

Using the Ecosystem Approach to implement the CBD.

A global synthesis report drawing lessons from three regional pathfinder workshops.

R. D. Smith and E. Maltby

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three regional *pathfinder* workshops**

By Richard D Smith and Edward Maltby

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ACRONYMS AND DEFINITIONS

ADMADE	Administrative Management Design
CBD	Convention on Biological Diversity
CCD	Convention to Combat Desertification
CHM	Clearing House Mechanism of the CBD
COP	Conference of Parties of the CBD
EA	Ecosystem Approach
GEF	Global Environment Facility
IPM	Integrated Pest Management
IUCN	International Union for Conservation of Nature – World Conservation Union
IUCN-BPCD	IUCN Biodiversity Policy Coordination Division
IUCN-CEM	IUCN Commission on Ecosystem Management
IUCN-ROSA	IUCN Regional Office for Southern Africa
knowledge base	The data, knowledge and rules used to solve a problem
LEAP	Local Environment Action Plan
LIFE	Living in a Finite Environment Programme
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non Governmental Organisation
NTFP	Non Timber Forest Product
Ramsar	Convention on Wetlands, adopted in Ramsar, Iran, 1971
SADC	Southern African Development Community
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
UNESCO-MAB	The Man and the Biosphere Programme of the United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Resources Institute
WWF	World Wide fund for Nature

PREFACE

This report forms part of a project entitled *An Ecosystem Approach under the CBD, from concept to action*. Under the project three regional pathfinder workshops were organised in response to Decision V/6 on the Ecosystem Approach (EA) taken in May 2000 by the fifth Conference of the Parties (COP5) of the Convention on Biological Diversity.

The EA was adopted at the second Conference of the Parties of the CBD as the primary framework for action under the Convention. Decision V/6 is the first agreed definition and elaboration of the EA under the CBD. It follows a long process of expert consultation and discussion (Appendix 2).

In summary, COP5

- endorsed the description and operational guidance of the approach contained in decision V/6;
- recommended that Parties apply twelve Ecosystem Approach Principles using the five Operational Guidelines;
- called for efforts to build awareness of the EA;
- requested practical expressions of the approach in various contexts to be developed using case studies and workshops; and
- requested the Executive Secretary of the CBD Secretariat to use lessons learned from workshops and case studies to prepare guidelines on implementation of the approach before the seventh COP.

In addition to the Parties at COP5, many other bodies endorse decision V/6. A number of these organisations came together to co-convene the three regional workshops that are the main subject of this report. The workshops were designed to bring together key stakeholders to build awareness of the EA, collect and examine practical examples from contrasting world regions of key aspects of the EA and identify priority actions for implementing the EA. Specifically, this report draws lessons from three regional workshops that were held following COP5 in 2000, in Southern Africa (July), South America (September) and in Southeast Asia (October).

In addition to this global synthesis report, reports on the three regional workshops are available. Readers with a particular interest in the target regions are encouraged also to examine the discussions and analysis of the relevant regional report. This report aims to summarise the conclusions from each regional workshop in particular to enable sharing of experiences relevant to application of the EA and identify recommendations that are widely relevant to Parties and other bodies. It is hoped that this report will stimulate further debate and encourage Parties to examine further how best to implement the EA in their own particular circumstances.

The workshops brought together technical experts on the EA from the field with policy and planning practitioners from Governments in three regions. They were *pathfinder* workshops, that is they were designed to examine the newly defined EA in different regional contexts and to serve as guidance for the further steps that are required to make the EA a practical reality in all Parties. It is hoped that this and the regional reports will assist Parties and other relevant bodies as they work towards taking the EA under the CBD from concept to action.

Overall coordination and planning for the workshops was undertaken in cooperation with the Secretariat of the CBD by the Royal Holloway Institute for Environmental Research (University of London, UK) on behalf of IUCN-CEM, UNESCO-MAB, The Convention on Wetlands (Ramsar, 1971) and WWF-International and with the support of IUCN-BPCD and the IUCN Regional Offices for Southern Africa, South America and Asia.

I. SUMMARY

1. Workshop participants welcomed Decision V/6. There was broad endorsement for the definition and description of the EA in Decision V/6 and agreement that the Ecosystem Approach (EA) is a highly appropriate framework for delivering the objectives of the CBD.

2. In short, the EA is:

a strategy for management of land, water and living resources that promotes conservation and sustainable use in an equitable way.

3. The EA was identified as being similar to a number of other holistic approaches to conservation, development and natural resource management. Indeed, in many respects the EA represents a codification of previously applied strategies. This codification was welcomed as it has the potential to provide significant momentum to efforts to integrate biodiversity management into development practice and decision making generally.
4. Some key distinguishing features of the EA are that it:
- 1) is designed to balance the three CBD objectives;
 - 2) puts people at the centre of biodiversity management;
 - 3) extends biodiversity management beyond protected areas while recognising that protected areas are also vital for delivering the CBD objectives; and
 - 4) engages the widest range of sectoral interests.

Building awareness and understanding

5. The workshops demonstrated that significant further efforts are needed to build awareness and understanding among technical specialists and the wider community alike. The EA is not the *ecosystems* approach. It is therefore necessary to increase awareness that the EA as described in Decision V/6 is a framework for holistic decision making and action, not a set of guidelines for managing specific ecosystems. Interpretation of Decision V/6 needs to be assisted by practical on-the-ground examples, such as the case studies presented at the pathfinder workshops. Problem-specific, practical guidelines that supplement the Operational Guidelines need to be developed to guide users. The short definition of the EA (paragraph 2) can usefully convey their key features of the approach.
6. Improved community-level understanding of the ecological thinking that underpins the EA is best achieved through community efforts in which empowered community members train one another. Regional centres may also be appropriate for training, empowerment and awareness building. The case studies presented at the workshops illustrated most aspects of Decision V/6 and a number of CBD thematic areas and cross-cutting issues. Interested organisations and Parties are encouraged to help build understanding and awareness of the EA by drawing attention to the definition and description of the EA in Decision V/6 in their related work.
7. Generally, awareness is lacking of the significance of ecosystem functioning. There is inadequate recognition that ecosystem services are vital for human social and economic welfare as well as wildlife. This lack of understanding is likely to hold back adoption and application of the EA. Greater efforts are therefore needed to build on current levels of scientific understanding of ecosystem functioning and to communicate the significance of such functioning to non-specialists. Adoption of the EA is also likely to benefit considerably from new and generally agreed financial and political mechanisms that will allow the economic and wider value of ecosystem functioning to human well-being to be realised in decision-making processes.

Interpreting Decision V/6

8. The workshop case studies illustrate that the EA is highly flexible as it can be applied at a wide range of scales to address a diversity of problems in the management of biological diversity to simultaneously achieve conservation, sustainable development and equitable sharing of the benefits of genetic resources. However, pilot projects could usefully demonstrate not only a greater diversity of EA applications, but also the advantages of adopting the EA from the outset to achieve CBD objectives.

9. In practice, there are a number of significant obstacles to decentralised management. A combined bottom-up and top-down approach may often be the best strategy for identifying the most appropriate management scale and mechanism. Higher levels of organisation are often essential actually to implement local actions on the ground.
10. The EA is a unifying tool that is an appropriate basis for mainstreaming the CBD into policy making. Mainstreaming the EA requires the engagement of professionals from other sectors of the economy and society (including industry) who are likely to be less aware of and more hostile to the EA than conservation and natural resource development practitioners. Highly targeted workshops can help to improve the understanding of what the EA is and how its application can ensure the delivery all three CBD objectives among non-natural resource and conservation professionals.

Participation

11. Achieving effective participation is a significant challenge. It is vital to achieve full participation from stakeholders if the EA is to reflect societal choice. A clear expression of societal choice is vital if priority socio-economic needs are to be recognised, activities are to succeed in the long term, appropriate incentives are to be identified and the EA is to be inclusive of all types of knowledge. Active and sustained participation cannot be assumed, even when all stakeholders are encouraged to be involved. A common vision needs to be developed if diverse communities are to adopt the EA. National CBD Focal Points, government agencies, Universities, NGOs and other bodies can all help to raise awareness and encourage participation from professionals.
12. Capacity building is a priority for many countries, both in areas such as taxonomy and in management techniques appropriate for holistic decision making under the EA. A number of priority areas were identified.

Scale: farm to planet

13. The case studies demonstrated that the EA can be applied over a wide range of scales, from an individual farm, to ecologically defined, transnational regions. It can also be applied at a global scale. The most appropriate scale for management, however, is probably best defined by the specific biodiversity problem being addressed.
14. Application of the EA at the national scale could usefully begin with integration of the EA into NBSAPs. National workshops may assist Parties in this integration. Internationally, the EA may be an appropriate framework for ensuring that international trade does not compromise the objectives of the CBD in Parties.

