second round of analysis would have to allow for sufficient time between the first analysis of the underlying causes and the second round of analysis in order to let the implemented incentive measure take effect. Such a second level analysis is *not* necessary for the purposes of this project. The structure of the framework, however, allows, in principle, to explore how the implementation of the incentive measure has changed the original sources of the pressure on the ecosystem in question. Subsequently, the new and -- hopefully -- reduced impacts could be analysed and a Chapter 5.' could study the implementation of a *new* set of refined incentive measures. While this approach might assume a very ambitious view of policy-making in the short run, it could provide an adequate framework of analysis in the long-run.

The graph below gives an idea of the interaction between the four main modules “Identification of causes and sources of pressures”, “Impacts on ecosystems”, “Impacts on economy and welfare” and “Implementation of incentive(s) and context”.



The analysis of cases in which the identification of damages to ecosystems has lead directly to the implementation of incentive measures without an analysis of module 4 (“Impacts on economy and welfare”) can proceed directly from module 3 to module 5, while maintaining the essential dynamic property of the framework.

4. Discussion of the modules of the framework

In the following, the framework is presented in detail, including comments that highlight which sort of information would be most useful in the preparation of the case studies. This chapter could be used as a reference during the work on the case study. For the success of the project, it will be critical for the individual authors of the case studies to follow the outline as closely as possible, in order to guarantee

comparability. Comparability of the case studies is essential in order to be able to draw generalisable policy conclusions, even if single case studies arrive, due to different contexts and circumstances, to different conclusions. The following remarks can also be read as an introduction to the issues that shall be treated in the respective case studies.

1. *General description*

- Description of the ecosystem
- Description of main impacts
- Identification of incentive measure
- Identification of economic sector(s) targeted by incentive measure

Chapter 1 sets the stage for the case study and should enable the reader to relate the more detailed information provided in later chapters. It should also identify those elements of biodiversity that are the primary objective of the policy action, such as particular indicators or species. Chapter 1 should contain on one page an indication of the most important issues the case study will focus on.

2. *Identification of causes and sources of pressures*

Chapter 2 identifies in progressive steps the reasons for the biodiversity loss or the threats thereof. It proceeds from a description of the most manifest causes of biodiversity loss to a description of underlying policy failures in keeping with the framework developed in *Saving Biological Diversity: Economic Incentives*. An additional step will analyse adverse incentives that promote activities that cause pressure on biodiversity.

2.1 Identification of sectoral activities and resulting pressures through

- pollution
- conversion and land-use
- non-sustainable use of biological diversity, including species trade

The lack of adequate incentives and hence the missing reflection of the value of biological diversity in policy making translates itself through several “channels”. Their identification is the purpose of Chapter 2.1. These channels are examples for unsustainable patterns of consumption and production as described in Chapter 3.2 of *Saving Biological Diversity*. Pollution through industrial, agricultural or touristic activities is an important and well-studied channel of the underlying causes that leads to pressures on biological diversity, especially in areas of intense economic activity. To the extent that sectoral activities and consumption patterns have beneficial effects on biological diversity, such as in certain forms of mountain agriculture, these should also be mentioned.

The most important channel in areas without traditional economic activity, however, is land conversion. This takes the form that land is converted from a use (or non-use) that allows abundant biological diversity but yields no or low private economic benefits to uses that allow only low biological diversity but yield higher economic benefits. Examples are the conversion of natural grasslands or natural forests into land for agriculture, human settlements or industrial forestry. To the extent that land use and conversion are linked to problems of population growth and migration this should also be highlighted.

A third category of transmission channels is constituted by the unsustainable use of biological diversity. Unsustainable use implies that biodiversity resources are used suboptimally. This suboptimality refers to three distinct instances:

- short-term exploitation takes precedence over the maximisation of long-term benefits;
- the exploitation of the target resource (e.g., a certain tropical wood) destroys the surrounding ecosystem;
- the value of the resource is, even in the short-run, insufficiently realised as exploitation proceeds on a first-come, first-serve basis and not on a willingness-to-pay basis which would give rights to the highest value use.

