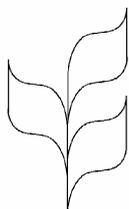




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**WORKSHOPS ON SUSTAINABLE USE
OF BIOLOGICAL DIVERSITY**

Fourth workshop
Addis Ababa, Ethiopia
6-8 May 2003
ITEM 7

The sustainable use of biological diversity within the framework of the ecosystem approach

Note by the Executive Secretary

1. The Secretariat is hereby circulating the attached IUCN document prepared for the fifth meeting of the Subsidiary Body on Scientific Technical and Technological Advice entitled “Sustainable use within an ecosystem approach”, in light of its relevance for the meeting. The attached document illustrates the correlations between the ecosystem approach and sustainable use principles, and exemplifies the process experts may wish to adopt to develop principles and guidelines for the sustainable use of biological resources.

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Sustainable Use within an Ecosystem Approach

Submitted for information

to

5th meeting of the

Subsidiary Body for Scientific, Technical and Technological Advice

to the

Convention on Biological Diversity

Prepared under the auspices of IUCN – Sustainable Use Initiative



1. Background

1. This document has been prepared by the IUCN/SSC Sustainable Use Specialist Group (SUSG) for multiple purposes, one of which is to assist the Parties to the Convention on Biological Diversity (CBD) in their efforts to identify principles for sustainable use. Although the definition of sustainable use under the Convention applies to all components of biodiversity including domesticated forms, the emphasis of this information paper is focused on wild species. The paper is being submitted as an Information Document to assist the delegates attending SBSTTA-5.
2. SBSTTA-4 examined a working document “*Development of Approaches and Practices for the Sustainable Use of Biological Resources, Including Tourism,*” and concluded:

UNDERSTANDING that linkages between tourism and sustainable use of biological diversity will be examined by the Executive Secretary in order to elucidate any principles, approaches or methodologies that may apply to a wider consideration of sustainable use, in the fifth meeting of SBSTTA and that in further preparing for this meeting contact will be initiated with other groups involved in sustainable use, such as the Sustainable Use Initiative.
3. In addition to the treatment of sustainable use in the development of thematic work programmes on dryland ecosystems and inland water systems, the provisional agenda for SBSTTA-5 will specifically address sustainable use under the following items:
 - a. 3.1: Cooperation with other bodies [3.5.3. Forest biological diversity: status and trends and identification of options for conservation and sustainable use].
 - b. 4.2: Cross-cutting issues [4.2.3 Sustainable use of the components of biological diversity: identification of sectoral activities that could adopt biodiversity-friendly practices and technologies].
4. The CBD has begun development of an Ecosystem Approach for the implementation of the Convention. The document UNEP/CBD/COP/4/Inf.9 titled “***Report of the Workshop on the Ecosystem Approach***” held in Malawi (January 1998) was presented at COP-4 (Bratislava; May 1998). The Parties took note of the report and requested the SBSTTA to develop principles and other guidance on the ecosystem approach, taking into consideration, *inter alia*, the results of the Malawi workshop, and to report thereon to COP-5 (Decision of the Parties IV/1/B).
5. The CBD has begun the development of indicators for monitoring biological diversity and the subject was discussed at the SBSTTA-3. In considering the report of SBSTTA-3 on this subject, COP-4 decided (Decisions IV/1/A/3 & 4) that work on indicators should be continued by the SBSTTA and proposed that “*further work on indicators by the Parties and by SBSTTA should take account of, inter alia, further work by SBSTTA on the development of the ecosystem approach*”.
6. The need for indicators to monitor the status of biological diversity is recognized. Whilst this paper provides guidance on principles of sustainable use, it may also assist the SBSTTA in its work on identifying and elaborating such indicators.

7. Given the closely related nature of the principles of the ecosystems approach, as presented in document UNEP/CBD/COP/4/Inf.9, and the principles of sustainable use, they are presented together to illustrate their congruence. Indeed the linkages between sustainable use and the ecosystem approach, as being developed, can be translated into the close relationship between sustainable use and the other two objectives that underpin the CBD (i.e., conservation and equitable sharing of benefits).