Timescales

15. Different stakeholders have contrasting time scales for planning and the delivery of objectives. These timescales probably cannot be changed but there is a need for them to be managed if the EA is to be successfully implemented. Long term objectives have drawbacks for some stakeholders who are necessarily motivated by the need for immediate results. This is particularly the case for individuals and communities who depend directly on natural resources for economic or basic life support. Immediate incentives are therefore needed if long-term aims are to be delivered. The typically short term cycle of projects has often been a major obstacle to the long term viability of initiatives but there are strategies for overcoming the limitations of short term funding.
16. Adaptive management may be new to many organisations and individuals. There is often scientific uncertainty about factors that determine ecosystem functioning, hence management should be adaptive to lessons learned in the field and responsive to ongoing advances in scientific understanding. Monitoring of appropriate indicators is vital for adaptive management yet guidelines and case studies on this theme are currently insufficient.

Benefit sharing

17. There are potentially many innovative approaches to benefit sharing under the EA and further guidance on this would be appropriate. Benefit sharing need not involve financial payments as management based on ecological principles often results in significant financial savings. Yet such savings have frequently not been realised due to insufficient awareness or the influence of perverse incentives. In other cases, it is unlikely that costs and benefits can be internalised within ecosystems in every case, for example if ecosystems are managed to sequester carbon, a function that benefits the whole world.
18. Delivering the CBD objectives through the EA may, in some circumstances, require socio-economic priorities to be addressed before biological and ecological concerns. The removal of perverse incentives is a priority if societal choice is to appropriately balance the economic needs and aspirations of people with the conservation and sustainable use of biological diversity.

Information management for decision making

19. Knowledge bases that integrate scientific and local knowledge can greatly assist decision making under the EA. There is a need for close cooperation between holders of indigenous and scientific knowledge when constructing knowledge bases to address biodiversity problems. Scientific and socio-economic knowledge and decision-relevant data, for example consultants' reports and information held in ministries, should be made more widely available and in particular shared among ministries and the wider public.

Structural and inter-sectoral issues

20. The sectoral structure of decision making is a major constraint to adoption of the EA. In addition there are often barriers to information flow between institutions. It is unlikely that new, integrated decision making structures can be formed in most countries. Policies, laws, fiscal measures, incentives and institutional mandates should therefore be harmonised as a priority so that each enables implementation of the EA. Implementation of the EA need not necessarily require legal enforcement: with greater awareness win-win situations can be promoted and voluntarily adopted. Existing or new inter-ministerial working groups or committees may be appropriate for creating the necessary linkages between the various decision-making sectors.
21. Regional political structures can be used to address transboundary problems using the EA. Existing transnational protocols may facilitate on-the-ground implementation of the EA.
22. The EA is consistent with the objectives of other international environmental agreements. The synergy between conventions can be used to promote their collective implementation. In many countries, implementation of Decision V/6 is likely to benefit significantly if the capacity of the CBD National Focal Point or other coordinating authority is increased so that they are able to drive implementation of the EA.

The EA and other conservation strategies

23. Protected areas can be an integral part of the EA. A particular feature of the EA however is that it can be applied more generally outside protected areas. Many threatened charismatic species occur outside protected areas. Under the EA it may be possible in some situations to win sufficient popular support for the charismatic species to ensure strategies are adopted that enable people to meet their development needs sustainably and without jeopardising the charismatic species. Guidelines are needed on how to use the EA to achieve *in situ* conservation of charismatic and other species over wide areas. Clear guidance is also needed for conservation professionals and non-specialists alike on how the EA relates to protected areas. Such guidelines should draw on case studies that would include Biosphere Reserves and other protected areas, some of which have high human populations.

II. INTRODUCTION

24. This report draws lessons from three regional workshops. Key points of the discussions are highlighted in the following section “Key Questions and Issues”. Recommendations are summarised in Section IV.

A. Objectives of the three regional workshops

25. Case studies and discussions with key stakeholders in the region were used to provide lessons for the practical implementation of the EA. Specifically, the workshops aimed to:
- **Build awareness** in the region by using case studies to illustrate aspects of the EA under the CBD
 - Examine perceived **constraints** in using the approach with a variety of relevant stakeholders
 - Share experiences from the region of **opportunities** for taking action under the EA
 - Identify some key **priority measures** that are needed to facilitate implementation of the EA in the region
 - Identify **capacity building** priorities (human and technical)
 - Suggest when **other approaches** may be more appropriate.

B. Format of workshops and stakeholder participation

26. Each workshop followed a similar programme. At each workshop an introduction was given to the process leading to Decision V/6 and an explanation of the workshop objectives. National CBD Focal Points were invited to participate from each country in the target regions (Table 1). The workshop objectives were addressed by a series of case study presentations and facilitated discussions in working groups and plenary.
27. For a list of participants at each workshop, see Appendix 3. For summaries of the case studies, see Appendix 1. Complete case study papers will be available via the CHM of the CBD.

Region	National CBD Focal Points participating	Number of countries in region
Southern Africa	6	11
South America	10	13
Southeast Asia	7	7

Table 1: Participation of National CBD Focal Points

C. Case studies

Practitioners of conservation and sustainable development presented twenty-nine case studies, primarily from a number of regionally based field-level organisations. A group of regional experts made the case study selections with the aim of identifying a set of regional activities that were both representative and suitable for illustrating a number of key aspects of Decision V/6. The selected case studies were varied in scale, thematic area and cross-cutting issues addressed (Table 5). Case study authors were given guidelines (developed by the CBD Secretariat; Appendix 4) on how to analyse their material so as to meet the objectives of the workshop.

III. KEY QUESTIONS AND ISSUES

28. Workshop case studies and discussions addressed a number of issues during their consideration of Decision V/6. Where there is a direct relevance to a Principle or Operational Guideline this is indicated in **bold**.

A. Awareness and understanding

WERE THE CASE STUDIES APPROPRIATE FOR RAISING AWARENESS OF THE EA?
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29. One of the key aims of the workshops was to use case studies to build awareness of Decision V/6. It was not expected that all Principles and Operational Guidelines would be illustrated by each case study because the case studies reported on experiences that occurred prior to the adoption of Decision V/6. Each case study was therefore selected to illustrate aspects of the decision. The extent to which the case studies illustrated the Principles, Operational Guidelines, CBD thematic areas, and CBD cross-cutting issues is summarised in Table 4 and Table 5.
30. Collectively, the case studies illustrate varied aspects of Decision V/6 and a wide, but not comprehensive, range of thematic areas and cross-cutting issues. In particular, the case studies demonstrate:
- the great range of scales at which it is possible to apply the EA, from the single fields of farmers practising Integrated Pest Management in Asia, to the East Africa Marine Ecoregion;
 - the diversity of problems that can be tackled using the EA;
 - that additional cases and pilot projects are likely to illustrate application of the EA to an even wider range of problems and scales.
31. The EA is the primary framework for delivering the three objectives of the CBD: conservation, sustainable use, and equitable sharing of benefits. All case studies feature examples of efforts to address social concerns while achieving conservation or sustainable use. Equitable sharing of benefits was often an element of the strategy followed to achieve the main objective(s). Analysis of the case studies indicates that generally they focused on one or two of the CBD objectives rather than on all three simultaneously or with equal priority. The workshops considered that it is perhaps appropriate that, so long as all objectives are considered, one or two are prioritised. This issue needs examination in any further guidelines for implementation of the EA that are developed.
32. **Summary**
- *The workshop case studies illustrate that **the EA is highly flexible** as it can be applied at a wide range of scales to address a diversity of problems in the management of biological diversity.*
 - *When implementing the EA, all three **CBD objectives** need to be considered. However, it is not always essential to strive for each objective simultaneously and with equal priority. With the right approach it is likely that an appropriate balance of all three objectives can be achieved.*
 - ***Pilot projects** could usefully demonstrate not only a greater diversity of EA applications but also the advantages of adopting the EA from the outset to achieve CBD objectives.*

WHAT IS NEW ABOUT THE EA?

33. The workshops generally thought that the EA was not entirely new as it has many similarities with other conservation and development strategies such as, for example, Biosphere Reserves, Ecoregions and Integrated Catchment Management. The adoption of another new term was initially a cause of confusion for the participants who characterised

the EA as holistic, flexible, socially oriented, scientifically based, and respectful of cultural preferences, usage and traditions. However, following the workshop discussions and presentation of case studies the similarity of the EA to other approaches was not seen as an obstacle to its acceptance. Rather, the description and elaboration of the EA in Decision V/6 was welcomed as an appropriate codification of actions and strategies that have been practised to a significant extent under different names previously. The codification of the EA under the CBD has the potential to provide significant momentum to efforts to integrate biodiversity management into development practice and decision making generally. In other words, the EA was generally welcomed as a unifying tool, one that should be used to mainstream biodiversity into decision making locally, nationally and internationally.

34. Mainstreaming of the EA into government policy and practice will require biodiversity factors to be integrated into other sectors, as called for by the COP (for example, CBD Decision III/9 para 2). The workshops thought that integration of the EA was appropriate in natural resource sectors such as water resources, agriculture and fisheries. The need was also recognised for higher-level integration into policymaking and legislative processes. Mainstreaming of the EA could serve as the framework for wider integration of CBD Decisions into specific sectors. However, participants were concerned that Decision V/6 alone is not a sufficient basis for action. The Operational Guidelines, while welcome, should be supplemented with problem-specific guidelines that would help users overcome any apparent vagueness in Decision V/6. Other strategic (Table 2) and on-the-ground (Table 3) steps for mainstreaming the EA were also identified.