Well-known examples in this category are the over-exploitation of fish stocks, the harvesting of tropical timber and the trade in rare, exotic species. The economic analysis of these processes is analogous to the analysis of rapid rent-dissipation in unmanaged open access regimes (“tragedy of the commons”).¹

Chapter 2.1 can be relatively short, indicatively about one to two pages. While it would be desirable to link it to the underlying conceptual considerations, these considerations have not, in themselves to be repeated in connection with the single case studies.

2.2 Identification of underlying causes of biodiversity loss

- missing markets or non-existent property rights
- information failure
- institutional failure
- enforcement failure
- failure to adequately consider the lifestyles of indigenous and local communities

The driving forces of biodiversity loss can be approached on different levels and can be grouped according to different categories. *Saving Biological Diversity* had chosen in the chapter on “Underlying causes” the three subheadings

- consumption and production patterns
- patterns of population growth and distribution, and
- economic failures.

Global increases in per capita consumption of energy and natural resources in combination with unsustainable systems of agricultural and industrial production, are driving habitat conversion and degradation world-wide. Unsustainable patterns of consumption and production must be addressed through a broad range of policy mechanisms. Population growth and population distribution lead to pressure on land and aquatic resources, especially for food production but also for infrastructure such as roads and housing. Even regional population distribution, such as increased urbanisation and high concentration densities along coastlines and other waterways, can result in destruction of, or damage to terrestrial, aquatic, and marine biodiversity.

These underlying causes of biodiversity loss can be understood in the context of the failures of economic mechanisms. This section examines categories relating to lack of information and institutions that contribute to, or fail to correct for, these underlying causes of biodiversity loss. This allows the consideration of the issues in a perspective that can lead directly to positive policy action correcting those failures and to alleviate the pressures on biological diversity.

¹ The term “tragedy of the commons” should not be confused with any form of communal property management that precisely fulfils the function to prevent the tragedy of uncontrolled overexploitation.

Proceeding from the identification of the channels through which the lack of appropriate incentives translates itself into the loss of or a threat to biological diversity, Chapter 2.2 presents the underlying causes itself. The loss of biological diversity is the result of the lack of appropriate mechanisms to reflect its value. This can relate to the non-realisation of the private use value of biological diversity or of its public good value. Since biological diversity usually embodies private as well as public values, policy failure can, and frequently does, relate to both aspects. Chapter 2.3, however, should as far as possible concentrate on the *underlying failure of economic mechanisms* to adequately reflect the value of biodiversity in private actions.

The private value of biological diversity is equal to the sum of all of its privately appropriable benefits suitably discounted over the long-run. It includes, for instance, the use of biodiversity for ecotourism, as a pool for genetic resources, or for the sustainable exploitation of certain plants, products or animals. The allocation of secure and enforceable property rights is in this case the single most important step. However, in realising the full private value of biological diversity through the allocation of property rights that allows markets to arise two points have to be considered.

First, are the property rights going to the party whose use would yield the highest potential value? Of course, property rights are, in principle, tradable. However, in a complex area such as biological diversity significant transactions costs exist and the initial assignment of property rights might determine the use to a very large degree. Second, lack of information might induce users, as well as policy makers, to pursue, or promote, comparatively low value uses over high value uses.

Biological diversity in all its variety also contains significant option value for private as well as public use. While a private owner with perfect foresight would realise the full private option value, an insufficiently informed owner would not. Considering the current, insufficient, state of knowledge about the processes involved in biological diversity, an argument for ensuring a certain margin of safety, in accordance with the precautionary principle, should be made.

At least in some cases, even the realisation of the full private value of biological diversity will not be sufficient to compete with alternative land-uses such as industrial uses, the planting of agricultural monocrops, or the building of human settlements. Yet nevertheless, there might exist a policy consensus that the conservation and the sustainable use of the ecosystem in question is warranted for reasons of the maintenance of national heritage, as a reservoir for clean air and water or the deriving of pleasure from the pure knowledge of its existence. In those cases, policy will have to realise the *public good value* of biological diversity that can include its private value.

The simplest measure is, of course, to fence off the area and to forbid access. However, subtler measures, and possibly more cost-effective ones, are feasible, in particular, in combination with the realisation of private value. Sustainable private uses can contribute to the maintenance of ecosystems and can thus also realise and even enhance their public goods value. However, such sustainable uses can be privately less profitable than unsustainable uses. In those cases, covering the short-fall through public expenditures can be a possible solution.² An added benefit to such a solution could also be cost savings due to a reduction of monitoring and enforcement costs (see Chapter 5.2).