2. Introduction

8. The three objectives of the CBD are:
- the conservation of biological diversity,
 - the sustainable use of its components, and
 - the fair and equitable sharing of benefits arising out of the use of genetic resources (Article 1).
9. The CBD Secretariat has carried out a preliminary identification of the proximate threats to, and the ultimate causes of, the loss of biological diversity (Document UNEP/CBD/SBSTTA/2/3). These are summarized as follows:

<p>PROXIMATE THREATS:</p> <p>Over-harvest or over-kill of wild species</p> <p>Introduced species</p> <p>Habitat destruction or deterioration</p> <p>Pollution</p> <p>Climate change</p>
<p>ULTIMATE CAUSES:</p> <p>Inappropriate land tenure</p> <p>Population change</p> <p>Cost-benefit imbalances</p> <p>Cultural factors</p> <p>Misdirected economic factors</p> <p>National policy failure</p>

10. When using wild species, people should seek to maintain the structure and functions of natural ecosystems. Achieving sustainability involves an ongoing process of improved management of the resource. Management should be adaptive, incorporating monitoring and the ability to modify management to take account of risk and uncertainty.
11. Unsustainable use through “over-harvest or overkill of wild species” has been identified as one of the proximate threats to biological diversity, but is likely to vary according to the species concerned and may not necessarily represent the greatest threat. In terrestrial ecosystems, habitat destruction and the effects of introduced species may be more significant and, in aquatic systems, pollution is a serious threat to biological diversity.

12. The CBD has noted that “... *consumptive use of wild species could be a contribution to conservation.*” (UNEP/CBD/COP/3/3 dealing with the Report and Recommendations of SBSTTA-2). Whereas use has often been thought of as having a neutral or negative influence on the conservation of wild living resources, there is now a growing body of evidence, as reflected in the three inter-related objectives of the CBD, to indicate that legal and responsible use can also enhance conservation under certain circumstances.
13. Sustainability should not be seen as a fixed end-point to be reached, but rather as a direction to guide constructive change. The fact that a use may have been sustainable in the past or may be sustainable now is no guarantee that it will remain sustainable in the future. Equally, unsustainable uses may be changed to sustainable uses through a focus on tenure, incentives and adaptive management.
14. The word “sustainable” implies a condition rather than being a variable. Sustainability needs to be expressed in probabilistic terms (*i.e.* the likelihood of a use being sustainable) in order to carry out scientific analyses.
15. Whether a use has been sustainable must be judged in hindsight by examining whether the status of the resource and the ecosystem in which it occurs have remained within certain specified limits. The likelihood that a use will be sustainable into the future requires consideration of social and economic factors in addition to ecological factors.
16. At the ecosystem level, the aim of sustainable use is to maintain the biological diversity. This provides a powerful linkage to the first objective of the CBD which is the conservation of biological diversity. As recognized in Principle 5 of the Ecosystem Approach, the concept of biological diversity must include ecosystem functions, processes and resilience.
17. Any pronouncement on sustainability at the ecosystem level will require the development of indicators for measuring biological diversity that are to be considered by SBSTTA-5 (Agenda Item 4.2.2). At the level of the ecosystem these indicators should ideally assess trends in biological diversity and the sustainability of uses. These will differ for each thematic area (*e.g.* inland water ecosystems, marine and coastal ecosystems, agricultural ecosystems, forest ecosystems, and dryland, Mediterranean, arid, semi-arid, grasslands and savannahs), and possibly within these broad ecosystem types.

3. Definitions

18. The following definitions from Article 2 of the Convention on Biological Diversity underpin the principles outlined in this document —
 - a. **Biological Diversity:**

The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
 - b. **Ecosystem**

A complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

c. Sustainable Use:

The use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

4. Criterion for Sustainability

19. Consideration of sustainability should not be based on assumptions that ecosystems are stable, nor on expectations that there will always be a productive annual renewal of whatever has been taken from a wild population. In semi-arid and arid ecosystems, for example, environmental extremes may result in extreme annual variations in rates of renewal by wild populations. The following simple criterion for sustainability has applicability at both the species and ecosystem level.