EXAMPLES OF STRATEGIC STEPS FOR MAINSTREAMING THE EA
Enhance understanding and awareness of the approach among policymakers, planners, politicians and local authorities, for example by holding workshops designed specifically for employees of various sectors
Conduct a review of existing sectoral and cross-sectoral policies, plans and programmes (including, but not limited to, those of Departments of Wildlife, Forest, Fisheries, Agriculture, etc.) vis-à-vis Decision V/6 to identify where reforms and changes are needed
Undertake stakeholder consultations to reach a consensus on how to apply the approach to address different problems
Use or establish an inter-Ministerial committee to oversee implementation of Decision V/6
Integrate the EA into NBSAPs
Establish taskforce(s) to take forward specific areas of proposed reforms

Table 2: Mainstreaming the EA: priority strategic steps

EXAMPLES OF ON-THE-GROUND STEPS FOR MAINSTREAMING THE EA
Perform an assessment of on-going projects, programmes and other field level activities to identify compliance with the EA
Identify priority locations and issues for action by undertaking baseline biodiversity surveys that include measures of ecosystem integrity, diversity and an evaluation of goods and services. Detailed biodiversity and landscape data, although useful, is not needed to establish priorities. The most efficient approach is to identify threats to biodiversity, for example through interviews.
Knowledge bases should be constructed that integrates and synthesises the scientific and indigenous knowledge that is relevant to the conservation, use and assessment of biodiversity.
Develop and implement awareness-building measures tailored for field practitioners and local communities
Identify existing local-level institutions, stakeholders and management systems that are suitable for applying the EA
Identify institutional and socio-economic obstacles to meeting the CBD objectives
Encourage NGOs and other appropriate bodies to promote and facilitate implementation of the EA at local level

Table 3: Mainstreaming the EA: priority on-the-ground steps

35. Summary:

- *The EA is a unifying tool that is an appropriate **basis for mainstreaming the CBD** into policy making.*
- *Mainstreaming the EA requires the **engagement of professionals from other sectors** of the economy and society (including industry, agriculture, finance) who are likely to be less aware of and more hostile to the EA than conservation and natural resource development practitioners.*
- *Highly **targeted workshops** can help to improve the understanding of what the EA is and how its application can ensure the delivery all three CBD objectives among non-natural resource and conservation professionals.*
- ***National and thematic workshops** may be the most appropriate way for Parties and others to develop specific, practical guidelines.*

THE EA UNDER THE CBD: ADOPTING A COMMON DEFINITION

36. The similarity of the EA to other approaches should perhaps be viewed as a strength: it shows the potential for related approaches to be described to non specialists (including policy makers) by comparison to the EA. Communication with non-specialists could be enhanced by the adoption of a common language based on Decision V/6. It may help build understanding and avoid confusion if, for example, Biosphere Reserves are now routinely referred to as an example of the EA under the CBD. However, for a common language to be used, all interested organisations and Parties need to use the EA in their related work. To date, this has not happened, as illustrated by the World Resources Institute who, although referring to Decision V/6, adopted their own definition of *ecosystem approach* (including a set of principles) in a recent publication¹.

37. Summary

- *Interested organisations and Parties are encouraged to help build understanding and awareness of the EA by drawing attention to **the definition and description of the EA in Decision V/6** in their related work.*

THE EA IS NOT THE ECOSYSTEMS APPROACH

38. A common confusion among participants was that the EA is the *ecosystems* approach, i.e. that it is an approach that is specifically tailored to the management needs of various ecosystem types such as forests, savannas and wetlands. A continued effort is needed to communicate the fact that the EA is not a set of guidelines for the management of various ecosystems but is a framework for thinking and acting *ecologically*. It is a framework for action that links biological, social and economic information and achieves a socially acceptable balance between nature conservation priorities, resource use and the sharing of benefits. In particular it is a framework that removes the artificial barriers between the human economy, social behaviour and the natural environment – in other words it places people firmly within the ecosystem model. The participants thought that the case studies presented at the workshops usefully demonstrated a number of the potential ways in which the EA is a framework for balancing the CBD objectives through actions based on holistic decision making.

¹ WRI / UNDP / UNEP / World Bank (2000) *Adopting an Ecosystem Approach*. In: *World Resources 2000-2001 - People and Ecosystems: the Fraying Web of Life*: pp.225-239. World Resources Institute, Washington DC, USA.

39. Summary

- *The EA is a framework for action based on holistic decision making, not a set of guidelines for managing various ecosystems.*

COOPERATION REQUIRES IMPROVED COMMUNICATION TO INCREASE AWARENESS AND UNDERSTANDING

40. User friendly materials can help communicate:

- The EA,
- scientific knowledge and
- indigenous knowledge

more widely, thereby helping all relevant sectors to be involved with delivering the EA (Principle 12).

41. Summary

- *Awareness and understanding of the EA under the CBD needs to be significantly enhanced among both non-specialists and conservation specialists.*

BUILDING ECOLOGICAL AWARENESS AND UNDERSTANDING AMONG FARMERS AND OTHER PRODUCERS IS KEY TO THE SUCCESS OF THE EA

42. Farms, fisheries, forests and other productive systems that are viewed and understood ecologically are likely to be managed with greater benefit to both the farmer and ecological functioning. Adopting an ecological perspective typically results in lower costs to farmers or those restoring ecosystems due to reductions in the input of fertilisers, herbicides and pesticides. Reducing such inputs has been shown in many systems to increase biological diversity, have a positive impact on sustainability and, in some circumstances, improve productivity and even human health, for example when pesticide use is reduced, spider populations increase and mosquito numbers (and hence malaria and other diseases) fall.



43. Summary

- *Farming and other productive systems are often most efficient when undertaken using ecological principles.*
- *Improved farmer understanding of ecological thinking is best achieved through community efforts in which farmers learn from the practice of others.*

OTHER THAN CONSERVATION, WHAT OTHER SECTORS NEED TO BE MADE AWARE OF THE EA?

44. The workshops thought that the EA needs to be much more widely communicated if it is to have a significant on-the-ground impact. It was thought that widening awareness to include development practitioners, planners, economists, industrialists and sociologists was vital if the EA, and hence the CBD, is to become mainstreamed into better decision making.

45. Many participants also thought that a significant effort is needed to raise awareness of the EA among the general public. However, there was concern from some that the EA as currently described is too complex to be widely disseminated and that a shorter, easily remembered summary description of the EA would greatly help its wider communication, even among conservation and natural resource specialists.

46. The Southeast Asian workshop expressed a strong interest in creating a regional centre on the EA to be established to provide training for the region. In Southern Africa the

participants identified the need for a variety of training from full-length university courses, to workshops for professionals in diverse sectors. In South America, participants identified National Workshops as a key next step in building awareness both within and beyond the conservation sector.

47. Summary:

- *Efforts are needed to translate Decision V/6 into **a short, easy to communicate message** to build awareness and understanding among environmental specialists and the general public alike.*
- **Regional centres** may be appropriate for training and awareness building.

DO THE CASE STUDIES ILLUSTRATE THE PRINCIPLES, OPERATIONAL GUIDELINES, CBD THEMATIC AREAS AND CROSS-CUTTING ISSUES?
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48. Table 4 identifies the Principles and Operational Guidelines that each case study illustrates most clearly.

49. Table 5 identifies those case studies that best illustrate the various work programme themes under the CBD. The EA is one of a number of cross-cutting thematic areas under the Convention, i.e. issues that do not relate to specific biomes. Other cross-cutting themes, and the case studies that best illustrate them, are also listed in Table 2.

50. Summary

- *The **case studies** presented at the workshops illustrated varied aspects of the Decision V/6 and a number of CBD Thematic Areas and Cross-cutting issues.*

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Table 4 An assessment² of which case studies best illustrate the 12 Principles and 5 Operational Guidelines of Decision V/6