² While a complex economic and policy topic in itself, agri-environmental payments by the European Union to certain groups of its farmers that are willing to comply with sustainable agricultural practices have partly been developed on the basis of the same conceptual approach.

The task of Chapter 2.2 is to identify as precisely as possible the extent to which the policy failure relates to the non-realisation of the private or the public good value of the ecosystem studied. Chapter 5.1 will discuss the chosen incentive measure chosen to address the policy failure directly. However, the analysis in Chapter 2.2 of the character of the policy failure should be the starting point for the choice of the incentive measure designed to remediate the policy failure. Indicatively, Chapter 2.2 should be of two pages of length.

- 2.3 Identification of adverse incentives, including
- direct and indirect subsidies
 - market price supports
 - tax incentives
 - infrastructure provision

While Chapter 2.2 should identify the *lack* of appropriate policies to conserve or sustainably use biological diversity, Chapter 2.3 should identify those policies that actively *promote* activities that are detrimental to biological diversity. Frequently, both kinds of policy failure exist together, as both are the result of an inadequate reflection of the value of biological diversity in policy making. As a policy action (see Chapter 5.1) adverse incentives do not require an introduction of additional policies but the removal or reform of existing policies.

Adverse incentives are incentives that promote behaviour that reduces biodiversity. They include direct and indirect subsidies, whether as direct transfers, import protection or beneficial tax treatment (“tax incentives”). They also include the provision of infrastructure out of general tax receipts that overproportionally benefit a particular sector with adverse impacts, such as roads that provide access to sensitive ecosystems that would otherwise be more costly to accede.

The analysis of incentives to activities adverse to biological diversity lends itself to a sectoral approach. Adverse incentives are usually provided due to policy objectives other than the conservation or the sustainable use of biological diversity. These objectives are connected to specific sectors, e.g., energy, agriculture, transport, fisheries, of whose activities positive spillovers such as social cohesion, regional development or an improvement of the trade balance are expected.

The adverse incentives can pertain to a macro-level, such as in the case of tax breaks or import protection for an entire industry, or to a micro-level, such as in the case of a specific extension of infrastructure. It is important to identify the original policy objectives connected with the provision of adverse incentives and the resulting distributional consequences (see also Chapter 5.2 on “Process of implementation and distributional effects”). Since Chapter 2.3 is concerned with the identification rather than the discussion of the effects of adverse incentives its length should not exceed one to two pages.

3. *Impacts on ecosystems*

- impacts on genetic and species diversity
- impacts on ecosystem in general
- impact on most important (e.g., keystone, indicator, economic or cultural) species
- impacts on ecosystem resilience
- damage to resource base

Chapter 3 should provide the most pertinent scientific information about the biological, chemical and physical situation in which the case study takes place. In keeping with the approach outlined in *Saving Biological Diversity: Economic Incentives* an ecosystem approach is recommended. Detailed information on genetic and species diversity is, of course, welcome, but should be related to the wider habitat, community or ecosystem. It is important that those aspects that posed the original cause for policy concern are highlighted. Of particular importance are in this context the concepts of “keystone species” and “ecosystem resilience”.

The two related concepts refer to the long-run sustainability of a habitat or ecosystem as a definable ensemble of biological functions. Keystone species are particular species in a particular habitat or ecosystem that assume a critical role for its resistance to adverse pressures, i.e. its resilience. The identification of a particular species, either as an indicator or as a crucial ecological link, allows policy efforts towards conservation and sustainable use to concentrate on single elements of the ecosystem in the choice of incentive measures as well as in the definition of indicators for monitoring and enforcement.

Frequently, also public opinion crystallises around keystone or indicator species, as they become widely recognised symbols of the ecosystems to which they belong. Thus concern about the survival of a particular species is substituted for a less easily communicable concern for the state of an ecosystem. A good example for this process are the discussions in the Pacific Northwest of the United States, where the survival of the spotted owl is dependent on the preservation and the sustainable management of old-growth forests.

The health and sustainability of keystone species can also be one indicator for the resilience of a habitat or ecosystem. The preservation of an ecosystem in a pristine state, free from all human interaction, can be the objective only of a limited number of conservation efforts. In all other instances, the ability of an ecosystem to react and to a certain extent adapt to human interaction is crucial. The importance of the resilience of an ecosystem lies in this ability to adapt while maintaining its distinctive features.