Provided biological diversity and key ecological functions are maintained, and the population of any target species remains above thresholds for long-term viability and at levels where it remains a significant resource for people, then the use can be regarded as generally sustainable.

5. Factors Influencing Sustainability

20. In order to increase the likelihood that any use of a wild species will be sustainable requires consideration of the following:
- The supply of biological products and ecological services available for use is limited by intrinsic biological characteristics of both species and ecosystems, including productivity, resilience, and stability, which themselves are subject to extrinsic environmental change.
 - Institutional structures of management and control require both positive incentives and negative sanctions, good governance, and implementation at an appropriate scale. Such structures should include participation of relevant stake-holders and take account of land tenure, access rights, regulatory systems, traditional knowledge, and customary law.
 - Wild species have many cultural, ethical, ecological and economic values which can provide incentives for conservation. Where an economic value can be attached to a wild species, perverse incentives removed, and costs and benefits internalized, favourable conditions can be created for investment in the conservation and the sustainable use of the resource, thus reducing the risk of resource degradation, depletion, and habitat conversion.
 - Levels and fluctuations of demand for wild species are affected by a complex array of social, demographic, and economic factors, and are likely to increase in coming years. Thus attention to both demand and supply is necessary to promote sustainability of uses.

6. Principles

21. The principles of the ecosystem approach presented in CBD document UNEP/CBD/COP/4/Inf.9 and the principles of sustainable use being developed by the IUCN/SSC Sustainable Use Specialist Group are similar and are compared below.

PRINCIPLES OF AN ECOSYSTEM APPROACH

SUSTAINABLE USE PRINCIPLES

INTRODUCTORY PARAGRAPHS

- A** As they are all complementary and interlinked, the principles below need to be read in conjunction with each other. Together they characterize the ecosystem approach.
- B** All involved in implementing the ecosystem approach should remain accountable to their constituencies for the consequences of management actions. The ecosystem approach should include a system of accountability that addresses performance of managers and decision-makers, and achievement of management objectives. Management actions should strive for efficiency, effectiveness and equity. They should be taken with precaution.

In any given situation, a multitude of configurations of biological, social, and economic conditions can lead to sustainability of use.

Sustainability relies on favourable combinations of political, social, cultural, economic, and ecological factors and incentive systems which harness positive human motivations. Accountability should be realized through the formation of appropriate institutions. Different modes of use may require different institutional structures (*e.g.*, harvesting marine fisheries may require regulation, whereas harvesting another resource may depend on market forces). All uses should be managed to reduce the risk of compromising key functions at the ecosystem level and promote sustainability.

PRINCIPLES

- 1. Management objectives are a matter of societal choice.**

Rationale: Different sectors of society view ecosystems in terms of their own economic, cultural and social needs. Ultimately, all ecosystems are managed for the benefit of humans – whether that benefit is consumptive or non-consumptive.

- 2. Management should be decentralized to the lowest appropriate level.**

The objective of sustainable use is, through the derivation of benefits, to improve human welfare by conserving biological diversity and maintaining ecosystem productivity.

Rationale: Uses of natural resources are fundamental to the economy, culture and well-being of all people and all nations. Accordingly, public involvement is essential in the development of sustainable use regimes, including management options and policy.

Rights of access to resources and responsibilities for their management are important factors affecting sustainability.

Use is most likely to be sustainable where the prime beneficiaries are the people living with and using the resource.

PRINCIPLES OF AN ECOSYSTEM APPROACH

Rationale: Decentralized systems can lead to greater efficiency, effectiveness and equity. The closer the management is to the ecosystem, the greater is the responsibility, accountability, participation, and use of local knowledge.

3. Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.

Rationale: Management interventions in ecosystems often have unknown or unpredictable effects on other ecosystems and therefore need careful consideration and analysis. This may require institutions for decision-making which lead to appropriate compromises and trade-offs.