Case study	Principles												Operational Guidelines				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Southern Africa																	
1 Application of the EA from the Zambezi Basin Wetlands Conservation and Resource Utilisation Project - Excellent Hachiloka - IUCN/ROSA	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
*2 Mountains, Eynbos and Water - Mark Jonas & P. Pool - Kgalabane Biosphere Reserve / UNESCO/MAR	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3 Consideration of the Campfire Programme under the EA of the CBD - Lynda Muiakachi - Africa Resources Trust	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4 The Ecosystems Approach: Experiences Of The Biodiversity Foundation For Africa And The Zambezi Society - Jonathan Timberlake	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5 Sustainable Management of Indigenous forests - Kamwamba - Mwanza East Malawi - Estera Tsoka - SADC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6 Eco-Region based conservation: the case of the East African Marine Eco-Region - Irene Kamau - WWF-Tanzania	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
*7 Lake Kariha fisheries management - Cecil Machona - Africa Resources Trust	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
8 Catchment Rehabilitation: the Zimuto-Mshagasho - Zimbabwe Experience - Taboth Matiza-Chiuta - IUCN/ROSA	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
*9 The Cape Action Programme - Rob Little - WWF-South Africa	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
10 Management of the Pandiari Biosphere Reserve and the EA - Comlan Hassou - Agence Béninoise pour l'Environnement / UNESCO/MAR	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
South America																	
11 Choco Ecoregional Project - Yimena Barrera Rey - WWF - Colombia	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
12 Inter-institutional Initiative for the Conservation of Biodiversity in the Pamnas Region of Argentina - Néstor Maccorra - Grupo Nacional de biodiversidad/IUCN	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
13 Ecological Corridors: Ecosystem Approach of Environmental Management - Moacir Bueno Arruda and Diana Angélica de Araújo Côrte - IBAMA, Brazil	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
14 The Marine Reserve of the Galapagos - Eliacer Cruz Bedón and Mario Piu Guíme	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
15 Director Plan: Biosphere Reserve Bañados del Este - Uruguay - Francisco Billa - PROBIDES	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
16 La Seara Swamp Management: An integral management strategy - Manfred Altamirano - Graciela Trillas and Segundo Coello	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
17 Management and Integral Use of the Tumbes Mangrove Swamp - Perú - Gustavo Suarez de Freitas - Pro Naturaleza	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
18 A management proposal for Beni Biological station - Carmen Miranda - María Marconi and Inor Patzi - Academia Nacional de Ciencias - ICIB	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
19 Vinal Project: application of the Ecosystem Approach in Argentina - Jorge Adámoli - Astrada - E - Blasco - C - Meli - P - Florio y A - Cirelli - V - GSEER	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
20 Integral Protection Program for the El Guácharo National Park - Marisela Rabascall and María Henrika Caraballo	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Southeast Asia																	
21 Large scale ecosystem health assessment of the Langat Basin in Malaysia: Biodiversity conservation - Prof. Dr. Mohd. Nordin Hi. Hasan - LESTARI	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
22 Community based tiger conservation in Cambodia - Sun Hean - Department of Forestry and Wildlife - Cambodia	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
23 Rice IPM as an application of the ecosystem system approach in Indonesia and elsewhere in Asia - Dr. Peter A. C. Ooi - FAO	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
24 The first step to calculate the total economic value of Can Gio mangrove ecosystem (after 22 years of reforestation) - Le Duc Tuan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
25 The role of Malauca wetlands in providing ecosystem services for people and the environment in the Mekong Delta - Vietnam - Duong Van Ni	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
26 Non-Timber Forest Products in Lao PDR: a practical application of the ecosystem approach? - Inost Fennes and Rachel Dechaineux	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
27 Integrated conservation development programme for Siberut Biosphere Reserve - Ir. Zuwendra	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
28 Chenderoh Reservoir - Perak - On the conservation and sustainable use of aquatic resources in a socially discontinuous river continuum - Prof. Dr.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
29 Ecoregion conservation in Cambodia, Lao PDR and Vietnam - Ben Hodadan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

² In their present form some case studies (indicated by *) do not sufficiently relate their analysis to Decision V/6. Further analysis of these case studies is recommended.

	Case studies ³ that best illustrate CBD thematic areas and cross-cutting issues		
Thematic area	Southern Africa	South America	Southeast Asia
Forest biodiversity	5, 10	11, 13, 17, 18, 19, 20	21, 22, 24, 26, 27
Marine and coastal biodiversity	6, 9	11, 14, 15, 17	21, 24
Inland waters biodiversity	1, 2, 4, 7, 8, 10	12, 15, 16, 17, 19	21, 25, 26, 28
Dry and sub-humid lands biodiversity	2, 3, 4, 8, 10	12, 18, 19	22, 26
Mountain area biodiversity	2, 9	11, 12, 20	21, 22, 26
Agricultural biodiversity	10	11, 12, 15, 18, 20	21, 23, 25, 26, 27
Cross-cutting theme	Southern Africa	South America	Southeast Asia
Invasive alien species	2, 9	12, 19	21, 27
Indicators of biodiversity	2, 9	11, 12, 17, 19	21, 23, 26, 28
Incentives	1, 3, 6, 7, 10		23, 24, 25, 26, 27
Impact assessments	4	11, 12, 18, 19	21, 23, 24, 25, 26, 28
Benefit sharing	3, 5, 7, 10	14, 18, 19, 20	24, 25, 26, 27, 28
Indigenous and local communities	2, 5, 7, 10	11, 13, 14, 16, 18, 19	22, 23, 24, 25, 26, 27, 28
Sustainable use	1, 2, 3, 4, 5, 6, 7, 8, 10	11, 12, 13, 15, 16, 17, 18, 19, 20	21, 22, 23, 24, 25, 26, 27, 28
National Biodiversity Strategy and Action Plans	1, 3, 6, 9	11, 12, 17, 19	27

Table 5: Case studies that illustrate thematic work programmes and cross-cutting issues

B. Interpreting Decision V/6

DOES DECISION V/6 PROVIDE SUFFICIENT GUIDANCE ON IMPLEMENTING THE EA?

51. Even conservation and biodiversity professionals find interpretation of Decision V/6 challenging. While the Principles and Operational Guidelines were accepted as being widely relevant, they were also found to be very general and lacking in guidance on how they should be applied to address specific problem scenarios. In particular, tools and guidance need to be developed that:

- 1) address the variety of typical problems encountered; and
- 2) are relevant at the operational level.

Without such guidelines interpretation of the EA (Decision V/6) is likely to be hampered by its theoretical and general nature.

52. Summary

- **Case studies which illustrate problem-specific, practical guidelines** are needed that help Parties and others to use the EA. The pathfinder workshops have examined some case studies but Parties are encouraged to examine others which may be most appropriate to their own circumstances.

IS IT NECESSARY, IN EVERY SCENARIO, FOR ALL PRINCIPLES AND OPERATIONAL GUIDELINES TO BE APPLIED FOR AN ACTIVITY TO BE DESCRIBED AS THE EA?

53. The above question commonly arose in discussions and participants had a variety of responses. Some argued that all Principles must always be applied and that it is not

³ See Table 4 to identify the numbered case studies.

possible to identify a sub-set of core Principles. There was more support for identifying a different sub-set of core Principles for each type of problem, an idea that was also attractive because it would then be possible to define the EA more simply and concisely using fewer Principles. There was also some support for making the Operational Guidelines the core of the approach, while each Principle would be considered in each case *but not necessarily applied*. This interpretation of V/6 would require that all Principles be *considered* in each problem scenario and that if a Principle was not applied then the reason for its omission must be rationalised. However, the majority of participants thought that, depending on the scenario or problem being addressed, one or more Principles could be omitted and the activity could still fairly be described as the EA. In fact, few if any case studies applied all Principles but the consensus was that most cases were nonetheless effective at illustrating the EA.

54. Summary

- *The workshops considered that the **Operational Guidelines were not sufficient** and that it would be appropriate for Parties and others to develop specific, problem-related guidance on the EA.*

WHICH PRINCIPLES AND OPERATIONAL GUIDELINES HAD THE GREATEST AND LEAST RELEVANCE?

55. **Principles 1, 2 and 12** had the greatest overall relevance to the case studies (Table 4). This indicates that the most important aspects of Decision V/6 in many cases are societal choice, decentralised management and the engagement of the widest possible range of stakeholders. In other words, those aspects of the EA that relate to effective participation were most commonly emphasised in the case studies.

Case study 1, 3, 5, 8, 10, 11, 12, 14, 19 22

56. **Principles 3, 6, 7 and 9** were considered to have least relevance to the case studies overall. This suggests that relatively few case studies applied ecosystem science (**Principles 3, 6 and 9**) or explicitly considered how to identify the most appropriate scale for using the EA to tackle particular problems (**Principle 7**). **Principle 3** was found to be least relevant of all the Principles and suggests that many case studies did not consider the impact on other ecosystems of activities in the project / target area. The lack of importance attached to this Principle may reflect the absence of appropriate (local, national, regional and international) institutional and financial structures and mechanisms that are likely to be needed to address this Principle, namely the valuing of ecosystem services that have benefits which extend beyond their boundaries. For example, ecosystems provide services (such as improvements to water quality) that have little or no immediate financial value or the benefits are realised remotely from the point of application.

57. Summary

- *The case studies illustrate the importance under the EA of **decentralised and participatory** approaches to decision making that seek a broadly agreed **societal choice**.*
- *Greater efforts are needed to integrate **ecosystem science** into on-the-ground EA activities.*
- *A greater effort is often needed to define the **most appropriate spatial and temporal scales** for using the EA in particular circumstances.*
- ***Financial and other mechanisms** are needed that will allow the **economic and wider value** of ecosystem functioning to human well-being to be realised in decision-making processes.*

C. Participation and capacity building needs

ACHIEVING EFFECTIVE PARTICIPATION IS A SIGNIFICANT CHALLENGE

58. The workshops emphasised that participation must be active and “real” from

conceptualisation to management; it should not merely involve representation at a planning workshop. The significance of achieving sustained and active participation was summed up by the South American workshop, which found that:

In many field projects people have a superficial participation, as participation is limited to attending a workshop where they are given some material and asked some questions whose answers are recorded and used to prepare a document. Participation consists of people feeling part of the project and this is a much more difficult challenge, requiring a much more open-handed approach to the work carried out, placing decisions in the hands of the people. It is a long process and they must feel that what they propose is really being carried out.