In particular, resilience refers to the ability to maintain the integrity of ecological functions. These ecological functions include those that are *directly* valued by humans, for instance, aesthetic beauty, but also those that are *indirectly* valued through the “services” they render to economic sectors, such as agriculture, forestry, fisheries or tourism by absorbing pollution, providing and maintaining commercially valuable species or by serving as genetic reservoir. Ecosystem resilience is thus closely related, but not identical to the maintenance of the species contained in it. At least over a limited time-period, the variety of species could, in principle, be maintained, while ecological functions and resilience are already damaged.

Since Chapter 3 is providing a host of biological, chemical and physical information, its length should, indicatively, be three to five pages.

4. Impacts on economy and welfare
 - direct economic losses
 - economic valuation of damages to public goods (if applicable)
 - effects of adverse incentives on budget, efficiency and employment
 - beneficiaries of inaction and bearers of costs prior to implementation

Activities that cause damages to biological diversity and ecosystems have direct and indirect impacts on human welfare. These impacts can be differentiated in three categories - direct economic impacts, damages to public goods connected with biodiversity and economic impacts of adverse incentives. First, there are those impacts that directly affect economic activities. This can include the valuation of “traditional” economically valuable resources such as, for instance, minerals, timber or fresh water. It also includes reductions to the value of activities that sustainably use biodiversity, such as ecotourism. These damages translate into private losses for individuals working in the sectors concerned. This first category of economic impacts also includes damages to potential benefits from the utilisation of genetic resources.

Second, there are impacts on public goods connected with biodiversity, such as existence and option values for distinct species or ecosystems, i.e., the appreciation for their beauty and their being part of nature. While a series of methods for the monetary evaluation of these public good values are available, the ecosystem approach to biological diversity suggests caution in the interpretation of the derived values: the monetary expression of the value of single elements of biological diversity necessarily implies the isolated consideration of these elements. One value of biological diversity lies in the interconnection of a multitude of biological elements and functions and in the complexity this generates. Thus in the case of biological diversity, the monetary expression of any of its elements will only capture a fraction of its value as part of a larger ensemble.

Economic valuation can be highly valuable for the focusing of public opinion as well as for the guidance of policy by helping to integrate biodiversity concerns into economic decision-making. It can be an incentive measure on its own by correcting for information failures or it can provide valuable input for the development of incentive measures. However, while helpful in certain policy contexts, the monetary valuation of damages to biodiversity is not required for the implementation of incentive measures.

Third, the economic pressures and adverse incentives discussed in Chapter 2.3 can have adverse impacts not only on biological diversity. The abolition of subsidies, for instance would reduce the burden on government budgets and, *a priori*, increase economic efficiency. Thus, in principle, their removal can bring beneficial economic as well as ecological benefits. Of course, the cost of subsidy removal comes in terms of those alternative policy objectives that were originally pursued with the help of subsidies.

The individual case studies on the implementation of incentive measures for the conservation and the sustainable use of biological diversity are not the place to engage in an extended analysis of the general arguments against the provision of government support for single industries. It is necessary though that *all* impacts of government actions, including adverse impacts on biodiversity, costs to tax payers, economic efficiencies and employment considerations receive adequate attention.

The costs to government budgets of the support to sectors or activities with negative impacts on biodiversity should be clearly stated. The employment results *with* the adverse incentive in place should also be briefly contrasted with the employment effects of a sustainable use of the biodiversity resource in question, in the absence of adverse incentives. Employment created by the sustainable use of biodiversity has the added advantage of being able to provide employment for indigenous populations, whose knowledge and practices could thereby be profitably maintained.

In addition to those three categories of economic damages, those groups that carry the main burden of these costs, as well as those groups that benefit from the situation *without* incentive measures to conserve and sustainably biodiversity should be clearly identified. Chapter 4 should comprise about two to three pages.

5. *Implementation of incentive measure(s) and context*

Chapter 5 is concerned with the incentive measure chosen in each case study and its implementation process. Chapter 3 has analysed the situation that requires the implementation of incentive measures. Chapter 4 has brought together any related information on economic impacts. Chapter 5 draws together the information about the actual measure designed to remediate that situation. Particular emphasis is paid in this context to issues of stakeholder involvement, distribution, institutional development, the social and cultural context and the generation and dissemination of information.