4. Recognizing potential gains from management there is a need to understand the ecosystem in an economic context. Any ecosystem management program should:

(a) reduce those market distortions that adversely affect biological diversity;

(b) align incentives to promote sustainable use; and

(b) (c) Internalize costs and benefits in the given ecosystem to the extent feasible.

Rationale: The greatest threat to biological diversity lies in its replacement by alternate systems of land use. This often arises through market distortions which undervalue natural systems and populations and provide perverse incentives and subsidies to favour the conversion of land to less diverse systems.

SUSTAINABLE USE PRINCIPLES

Rationale: Rights of access may be vested in the State, the community, a private body or the individual. For use to be sustainable, such rights need to be clearly defined and accepted by the people they affect directly. Furthermore, the capacity to enforce those rights must also exist.

To achieve sustainable use of certain wild resources over increasing geographic scales will require the development of multiple institutions.

Rationale: To prevent use regimes in one ecosystem from having negative impacts on other ecosystems, it will be necessary to develop a 'bottom-up' hierarchy of institutions to address the management of various resources at the appropriate geographic scale (see Principle 7).

Sustainable use of wild living resources requires the effective structuring and functioning of economic incentives.

The three points (a-c) noted in the left column apply directly to sustainable use. Sustainability is more likely when:

(a) economic activities are closely linked to resource tenure systems;

(b) incentives are aligned to favour re-investment of returns from use in ecosystem conservation; and

(c) market interventions arising from externally imposed conservation concerns take full account of the socio-economic implications of their application.

Rationale: The greater the economic significance of a resource, the greater the need to establish strong institutions for its management and use. Conversely, local people are seldom motivated to develop strong, flexible and innovative institutions for wild living resources of no economic value or an economic value that has not been recognized.

PRINCIPLES OF AN ECOSYSTEM APPROACH

Often those who benefit from conservation do not pay the costs associated with conservation and, similarly, those who generate environmental costs (e.g., pollution) escape responsibility. Alignment of incentives allows those who control the resource to benefit and ensures that those who generate environmental costs will pay

5. A key feature of the ecosystem approach includes conservation of ecosystem structure and functioning.

Rationale: Ecosystem functioning and resilience depends on a dynamic relationship within species, among species and between species and their abiotic environment as well as physical and chemical interactions within the environment. The conservation of these interactions and processes is of greater significance for the long-term maintenance of biological diversity than simple protection of species.

6. Ecosystems must be managed within the limits to their functioning.

Rationale: In considering the likelihood or ease of attaining the management objectives, attention must be given to the environmental conditions which limit natural productivity, ecosystem structure and functioning. The limits to ecosystem functioning may be affected to different degrees by temporary, unpredictable or artificially maintained conditions and, accordingly, management should be appropriately cautious.

SUSTAINABLE USE PRINCIPLES

All ecosystem conservation entails overhead costs — including opportunity costs. The more returns from sustainable use can offset these costs, the higher the likelihood of sustainability. Well-regulated markets with strong links to producers, provide incentives for re-investment in ecosystem conservation.

Sustainability is more likely when the benefits from using wild living resources in an ecosystem are greater than the costs of conserving that ecosystem and provide higher returns, in the long-term, than alternative uses of that ecosystem. Accordingly, economic instruments such as sanctions, subsidies, multi-lateral agreements and international treaties should not inadvertently act against sound economic practices that promote the sustainability of use of wild resources.

Sustainable use should be implemented at the ecosystem level since it is the maintenance of key ecosystem processes and functions which ultimately determine sustainability.

Rationale: A use may be regarded as sustainable at the ecosystem level when biological diversity and key ecological functions are maintained. Recognizing this, sustainable use of a population of a species can enhance the conservation of those populations.

Sustainability should be assessed in terms of ecological effects at the ecosystem level.

Rationale: Social, economic and ecological factors determine whether a use will be sustainable, but any use must remain within the limits of ecosystem functioning. In determining whether a use has been sustainable, the sole indicator is the status of the ecosystem. The relationship between levels of exploitation and ecosystem functioning can generally be advanced through adaptive management.