59. Participation in implementing the EA from existing professionals and wider stakeholders in the CBD can be greatly enhanced if awareness and understanding of the EA is improved by, for example:

- Building capacity of National CBD Focal Points or alternative EA coordinating offices.
- Provision of on the job training by Universities and other bodies to raise awareness and understanding in diverse disciplines.
- Revision of University and other training course curricula to include the EA.
- Establishing regional centres to provide training in the technical and management skills needed to implement the EA.

60. Summary

- *Active and sustained participation cannot be assumed, even when all stakeholders are encouraged to be involved.*
- *National CBD Focal Points, Universities and other bodies can all help to raise awareness and encourage participation from professionals.*

CAPACITY BUILDING IS A PRIORITY

61. The workshops recognised that the EA can only be effectively implemented if the appropriate human and technical capacity is present in each country. Most countries that participated in the workshops indicated that they lacked sufficient expert personnel to undertake actions under the EA to implement the CBD. A number of specific human and technical needs were identified (Table 6). The actual requirement for each technical area needs assessing at the provincial, national and regional levels.

EXAMPLES OF CAPACITY NEEDS
• Biological skills such as ecologists and taxonomists
• Accessible information
• Environmental engineers
• Financial resources
• Resource inventories
• Environmental economists
• Functional analysis tools
• Social scientists
• Development planners
• Training in indicators, monitoring and adaptive management
• Managers that can <ul style="list-style-type: none">• Coordinate multidisciplinary activities• Achieve a collectively agreed vision• Mobilise stakeholders including communities• Manage finances

Table 6: Capacity building: some priority needs

62. Summary

- **Capacity building is a priority** for many countries, both in areas such as taxonomy and in management techniques appropriate for holistic decision making under the EA.

STAKEHOLDER PARTICIPATION IS ESSENTIAL IF SOCIETAL CHOICE IS TO BE RECOGNISED

63. Participation of the widest possible range of relevant stakeholders and sectoral interests in planning and management was considered to be essential for the success of the EA. Participation was considered vital for the identification of societal choice (**Principle 1**), both at the planning stage and when making decisions that are based on adaptive management (**Operational Guideline 3**). Societal choice will only be reflected in planning and management decisions if all interested parties are fully engaged.

64. Summary

- *The workshops emphasised that stakeholder participation is vital for:*
 - *The long term success of activities.*
 - *Creating a sense of ownership and commitment to the EA among communities.*
 - *The inclusion of all types of knowledge (indigenous, local and scientific) in EA strategies.*
 - *Identifying priority socio-economic needs.*
 - *Identify appropriate incentives to encourage long-term participation.*

REALISING SOCIETAL CHOICE REQUIRES RECONCILIATION OF CONFLICTING VIEWS

65. Realising societal choice often, and perhaps typically, requires that a balance be achieved between competing views that are not easily reconciled. Historical tensions between authorities and communities can be an obstacle to participation if they leave an atmosphere of distrust. Conflicts over land rights, between local and global interests and between authorities representing different sectoral interests were commonly cited in discussions. The workshops noted that authorities commonly lack conflict-resolving mechanisms. Participants also acknowledged that participatory processes are time consuming and can be costly. Where communities are keen to participate they very often lack the training and resources to input to the planning and management processes as effectively as the statutory authorities.

Case study 3, 5, 10, 18, 22, 26, 27, 28

66. Summary

- *The difficulties of **reconciling opposing views** to achieve a single identifiable “societal choice” should not be underestimated.*

IT IS VITAL TO ENGAGE ALL STAKEHOLDERS IN LANDSCAPE SCALE DECISION-MAKING.

67. The case studies illustrated many examples of EA-like strategies at the landscape scale. It was noted that the motivation of participants in small-scale activities that meet landscape-scale objectives cannot be assumed. Yet achieving this motivation is vital for the success of the EA at the larger landscape scale. Even when the wider landscape perspective is taken, the engagement of local communities is essential. For example, a multidisciplinary survey at the landscape scale may be used as the basis for targeting small-scale, community-based activities. But activities must be identified and specified *with* stakeholder communities in order to build awareness, support and, vitally, a common vision for the

Case study 1, 4, 6, 11, 17, 21

management of the larger landscape.

68. Summary

- A **common vision** needs to be developed if all relevant stakeholders are to participate in implementing the EA at the landscape scale.

D. Scale

THERE IS NO ONE “LOWEST APPROPRIATE LEVEL”

69. The workshop discussions and case studies demonstrated that the engagement of people is typically most effectively driven by local level management and decision making but that the EA vision may often be most relevant at much larger scales, as illustrated by the case studies of river basins, Biosphere Reserves and Ecoregions. However, the workshops noted that large-scale activities – such as Ecoregion projects - that embrace the EA vision also require effective, locally driven management and engagement. In addition, it is important to note that the EA vision can be applied by individual stakeholders, as in the case study example of Integrated Pest Management (IPM) which illustrates application of the EA at the scale of individual farms or even fields in Asia. The “lowest appropriate level” (**Principle 2, Operational Guideline 4**) may therefore differ widely between problems that the EA may be used to address. This demonstrates the flexibility of the EA: as with the “ecosystem” concept, the EA can be defined according to the issue at hand.

Case study 1, 4, 6, 11, 12, 21.

70. One interpretation of the “lowest appropriate level” is that which is small enough to engage people in activities, yet sufficiently large so as to include the biophysical and human factors that determine the way the ecosystem functions. Following this interpretation, the lowest appropriate level may be a small unit such as a farm in which decision making achieves an appropriate balance, as specified by the EA. An alternative but complementary interpretation is that the EA is best understood as a vision for a wide area, as in the WWF Ecoregions. In this interpretation, management of activities is primarily at the local / village / community / farmer level but these local level actions need not meet all the specifications of the EA so long as they contribute to delivering the balance that the EA vision requires, and all three CBD objectives, at the larger scale. Finally, a number of participants proposed that the EA should be applied to address identified problems and that the appropriate level of management should therefore be defined in each case by the scale of the “problemshed”.

71. Summary

- The EA can be applied at any scale, from a single farm, to ecologically defined, transnational regions. It can even be applied to planet Earth.
- The most appropriate scale for management is probably best defined by the biodiversity problem being addressed.

DEFINING THE SCALE: TOP DOWN OR BOTTOM UP?

72. The “top down” perspective can be essential when defining the appropriate scale of management. In Ecoregions, for example, priority regions are identified according to their global biodiversity significance but actions within the Ecoregions are locally-driven to address local priorities. In other words, the approach seeks to link a “top down” with “bottom up” approaches. The workshops were undecided about the feasibility of this and divided over the role of any top down approach unless it addressed priority needs. However, many participants were in favour of combined top-down and bottom-up approaches and recognised that the value of existing structures (institutional and legal) should be recognised when identifying the appropriate scale(s) and mechanisms of management.

73. Summary

- **A combined bottom-up and top-down approach** may often be the best strategy for identifying the most appropriate management scale and mechanism.
- **Higher levels of organisation** are often essential actually to implement actions on the ground.

OBSTACLES TO DECENTRALISED MANAGEMENT

74. The workshops identified a number of obstacles to decentralised management:
- Lack of local capacity (skilled labour) / institutional weakness.
 - Inexperience of local level managers in negotiating, discussions and in relation to authorities and donors.
 - The centralisation of decision making that is the norm in most countries.
 - The application of decentralising measures runs the risk of generating isolated processes that may become weakened due to the lack of central political support.
 - Centralised decision making can lead to quicker results.
 - Management that is exclusively locally driven may result in a loss of vision of the overall problem. This may, for example, be especially so where benefits are enjoyed non-locally (as in improvements to downstream water quality) and incentives to the local community undertaking EA management actions are unclear or not immediate.
75. Under decentralised management good relationships and communications with higher authorities often continue to be important for maintaining central political support.
76. Devolution of political authority can be an obstacle to implementing the EA as in Siberut, Indonesia. Here, although the central government endorses the EA the recently formed regional government that administers Siberut does not.

Case
study 27

77. Summary

- *In practice, there are a number of significant capacity and structural **obstacles to decentralised management.***

INTERCONNECTIONS BETWEEN ECOSYSTEMS ARE OFTEN NOT CONSIDERED

78. The workshops noted that the effects of one ecosystem on another (**Principle 3**) was not very well illustrated by the case studies. To some extent the zoning of, for example, Biosphere Reserves does indicate the application of this Principle as zoning implicitly recognises that there are ecological connections between, for example, buffer and core zones. But overall this aspect of the EA may need to be promoted if Decision V/6 is to be widely implemented.
79. A number of factors may contribute to a neglect of inter-ecosystem linkages; these include:
- The tendency for ecosystem managers (as with all people) to have a limited vision, to be only interested in the areas where they act and not to perceive the interactions with neighbouring localities.
 - The traditional focus of conservation efforts on target protected areas even though activities outside target sites may have a significant and damaging impact within the protected area.
 - The site-specific nature of most projects that seek to catalyse or demonstrate best practice in ecosystem management.
 - Understanding inter-ecosystem effects requires long term monitoring of biophysical processes over, in some cases, very large areas. This presents significant practical difficulties.

Case
study 2,
10, 16,
18, 24,
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80. Summary

- The **significance of functional linkages between ecosystems** is often not fully recognised by natural resource managers.