5.1 Identification of actual or planned incentive measure

- category of measure (regulation, market incentive, property rights definition etc.)
- objective of incentive measure
- reason for choosing measure

Incentive measures for the conservation and the sustainable use of biological diversity are means to induce individual agents to include the full private and public value of biological diversity in their economic decisions. Chapter 5.1 should identify and describe the proposed or implemented incentive measure of each case study. Of particular interest are those incentives that rely on private behaviour in markets for a transmission of this value. As a basis for identification could be employed the table on page nine of *Saving Biological Diversity: Economic Incentives*. The table distinguishes between positive incentives, disincentives, indirect incentives and the removal of perverse incentives (see Appendix 1).

A different set of categories could be constituted by: first, measures that realise the private use value of biodiversity through the creation of property rights and markets; second, measures that realise the value of biological diversity as a public good through instruments such as environmental taxes, standards, a transferable quota systems or the creation of a protected area; and third, the reduction of uncertainty and an increase in information in order to avoid unsustainable short-term exploitation of resources. The measures should correspond to the analysis of the policy failure in Chapter 2.2 that was at the bottom of the pressure on biological diversity.

Related to these points Chapter 5.1 should also briefly discuss the precise objective of the measure as part of the overall aim to conserve and sustainably use biodiversity, as well as the actual reason it was ultimately selected for. In a real world context, the two might differ. In discussing the reasons for choosing the measure also any methods of analysis, in particular economic analysis, that might have been employed by

the policy-implementing decision-maker should be referred to. This might include cost-benefit analysis, including the economic value of biodiversity, input-output analysis, scenario analysis or others.

Chapter 5.1 should, nevertheless, not be longer than one to two pages, since much of the background has already been prepared in Chapters 2.1-2.3.

5.2 Process of implementation and distributional effects

- beneficiaries of incentive measure and bearers of cost after implementation
- participation and negotiation
- enforcement and compliance

Chapter 5.2 would contain a short description of the actual *process* of implementation. It would draw together the single elements and describe how they lead up to the implementation of the incentive measure over time. In this subchapter particular attention should be paid to the time dimension. The implementation of an incentive measure ranges from the first identification of adverse pressures on biological diversity over the analysis of underlying causes, over the build up of policy support for remedial action, over the selection of an appropriate incentive measure and over its legal implementation to, in last instance, its enforcement. Chapter 5.2 should trace this evolution.

Incentive measures that support the conservation and sustainable use of biological diversity by realising its true private and public value contribute to the maximisation of total societal welfare. However, this does not mean that *everybody* profits from the implementation of an incentive measure. It just implies that the benefits from an appropriately chosen and implemented incentive measure outweigh its costs. In principle, this would imply that the winners from the implementation of an incentive measure could compensate the losers, whose welfare would stay constant, while increasing their own (and total) welfare.

Ideally, such compensation would take place and there would be *only* winners from the implementation of an incentive measure. In practice however, such compensation does not always take place. There will thus be winners and losers from the implementation of an incentive measure, as there were winners and losers from the absence of incentive measures. Thus even when the implementation of an incentive measure remedies an inefficient situation, and hence increases total welfare, there are potentially groups that will lose, since they profited in the past from unsustainable use (see Chapter 4.).

This has impacts on the feasibility of the incentive measure. To the extent that biological diversity is a public good the number of people that benefit from its protection will be a large, while the benefit itself will be relatively small for each person. On the contrary, the beneficiaries from unsustainable short-term use in the absence of appropriate incentive measures might be few in number but their individual benefits might be relatively high. Although total benefits from protection will outweigh the costs due to the high number of beneficiaries, it is frequently taken for a fact that the interests of small, well-organised interest groups with individually large stakes will have an easier time to be heard and to influence policy than the interests of large groups with individually small stakes. Similar effects can arise in conflicts between long-term and short-term interests.