**PRINCIPLES OF AN ECOSYSTEM
APPROACH**

- 7. The ecosystem approach should be undertaken at the appropriate scale..**

Rationale: The approach should be bounded by spatial and temporal scales that are appropriate to the objectives. Boundaries for management will be defined operationally by users, managers, and scientists. The ecosystem approach is based upon the hierarchical nature of biological diversity characterized by the interaction and integration of genes, species and ecosystems

- 8. Recognizing the varying temporal scales and lag effects which characterize ecosystem processes, objectives for ecosystem management should be set for the long term.**

Rationale: Ecosystem processes are characterized by varying temporal scales and lag effects. This inherently conflicts with the tendency of humans to favour short term gains and immediate benefits over future ones.

- 9. Management must recognize that change is inevitable.**

SUSTAINABLE USE PRINCIPLES

The achievement of sustainable use requires monitoring of biological diversity and ecosystem functioning at a range of scales.

Without losing the integrity of data, biophysical information derived from research undertaken at the local level needs to be scaled-up to the levels that are useful to policy-makers.

Rationale: Recognizing the continuum of genes, species, and ecosystems which characterize the ecosystem approach, and the interactive requirements of Principles 3, 5 and 6, the variables to be monitored for sustainability need to be selected on a case-specific basis related to their roles in the functioning of the ecosystem involved.

The synthesis of information is more than the simple aggregation of small-scale data into a broad scale that is useful for policy makers. The utility of local research will be realized by clearly defining policy needs and achieving dialogue between policy-makers and researchers. For example, the annual loss of organic matter in soils at the field level may be a problem for a soil scientist, but is rather abstruse for a policy-maker who is more interested in assessing immediate opportunity costs against economic or social benefits at a regional or national level. Therefore, the perception of a problem, and the consequent utility of indicators, may change substantially, according to the perspective of the users at different hierarchical levels.

Management for sustainable use should be based on the recognition that ecosystems are dynamic rather than stable.

Rationale: In many ecosystems large episodic environmental fluctuations may play a greater role in determining species population levels and ecosystem status than any use regime. Accordingly, sustainability concepts need to accept that uses may need to be opportunistic and adapted to prevailing conditions. Sustainability should be seen as a long-term goal aimed at maintaining demographically and ecologically viable populations of species rather than holding populations at particular levels.

All use regimes result in changes to ecosystems and such changes require adaptive management.

**PRINCIPLES OF AN ECOSYSTEM
APPROACH**

Rationale: Apart from their inherent dynamics of change, ecosystems are beset by a complex of uncertainties and potential “surprises” in the human, biological and environmental realms. The ecosystem approach must use adaptive management to anticipate and cater for such changes and events and should be cautious in making decisions which may foreclose options.

(a)

(a) (b)

10. The ecosystem approach should seek the appropriate balance between conservation and use of biological diversity.

Rationale: There has been a tendency in the past to manage components of biological diversity either as protected or non-protected. There is a need for a shift to more flexible situations where conservation and use is seen in context and the full range of measures are applied in a continuum from strictly protected to human-made ecosystems.

11. The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.

SUSTAINABLE USE PRINCIPLES

Rationale: Uncertainties will affect uses of ecosystems and species populations. Policy makers need to recognize that:

(a) consumptive and non-consumptive uses result in impacts on ecosystems which may be positive and/or negative;

(b) commercial and subsistence uses of ecosystems are extremes of a continuum of different kinds of uses;

(c) successful sustainable use can begin with cautious off-takes that are adjusted over time according to an ongoing adaptive management system based on a monitoring programme.

At the level of the ecosystem, the supply of biological products and ecological services available for use is limited by intrinsic biological characteristics of both species and ecosystems, including productivity, resilience, and stability, which themselves are subject to extrinsic environmental change.