HOW APPROPRIATE IS THE NATIONAL SCALE TO IMPLEMENTATION ?

81. Parties are responsible for implementation of the CBD at the national scale, while also considering transboundary issues and wider regional and global priorities. The first planning and strategy step of most Parties in implementation of the CBD has been the production of NBSAPs. Implementation of NBSAPs requires integration of biodiversity into diverse sectors of the economy and government. The workshops considered that the EA provides an appropriate framework for balancing conservation and development needs at the national level. There is, however, a need for NBSAPs and other policy instruments to be revised so that they incorporate the EA (**Operational Guideline 5**). Furthermore, and importantly, effective linkages need to be made between NBSAPs and frameworks for economic planning so that biodiversity, through the EA, is mainstreamed into development practice. Workshops identified the need for NBSAP guidelines produced by organisations such as IUCN and WRI to be updated to provide guidance on how to integrate the EA into NBSAPs. National workshops were identified as an appropriate action to engage a diversity of stakeholders in integration of the EA into NBSAPs and wider policy areas.

82. Summary

- National workshops may assist Parties as they **integrate the EA into their NBSAPs**.

THE EA IS RELEVANT TO INTERNATIONAL TRADE

83. Global trade is likely to continue to increase rapidly, bringing ever closer connections between consumers and producers in different parts of the world. The production of many commodities that are traded internationally have significant impacts on biological diversity and ecosystem functioning. Local communities can benefit from such trade but often gain little as they do not control the marketing of produce. Participants identified the EA as a potentially appropriate framework for trade regulations that would safeguard the sustainability of productive export systems, distribute environmental costs and benefits equitably and protect biological diversity. It was recognised that World Trade Organisation rules should at least be consistent with the EA.

Case study 26

84. Summary

- The EA may be an appropriate framework for ensuring that **international trade** does not compromise the objectives of the CBD.

TIMESCALES TYPICALLY DIFFER BETWEEN STAKEHOLDERS

85. Politicians, producers, communities, donors, national and local authorities all operate within completely different time scales. Case studies presented at the workshops demonstrated that projects sought to meet the expectations and needs of various stakeholders by having medium and long-term aims (**Principle 8**) but including concrete actions in the short term. Although participants agreed that long-term objectives were central to the EA, there was concern that there is insufficient emphasis in Decision V/6 on the need for the communities involved in delivering the EA to enjoy immediate benefits. Human needs are immediate: sustainable futures are irrelevant to people in need today. Those in need, in general, are often groups that are socially and economically marginalised and who have immediate survival needs completely different from the vision of the technician engaged in delivering the EA. The need to set short-term objectives and goals does not only come from the users of natural resources, but may also respond to the conservation needs of ecosystems or species in a critical condition.

Case study 1, 3, 5, 8, 11, 12, 14, 16, 17, 19, 21, 23,

86. Of great concern to all participants was the short-term nature of projects. Too often projects fail to find long term solutions to the problems they seek to address. The limitations of short-term projects can be at least partially overcome in practice by:

- The project being economically sustainable in the medium to long term following short-term start up funding. This requires the development of realistic exit strategies, for example, a mechanism to continue catalysing the holistic approach.
- The integration of pilot projects of short and medium term duration in permanent Programmes.
- The acceptance and diffusion of ideas among local participants.
- A realistic project exit strategy that provides for continuity of activities initiated by the project.

87. Drawbacks with long-term objectives include:

- Long-term commitments are not very attractive for governments.
- Long-term objectives do not relate to the expectations of the people, who look for benefits in the short term.
- The long-term time scales do not relate to the immediate needs, neither those of development nor of conservation.

88. Summary

- *The different **time scales of various stakeholders** probably cannot be changed, but they must be managed if the EA is to be successfully implemented.*
- ***Immediate incentives** are needed if long-term aims are to be delivered.*
- ***Projects** are typically **short term** but there are strategies for overcoming the limitations of short term funding.*
- ***Long term objectives have drawbacks** for some stakeholders who are motivated by immediate results.*
- ***Exit strategies** need to be developed which ensure continuation of the EA.*

SCIENTIFIC UNCERTAINTY IS ONE REASON WHY ADAPTIVE
MANAGEMENT IS NEEDED

89. The reality of changing and dynamic ecosystems was recognised by many participants although was perhaps not widely examined in the case studies. In addition, the great uncertainty about even fundamental ecological questions was highlighted. For example, determination of the carrying capacity of many ecosystems (e.g. marine, savanna and tropical forests) is problematic and controversial, an uncertainty that presents difficulties to managers seeking to manage ecosystems within their functional limits (**Principle 6**). This uncertainty demonstrates the need for adaptive management (**Operational Guideline 3**). Any adaptive management (or "learning-by-doing") system needs to include strong links between managers and the latest scientific expertise on ecosystem functioning and processes. The effectiveness of the link between managers and ecosystem scientists is dependent in part on the ability of the latter to translate science into practical guidelines and tools.

90. Summary

- *There is often **scientific uncertainty** about factors that determine ecosystem functioning, hence **management should be adaptive** to lessons learned in the field and responsive to ongoing advances in scientific understanding.*

ADAPTIVE MANAGEMENT – A NEW SCIENCE?

91. Adaptive management was recognised as a science that was new to many stakeholders. Those engaged in ecosystem management therefore need to ensure they have sufficient

training in this area so that they can respond to inevitable changes to both the physical and socio-economic environment (**Principle 9**). Management of projects needs to be able to adapt to political and financial uncertainties, as well as to, for example, climate variation. Organisations implementing the EA need to adopt flexible planning systems that are centred on objectives, not activities.

92. Summary

- *Training is needed to build understanding and ability in **adaptive management** as it is a new approach for many organisations and individuals an*

MONITORING IS VITAL FOR ADAPTIVE MANAGEMENT

93. Monitoring is the process that underpins adaptive management but depends on adequate feedback mechanisms without which managers cannot respond to change. Deciding which indicators need to be chosen for monitoring is crucial. Faced with the widespread situation of limited financial resources and personnel, the monitoring of multiple indicators is often a practical impossibility. It is therefore essential to select those key indicators that will allow the implementation of an adaptive management model. It was noted that indicators of ecosystem functioning and sustainable use should be developed with communities so that the indicators are designed using any relevant indigenous knowledge and, importantly, the communities have a direct sense of responsibility over the quality and productivity of their environment. Overall, the workshops were concerned that few case studies gave much guidance on how to successfully select indicators, undertake monitoring and revise activities in light of new information.

94. Summary

- ***Monitoring** of appropriate indicators is vital for adaptive management yet guidelines and case studies on this theme are lacking.*

E. Benefit sharing and incentives

BENEFIT SHARING – WHAT IS NEW UNDER THE EA?

95. For some participants, the idea of benefit sharing was not new as it was identified as another term for land ownership and usage reforms. But discussions demonstrated that equitable sharing under the EA could potentially be quite different. For example, benefit distribution under the EA could include a tourist operator paying compensation to fishermen to stop dynamite fishing, thereby preserving a coral reef for touristic enjoyment (and the long term benefit of the fishing community).

96. The sharing of costs and benefits across scales is another distinct feature of benefit sharing under the EA. Such benefit sharing mechanisms also have the potential for involving disparate stakeholders who do not typically identify themselves as having common interests, as in the payment of benefits to those who ensure or enhance ecosystem services. This could be appropriate, for example, where downstream fishing communities benefit from upstream land management effort within a catchment. In this scenario, the upstream land managers could be paid for the services they provide in the form of cleaner, more productive and more biologically diverse water.

97. Benefit sharing under the EA need not require a financial incentive nor be prescriptive. Indeed, statutes, regulatory or prescriptive approaches are often the most difficult to enforce. Non-prescriptive solutions based on the active support of stakeholders invariably carry the greatest chance of success⁴. In the above example, it may not be necessary to

⁴ See the Tamar 2000 case study in Maltby, E. (1999) *Ecosystem approach, from principles to practice*.

pay the landowner to undertake measures that improve water quality if those measures result in benefits to the landowner. For example, fencing and wise use of fertiliser may reduce costs for the landowner while also improving the biological diversity of catchment water and revenue from fishing.

98. The workshops expressed the need for guidelines on benefit sharing and incentives under the EA and identified the need for joint implementation of Decision V/6 and Decision V/15 on Incentive measures.

99. **Summary**

- *There are potentially many **innovative approaches to benefit sharing** under the EA and further guidance on this would be appropriate.*
- **Benefit sharing need not involve financial payments** as management based on ecological principles can often prove cost effective.
- **Non-prescriptive solutions** may carry the greatest chance of successful implementation of the EA.

SHARING COSTS AND BENEFITS GLOBALLY

100. **Principle 4** calls for costs and benefits to be internalised “in the given ecosystem to the extent feasible”. However, in some scenarios the costs and benefits can only be considered from a global perspective. For example, land managers who act to reduce emissions of greenhouse gases could, under the EA, receive payment from those who enjoy this enhancement to ecosystem services. As the benefits of a lower abundance of greenhouse gases are felt globally, it is reasonable to expect that the costs should also be applied globally. Ideally perhaps, a financial mechanism would not be necessary, as the land manager would see a direct economic benefit from improved management – for example, soil fertility improvements that result from low tillage (and lower CO₂ emissions) management. Whereas the motivation for interventions under the EA is likely often to be economic the goal should be enhanced biodiversity and long-term productivity benefits. Parties could usefully examine how the EA under the CBD could be a framework sharing costs and benefits under the UNFCCC Kyoto Protocol.