The maximisation of total welfare through the appropriate consideration of biodiversity concerns indicates *a priori* little about the fact whether the distributional impacts of incentive measures for the conservation and the sustainable use of biological diversity are desirable or not. However, incentive measures that promote the wider application of practices relevant for the sustainable use of biodiversity through indigenous and local communities, and that would presumably make the latter “the winners” of such

an incentive measure, do receive additional support from Article 8(j) of the Convention on Biological Diversity. Of course, all distributional issues take place in the context of Article 3 of the Convention that states the sovereign right of states over their resources.

The solution of distributional questions directly relates to questions of stakeholder participation in the implementation process and any negotiations that have preceded or accompanied it. Relevant questions in this context are: have groups concerned either by the environmental impacts or the implementation of the incentive measure been consulted in advance? Did these groups have a possibility to voice their concerns during the process? And finally, how does the process of implementation relate to other regional, national, or international initiatives.

Particular emphasis should, finally, be on those aspects that become relevant *after* the legal enactment and institutionalisation of an incentive measure. Thus questions of compliance and, if applicable, enforcement should be discussed. Compliance and enforcement are closely linked to the question of the distributional impacts of the incentive measure and how they further or hinder the process of implementation. Compensation schemes for losers, for instance, might increase the feasibility of incentive measures by reducing monitoring and the enforcement costs. A complete analysis of the costs of the measure will thus have to firmly link efficiency and distributional considerations. The length of Chapter 5.2 could vary between two and three pages.

- 5.3 The role of information and uncertainty in the implementation process
- information about biodiversity value and environmental impacts
 - information about economic impacts
 - technical information
 - cultural (indigenous) knowledge

Information, its generation and distribution, or the lack of it, permeates every aspect of biodiversity policies. The lack of information about the value of biodiversity does not allow its adequate conservation, or fails to make its use sustainable. Lack of information is equivalent to uncertainty about the trade-offs between the benefits of biological diversity and the economic activities that diminish these benefits. The role of information is also directly linked to the cultural and social context. Attitudes and perceptions are shaped by different sets of information. The provision and dissemination of information about the different private and public values of biological diversity have a direct impact on the cultural patterns and are part of the successful implementation of incentive measures.

The provision of information about the value of biological diversity can in itself constitute an incentive measure. To the extent that the loss of biological diversity is perceived as a loss of welfare comparable to the costs and benefits of economic activities, the value of biodiversity can be integrated through market-based instruments into economic decision making. However, care has to be taken in the choice of incentive measures as information can be asymmetric. In such cases, the distributional impact of the incentive measure can have additional (and frequently unforeseen) incentive effects on the provision and availability of information in the first place (see Chapter 5.2).

A good example of asymmetric information and the impact it has on the choice of incentive mechanisms is constituted by the “first mover problem”: if a landowner finds a commercially useless species that is threatened by extinction on his property, his economically rational action would be to hide its existence, if the incentive mechanism to conserve biodiversity is constituted by a regulation that restricts commercially attractive activities. His action might be different, if the incentive mechanism is constituted by

a different regulation that imposes restrictions only in combination with, for instance, a property tax rebate for land with a high biodiversity value, reflecting the public interest. It would be helpful, if case study authors could identify similar problems in the course of the experience described and outline any means that have been chosen to deal with them.

Another particular aspect of information in the sphere of biological diversity consists in the importance of the “knowledge, innovations, and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and the sustainable use of biodiversity” and the protection accorded to them under the Convention on Biological Diversity. Such traditional knowledge can also offer useful guidance towards methods of resource management and conservation (e.g., frequency of prescribed fires for weed control). To some extent this special kind of information is part of biodiversity itself and thus becomes an objective, as well as an instrument, of conservation and sustainable use.

Last not least, the question how the available scientific information relating to physical, chemical and biological facts has been treated in the design, implementation and the evaluation of an incentive measure is an important element of the case study. Indicators such as “number of species”, for instance, can constitute a basis for determining a need for action or in establishing the success or failure of an incentive measure. In this context not the information itself (which should have been contained in Chapter 2) is relevant, but its strategic use in implementing the incentive measures.

Chapter 5.3 should thus also refer to the state of (scientific) knowledge on the basis of which the decision to implement an economic incentive measure has been made. It should also, if applicable, indicate research efforts that accompanied the implementation of the incentive measure. Its total length should be around two pages.