Rationale: Use, whether consumptive or non-consumptive, is the derivation of benefit from a resource. Objectives for ecosystem management are determined by humans (Principle 1 of the Ecosystem Approach) and the measure of success for sustainable use and conservation is maintenance of biological diversity at the ecosystem level.

The achievement of sustainable use requires the application of monitoring systems that can be implemented by users.

PRINCIPLES OF AN ECOSYSTEM APPROACH

Rationale: Information from all sources is critical to arriving at effective ecosystem management strategies.

12. The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

Rationale: Most problems of biological diversity management are complex with many interactions, side-effects and implications, and therefore should involve the necessary expertise and stakeholders at the local, national, regional and international level, as appropriate.

SUSTAINABLE USE PRINCIPLES

Rationale: The information needed to achieve sustainability of any use will depend, to a large extent, on the institutional context in which the resource is being managed. Under adaptive management systems, sustainability may be achieved using different monitoring techniques in different situations. Traditional institutions and knowledge may suffice in some, whereas in others, the most modern technology may be needed. A judicious mix of local civil knowledge and modern scientific methods may be best suited to meet changing circumstances within particular use systems.

The sustainability of resource use requires a multi-disciplinary approach and the involvement of all relevant stakeholders.

Rationale: The foregoing eleven principles indicate that sustainability has to be approached in the social, economic, and biological realms. In considering the views of all relevant stakeholders in research, analysis, and decision-making, it is essential to take account of different stakeholder's perspectives, giving highest priority to those of local communities/landholders.

6. Conclusions

22. The principles of an ecosystem approach as proposed in the CBD document UNEP/CBD/COP/4/Inf.9 provide a suitable framework for developing principles of sustainable use.
23. It would seem important that future work of the Conference of the Parties (COP) maintains a close link between the ecosystem approach and sustainable use. The principles are not merely cross-cutting through thematic areas - they are over-arching. The need for such a linkage is explicit in a number of the decisions from COP-4. For example:
- The work program for Inland Water Ecosystems begins with the paragraph: *Recognizing the importance of adopting an ecosystem approach that integrates conservation and sustainable use of biological diversity . . .* (Decision IV/4, Annex 1); and
 - The work program for conservation of Forest Biological Diversity begins with the statement that *"Holistic and inter-sectoral approaches that integrate the conservation and sustainable use of biological diversity, taking account of social and cultural and economic considerations . . ."* (Decision IV/7 II.10).

24. In developing the principles of sustainable use outlined in this document, it is clear that incentives are central to achieving sustainability. In accordance with the provisions of Article 11 of the CBD, therefore, future considerations of sustainable use should remain closely linked to work on incentives. Decisions from COP-4 encourage this - the following two paragraphs are taken from Decision IV/10 on *Measures for implementing the Convention on Biological Diversity*, (Section A on Incentive measures):

The Conference of the Parties,

Reaffirming the importance for the implementation of the Convention of the design and implementation by Parties and Governments of economically and socially sound measures that act as incentives for the conservation and sustainable use of biological diversity, and

Recognizing that incentive measures should be designed using an ecosystem approach and with the targeted resource management audience in mind, . . .;

In addition, the work programme for Agricultural Biodiversity seeks “. . . the identification of incentives to overcome constraints and enhance the conservation and sustainable use of agricultural biological diversity . . .” (Decision IV/6, paragraph 6).

25. The development of indicators for biological diversity will be directly relevant to sustainable use. Indeed, in any given instance within a thematic area of the CBD, the same indicators may measure success in conserving biological diversity and achieving sustainability of uses.
26. Although the Parties to the CBD have decided to apply the concept of equity in benefit sharing in the narrow context of genetic resources, case studies on sustainable use indicate that this principle can be extended broadly to the sharing of benefits derived from biological diversity in all its forms as defined in Article 2 of the CBD.
27. It thus becomes a matter of increasing importance in the organization of the CBD work programme to ensure that so-called “cross-cutting” agenda items such as the ecosystem approach, sustainable use, incentives, biodiversity indicators and benefit-sharing are considered simultaneously and consistently across all the thematic areas.