101. **Summary**

- *It is **unlikely that costs and benefits can be internalised** within ecosystems in every case.*

**MEETING WIDER SOCIO-ECONOMIC NEEDS CAN BE ESSENTIAL
BEFORE PEOPLE WILL BECOME ENGAGED IN ACTIVITIES IN SUPPORT
OF THE CBD.**

102. Communities typically require immediate benefits from any additional activities they may undertake under the EA, even if long term benefits to biological diversity and sustainable human social and economic welfare also result. Additionally, one case study reported the need for wider socio-economic priorities such as medical facilities, transport links and schools to be met before communities were willing to be actively involved in a project. This situation may be most likely where the EA activity involves a vision over a wide area such as a river basin. It is not realistic to expect local communities or stakeholders to be willing participants in EA activities unless they identify with and benefit from the larger scale vision. When the EA is applied at such a large scale not all stakeholders necessarily benefit as immediately or significantly as others. The workshops highlighted the need for benefits to go directly to those involved in delivering the EA.

Case
study 1

103. Summary

- *Delivering the CBD objectives through the EA may, in some circumstances, require **socio-economic priorities** to be addressed first.*

LACK OF EVALUATION AND ASSESSMENT OF ECOSYSTEM SERVICES

104. The workshops recognised that **Operational Guideline 2** and **Principle 5** are important for the delivery of benefits under the EA but found that two factors hindered their application:

1. Lack of scientific assessment and quantification of the services provided by most ecosystems.
2. The absence of generally agreed mechanisms and procedures for the valuation of ecosystem services.

105. A sufficient understanding and assessment of the functioning of most ecosystems requires significant further research efforts. A full understanding is unlikely to be possible in most instances hence it is necessary to proceed with limited knowledge. Modelling of ecosystem functioning can predict the likely effects of management decisions and is a practical and viable solution where field data are lacking. However, even when functional aspects of an ecosystem are well understood there is currently an absence of widely agreed procedures or guidelines for evaluating ecosystem services.

106. The workshops agreed that it is important that those responsible for the maintenance and management services should benefit from these functions.

107. Summary

- *Standardising procedures for evaluating ecosystem services under the CBD may significantly increase the impact of the EA.*

REMOVAL OF PERVERSE INCENTIVES IS A PRIORITY

108. Participants recognised that there is often a need to promote awareness and appreciation of biological diversity and its functions so that societal choices (**Principle 1**) are made by balancing the value of biological diversity with economic factors (**Principle 4**). Even when society does value biological diversity, management of biological diversity must still meet economic needs and aspirations. The workshops suggested that there is great scope to redirect perverse incentives so that economic objectives are met while threats to biological diversity are reduced. For example, perverse incentives such as tax measures are currently damaging biological diversity by promoting recreational facilities such as golf courses in areas such as tropical forests that are rich in biological diversity and deliver important ecological services. Alternatively and at the same cost, incentives could be used to support alternative recreational facilities and businesses that did not impact on biological diversity and ecosystem functioning and had the same or greater economic benefits. The removal of perverse incentives can therefore help to achieve a fairer balance between economic and biological diversity objectives.

109. Another example of an incentive that can be perverse is subsidies to the cost of fertilisers, pesticides and herbicides. For example, field studies demonstrate that fertiliser use can be cut dramatically in many farming systems with benefits to the farmer (reduced costs) and biological diversity (reduced eutrophication of catchment water). In Asia, reduction in pesticide use has resulted in increased rice yields. These results are most likely to be achieved when incentive reduction or abolition is coupled with awareness building so that farmers choose to adopt an ecological perspective in their land management.

110. Summary

- The **removal of perverse incentives** is a priority if societal choice is to appropriately balance the economic needs and aspirations of people with the conservation and sustainable use of biological diversity.

F. Information management for decision making

EXISTING SCIENTIFIC KNOWLEDGE NEEDS TO BE MOBILISED

111. Much scientific information that is relevant to the conservation objectives of the EA exists in many countries but is unavailable, or needs interpretation and visualisation. Problems related to information availability refer both to the existence of information and to its accessibility. Information is not always available in an appropriate manner. For example, often a significant number of biological and ecological studies and records exist, for example in libraries, ministries and herbaria, but this information is not readily accessible to those setting conservation priorities. Under the EA it is vital that this existing information is made readily accessible, ideally in a collated and processed form that non-expert decision-makers and planners can readily interrogate.

112. Summary

- *Scientific and socio-economic **knowledge** and decision-relevant data, for example consultants' reports and information held in ministries, **should be made widely available and shared among ministries and the wider public.***

INTEGRATING LOCAL AND SCIENTIFIC KNOWLEDGE TO CREATE DECISION SUPPORT TOOLS CAN HELP NON-SPECIALISTS INTERPRET AND VISUALISE DIVERSE DATA

113. Generally, the importance of incorporating local knowledge (**Principles 11 & 12**) was recognised by the workshops. However, it was also acknowledged that little has been achieved in this area. It was acknowledged that some scientists are reluctant to integrate local knowledge with scientific/technical information.

114. The relevance of local knowledge is much more apparent when it deals with issues linked to the use of resources rather than conservation, as local players are generally more focused on the use and exploitation of a resource. However, much local knowledge – such as migratory characteristics of species - is also highly relevant to conservation. It is important that those who contribute indigenous knowledge to EA knowledge bases need to be appropriately rewarded.

115. The workshops recognised that decision making under the EA requires a high quantity of diverse information (e.g. biophysical (many types), economic, sociological, political) to be evaluated by a wide range of stakeholders, each with distinct experiences and expertise. Few people have the multi-disciplinary expertise required to make informed decisions under the EA. Decision support tools can help users by making information available graphically and, if linked to a suitable knowledge base, by guiding the non-expert user through a series of choices to arrive at a decision informed by the best expert knowledge. Knowledge bases that incorporate both local and multidisciplinary scientific knowledge therefore need to be constructed to address each identified problem. With a suitable knowledge base, decision support tools can assist all stakeholders in both day-to-day management and – through scenario visualisation - in predicting the likely outcome of different management decisions taken under the EA.

116. Summary

- *There is a need for close cooperation between holders of **indigenous and scientific knowledge** when constructing knowledge bases to address biodiversity problems.*
- ***Knowledge bases** that integrate scientific and local knowledge can greatly assist decision making under the EA.*
- ***Decision support tools** that make use of problem-specific and interdisciplinary knowledge bases can help all stakeholders make appropriate management decisions under the EA.*

G. Structural and inter-sectoral issues

IS IMPLEMENTATION OF THE EA POSSIBLE WITH EXISTING DECISION-MAKING STRUCTURES?

117. Implementation of Decision V/6 requires perhaps unprecedented cooperation between the sectors of government. Consequently, workshop participants identified the sectoral structure of government as a major obstacle to implementation of the EA (**Operational Guideline 5**). The workshops thought that the mandates of government and non-governmental institutions typically reflect a fragmentation of roles, of supporting legislation and of resource allocations. This disjointed approach to decision making can cause confusion among communities as each institution or sector typically has its own priorities, message and associated jargon.

118. Changing the structures of government was thought to be impractical in most cases. Harmonisation of policies, institutional mandates and laws to remove inconsistencies and obstacles to the EA are probably more feasible and therefore likely to have a more rapid impact than far-reaching institutional changes. Such efforts are likely to be facilitated if, as in Colombia, there are environmentally trained staff in a range of government ministries. In addition, participants considered that existing or new high level inter-ministerial committees or working groups were appropriate for forming the shared vision needed to implement the EA. Other possible structures, perhaps most relevant in countries that are reviewing or newly specifying the roles of government bodies, include having an office responsible for the EA that is answerable to the Prime Minister or Head of State.

Case study 13

119. Whereas high level institutions may be vital for ensuring policy harmonisation, the value of intersectoral coordination may best be demonstrated at the small-scale using existing or newly created community empowering organisations. Working examples of successful cooperation can then be popularised more widely by central bodies.

Case study 1, 5, 12, 16, 19, 21, -- --

120. Summary

- *It is unlikely that new, integrated decision making structures can be formed in most countries. **Policies, laws and institutional mandates should therefore be harmonised as a priority so that they enable implementation of the EA.***

MORE ACTIVE IMPLEMENTATION OF INTERNATIONAL CONVENTIONS CAN CATALYSE APPLICATION OF THE EA

121. Many of the international conventions on the environment have objectives and strategies that are largely consistent with the EA. Parties to the Convention on Wetlands are, for example, required to implement "wise use" principles (Article 3.1). However, the workshops considered that the implementation of international conventions is often constrained by the failure of Governments to allocate the necessary capacity and budget needed to promote and enable implementation. There is also the need in many countries for significantly greater cooperation between ministries charged with implementing the various conventions.