5.4 Framework and context of implementation

- explicit legal framework, property and use rights (formal constraints)
- cultural, historical and social context (social constraints)
- institutions concerned (including appropriate government level)
- internal evaluation and remedial process

As highlighted in Chapter 2.2 unsustainable pressures on biological result from policy failures. These policy omissions, while leading to suboptimal situations, are part of an established legal and institutional framework. The introduction of incentive measures is thus about legal and institutional change. In some cases, the institutional framework is well laid out to accommodate new and changed circumstances, in other cases this might not be the case. Implementation will then require additional transaction costs in terms of changing institutions or setting up new ones. The task of Chapter 5.4 is to highlight the different legal, institutional and cultural processes that are taking place in the implementation on an incentive measure.

The formal institutional and legal framework conditions should be treated briefly, but precisely. The main decision makers in the implementation of the incentive measure, and, if applicable, the processes involved in any appeal against this implementation should be indicated. Also those institutions or actors concerned with monitoring and enforcement should be briefly introduced. Of course, any new institutions created in the process of implementation need also to be mentioned.

Of great importance for the successful implementation of incentive measures are so-called social constraints, or the cultural, historical and social context. They are particularly relevant since the conservation and the sustainable use of biological diversity involves the transfer of a frequently only vaguely perceived “public” good from an informal domain of costless access and use into a more structured sphere where single elements of biological diversity are “valorised” in different dimensions such as genetic resource value, recreational value, option and existence values and so forth. If this transfer is to be successful, long-standing perceptions and behavioural patterns of the relevant actors have either to be positively reinforced by the incentive measure or to change, sometimes radically so.

The success of the implementation of an incentive measure will frequently depend on the degree to which the implementation process manages to integrate the social and cultural context. It is important that the incentive measure implemented works in a fashion that is complementary rather than contradictory to the existing cultural context. It should work within this context, wherever compatible with the conservation and the sustainable use of biodiversity. The basis for such compatibility is the diligent study of the context, mutual consultation and information, and, in last instance, adaptation of the incentive measure.

Finally, the question should be answered, whether an internal evaluation (as opposed to an external evaluation such as the present OECD effort) of the success of the incentive measure exists. Last not least, it would be of interest if the implementation process foresees any mechanism to re-adjust the incentive measure after first experiences. Preliminary evidence suggests that only measures designed for at least a medium time horizon would have any beneficial impacts on the conservation and the sustainable use of biological diversity. This would make the existence (or non-existence) of such review mechanisms an interesting point to discuss. Due to its importance, Chapter 5.4 can be of up to three pages of length.

6. *Policy relevant conclusions*

Chapter 6 will contain those elements that will most directly feed into the handbook for policy guidance on the implementation of incentive measures. In fact, it should provide, from the perspective of individual authors, a short interpretation of the results of the preceding three chapters with respect to their relevance for general policy conclusions.

6.1 Lessons learned

Chapter 6.1 should contain a first synthesis of the case study with regard to the projected or actual effectiveness of the incentive measure implemented and the determinants of its success, or failure. Despite its importance, this synthesis can be short and highlight on one page only the most important lessons learned.

6.2 Transferability of the experience

As a second step, a short comment should be provided on the extent to which the case study could be considered representative. The particularities of the case study should be evaluated whether they constitute fundamental barriers to the transferability of the results to other instances. Of course, each case will have its unique characteristics. However in some cases, these characteristics may not regard the fundamental working of the incentive measures. In other cases, the particularities will be such that the incentive measure under consideration will not display the same characteristics in other situations.

Minimum requirements concerning the transferability of the experience, such as minimum institutional requirements, minimum biotic or ecological requirements and market requirements should also be mentioned. The length of this discussion should not exceed one page.

6.3 Possible policy advice for implementation

Chapter 6.3 should contain a first indication by the authors of the individual case studies which general policy conclusions could be drawn from their case study. Of course, this indication can not substitute for the work of the OECD Expert Group to formulate general policy conclusions. However, it might prepare it and provide additional view points of view. In addition, the single greatest barrier and the single greatest positive influence towards success of the implementation of the incentive measure should be identified. Again, these elements for possible policy conclusion should be delivered on one page or less.

Total length of the case study

The total length of a typical case study would vary between 18 and 25 pages, as a result of summing up the individual indicative chapter lengths. However, the chapter lengths were provided as a rough guide for *relative* weights. There is thus some added flexibility for individual researchers to determine the total length of their report.

5. Outreach, extension and co-operation

After their completion, the case studies will be collected by the Secretariat for comparison and synthesis. The comparison will not confine itself to a statistical analysis of the different elements, but rather focus on the identification and analysis of the most salient issues in the implementation of incentive measures to alleviate pressures on biological diversity. In a next step, the most successful solutions and the lessons learned will be integrated in order to develop practical policy recommendations. Despite the grouping of the individual case studies under ecosystems, the synthesis of a subset of case studies treating one particular sector will also be included.

The results of this work will be synthesised in a handbook for policymakers on how to proceed with the implementation of incentive measures, and, in particular, market-based instruments. The handbook will contain pragmatic policy guidance designed for the use in OECD Member countries, based on observed best-practice. The elaboration of the handbook will be completed by the Secretariat, possibly with the help of a consultant, under the oversight of the Expert Group on the Economic Aspects of Biodiversity.

On the basis of the case studies and building on the analytical insights developed in *Saving Biological Diversity: Economic Incentives*, the handbook will contain the following elements:

- an overview of the incentive measures, used by OECD Member countries;
- a sector-by sector overview of adverse incentives that are exerting pressure on biological diversity;
- an indication of the critical issues that influence success and failure of an incentive measure
- the check-list of conditions that have to be fulfilled for successful implementation;
- a presentation of policy options that have been identified by the Expert Group as the most efficient solutions towards the conservation and the sustainable use of biodiversity resources.

The handbook would be comparable to the 1991 OECD publication *Environmental policy: how to apply economic instruments* that contains guidelines on the general use of economic instruments derived from the work of the OECD Task Force on Economic Instruments and the review of member countries experiences.

The results of the handbook will be oriented towards the policy needs of OECD Member countries. However, it is likely that the experiences of the OECD Member countries and the thereof derived policy guidance for the implementation of incentive measures will provide insights for policymakers beyond the OECD. At the same time experiences with incentive measures in non-OECD countries might add new considerations to be taken into account.

There are several possibilities to extend the work of the OECD Expert Group on the Economic Aspects of Biodiversity, once completed. The UNESCO Man and the Biosphere (MaB) Programme is considering using a similar framework for the analysis of experiences with incentive measures. The Secretariat of the Convention on Biological Diversity is preparing a report on incentive measures for the next Conference of the Parties. UNCTAD is compiling developing countries' experiences with incentive measures in the framework of the implementation of the first phase of its Biotrade Initiative. UNEP is considering a capacity-building programme in the field of incentive measures to be financed by the Global Environment Facility. While the OECD work is highly recognised in all these instances, the work of the Expert Group, and the resulting handbook, will first and foremost aim at providing policy guidance for the conservation and the sustainable use of biodiversity in OECD Member countries.

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APPENDIX I

**Table for the Classification of Incentive Measures
from *Saving Biological Diversity: Economic Incentives***

Positive Incentives	Disincentives	Indirect Incentives	Removal of Perverse Incentives
<ul style="list-style-type: none"> • agricultural land set-aside schemes • public or grant-aided land purchase • wetland reserves • covenants/conservation easements • cost-sharing/management agreements • species enhancement schemes • customary cultivation of biodiversity • international biodiversity transfers • incentive payments for organic farming • taxation and fiscal measures 	<ul style="list-style-type: none"> • user fees • non-compliance fees • fines for damages • environmental liability • performance bonds • habitat mitigation schemes • marine pollution liability 	<ul style="list-style-type: none"> • individual transfer-able fishing quotas • tradeable development rights • property-right mechanisms • species commercialisation • biodiversity prospecting deals • forestry offsets • air emission trading • effluent discharge trading • tradeable water entitlements • wetlands mitigation banking • joint implementation • debt-for-nature swaps • international franchise agreements • eco-labelling 	<ul style="list-style-type: none"> • reduction and restructuring of agricultural support harmful to biodiversity • introduction of agricultural conservation compliance measures • reform of public forestry concession pricing, licence fees, reforestation fees, and royalties • full appraisal of forest benefits • discontinuation of below-cost timber sales • reform of tax structures • full cost pricing for water services • appraisal of biodiversity impacts in the transport sector • road pricing • costing of biodiversity loss in energy investment appraisal