122. Wider ratification of conventions such as CCD, FCCC and the Convention on Wetlands can help to harmonise policies across national boundaries in a manner consistent with the

EA. For example, a dispute of grazing lands between neighbouring countries may be more easily resolved if both have a common environmental commitment confirmed by ratification of the relevant international agreement(s).

123. Summary

- *The EA is consistent with the objectives of **other international environmental agreements**. The synergy between conventions can be used to promote their collective implementation.*

ROLE OF CBD FOCAL POINTS

124. The current position of CBD National Focal Points was viewed to be insufficiently strong. Participants discussed how strengthening the role of national CBD Focal Points could facilitate application of the EA. One option proposed was that the office of the Focal Point should be supported by a technically proficient secretariat so that the Focal Point has the information and resources necessary to promote the delivery of the CBD objectives through integration of the EA in decision making in all relevant sectors. A number of suggested roles for Focal Points were identified (Table 7).

SUGGESTED RESPONSIBILITIES FOR AUTHORITIES CHARGED WITH NATIONAL IMPLEMENTATION OF THE EA	
1.	Encourage action on the EA among all sectors of government;
2.	Catalyse the development of appropriate financial and institutional mechanisms to ensure that projects are sustainable once external funding ceases;
3.	Secure the means of financing project activities in collaboration with the CBD Secretariat, GEF and other partners;
4.	Advise on the priorities for harmonisation of legislation, laws and institutional mandates;
5.	Advise Government on the priorities for strengthening positive and reducing negative incentives;
6.	Identify conservation priorities;
7.	Co-ordinate and facilitate national dialogues to review biodiversity programmes, identify opportunities, and support projects and activities;
8.	Develop a national database of experts who can support CBD implementation and liaise with collators of appropriate regional and international databases;
9.	Make the case for government interventions in activities that damage a country's fulfilment of CBD objectives;
10.	Recommend priorities for the development of local capacity for implementation of CBD / EA.

Table 7
CBD Focal Points

Suggested responsibilities for an EA coordinating authority /

125. Summary

- *In many countries, implementation of Decision V/6 is likely to benefit significantly if the **capacity of CBD National Focal Points** is increased.*

H. The EA and other conservation strategies

SHOULD THE EA BE USED INSTEAD OF OR ALONGSIDE OTHER APPROACHES TO CONSERVATION ?

126. Participants expressed the need for guidance on how the EA relates, in practice, to other (more traditional) conservation strategies. A number of questions were identified:
- When are other approaches more appropriate?
 - Is the EA a strategy that complements or competes with other conservation approaches?
 - When are protected areas appropriate within the EA?
 - Can and should protected areas be planned as part of a spatially more extensive, EA framework?
 - Is the EA saying that there should be a balance between conservation, sustainable use and equitable sharing of benefits at one or more of the local / provincial / national / regional / global scales?
 - Should each protected area seek a balance between use, benefit sharing and conservation?
 - Can protection of one charismatic species (e.g. *Gorilla gorilla*) preserve an ecosystem and its vital services?
127. **Summary**
- *Clear guidance is needed on how the EA relates to other approaches to conservation.*

THE EA AND PROTECTED AREAS

128. The relationship of the EA to protected areas was of particular interest to participants. This was due to the high proportion of conservation professionals engaged in the workshops and the traditional importance of protected areas to conservation. It was considered that protected areas should be integrated into the EA framework, as called for by CBD Decision IV/7 on forest biological diversity. However, a particular feature of the EA is that its implementation is not limited to protected areas and indeed specific application outside such zones may be its greatest potential advantage. It was expected that all land (or water) managed within an EA framework should benefit from a greater biological diversity and sustainable use value even if it is not within a protected area. Participants noted that protected area managers had great control over activities and that no such control would exist under the EA framework. Hence the importance of acceptable, non-prescriptive measures to promote action under the EA.

129. The Biosphere Reserve case studies presented at the workshops demonstrate that EA Principles and Operational Guidance can be highly relevant to the successful operation of some protected areas, as conservation often cannot be delivered without recognising and meeting human needs and rights. However, the greatest scope for applying the EA is probably in the 90% of the planet that lies outside of protected areas for it is here that the challenge of conserving, sustainably using and equitably sharing benefits is most acute.

Case study 2,
10, 15,
18, 24

130. Summary

- *Protected areas can be an integral part of the EA.*
- *The greatest scope for the EA may be its application outside protected areas.*

THE EA AND CHARISMATIC SPECIES

In situ conservation of charismatic species such as tigers, pandas and elephants typically requires the balancing of habitat preservation needs of the target species with the day-to-day needs of human populations. Traditional protected areas, although essential, are insufficient by

Using the Ecosystem Approach to implement the CBD.

A global synthesis report drawing lessons from three regional pathfinder workshops.

R. D. Smith and E. Maltby



themselves to conserve these species as the vast areas typically required to preserve viable populations often encompass large human populations. The EA is a particularly appropriate framework for achieving *in situ* conservation over wide areas as it aims to find the appropriate balance between human needs and conservation.

Summary

- *Guidelines are needed on how to use the EA to achieve in situ **conservation of charismatic and other species over wide areas**. Such guidelines should draw on case studies that would include Biosphere Reserves and other protected areas with (sometimes high) human populations.*

IV. SOME CONCLUDING REMARKS

131. What is distinctive about the Ecosystem Approach?

- The EA provides a framework whereby an acceptable balance can be obtained of the three key objectives of the CBD.
- People are placed at the heart of biodiversity management.
- Emphasis is on capturing and optimising the functional benefits of ecosystems.
- The importance of biodiversity management beyond the limits of protected areas is emphasised whilst protected areas are recognised as still being vitally important for conservation.
- The flexibility of the approach with respect to scale and purpose provides a versatile framework for operationalisation.

132. What have we learnt from the pathfinder workshops?

(a) Overview

- There is still inconsistency in understanding of the meaning of the term "EA".
- The overall concept the EA represents is already embraced by many practitioners and organisations and applied to a varied extent in different conservation, development and natural resource management contexts.
- Case studies provide a range of valuable experience for others embarking on implementation of the EA.
- It is essential to recognise the importance of regional context, different societal priorities and cultural perspectives in application of the EA.
- Transboundary biodiversity problems can be addressed using the EA and regional political structures.

(b) Gaps in knowledge and understanding

- There are deficiencies in the technical understanding of ecosystem functioning.
- There are inadequate exchanges of relevant information between and among institutes and responsible agencies.
- Capacity is commonly insufficient to implement the EA as a key cross-cutting framework.
- There is limited understanding of the EA at effective decision making levels.

(c) The main constraints to effective implementation

- Ineffective stakeholder participation in planning and management.
- Inconsistent use of terminology and definitions.
- The lack of capacity for decentralised and integrated management.
- Insufficient institutional cooperation and capacity.
- Lack of dedicated organisations able to support delivery of the EA.
- Overriding influence of perverse incentives and conflicting political priorities.

133. How can the EA help further in the implementation of the CBD?

- The EA is a unifying tool that is appropriate for mainstreaming the CBD into the wider policy agenda.
- It codifies within the Convention what many Parties, institutions and agencies are already attempting to do with respect to project implementation and related policy obligations at national, supranational and international levels.
- The EA can be used to break down the sectoral divisions between ecology and economics, and address biodiversity conservation as an intricately interrelated aspect of human welfare.
- The EA can help policy makers appreciate the importance of the vital ecosystem services that depend on biodiversity.
- Successful implementation of the EA has the potential to support the vision of civil society and can assist considerably the political process in realising this.
- The raised profile of benefit sharing implicit in operationalisation of the EA can assist in resolving the conflicts between different sectoral groups.
- Relevance to other conventions such as Ramsar and CCD can reinforce the delivery

mechanisms of all such treaties.

- The EA underlines the importance of inter- and intra-sectoral cooperation which is essential for the better management of natural resources.
- Recognition of the need to combine both bottom-up and top-down mechanisms for operationalisation of the EA can help facilitate achievement of the CBD objectives.
- Application of the EA can help secure the future of protected areas while extending biodiversity management over the wider landscape.

134. What should be the next steps?

- Facilitate access to the regional case studies and workshop reports so that Parties can share experience and knowledge.
- Promote the short definition of the EA (see paragraph 2) and its relevance to implementation of wide-ranging environmental legislation and policy instruments in addition to the CBD.
- Encourage Parties to develop new pilot projects and case studies that are based from the outset on the EA and make available the operational experiences (both positive and negative) using, where possible, the CHM and other appropriate avenues.
- Examine ways in which the EA can be more effectively integrated within conservation strategies at national and other scales through, for example, NBSAPs.
- Distil problem-specific guidance for the application of the principles of the EA.
- Use the requirements of the EA to identify the particular and specific technical and other capacity building needs the Parties need to support implementation.
- Determine the ways in which professional expertise from the non-conservation community including industry, trade and finance sectors can be more fully embraced into operationalisation of the EA.

V. RECOMMENDATIONS: taking the EA from concept to action

RECOMMENDATIONS	TARGET ORGANISATION(S)					
	Parties	NGOs	CBD Secretariat & SBSTTA	Education and research institutions	International organisations	Funding bodies
Building awareness						
Parties and others should use the case studies presented at the pathfinder workshops for illustration of the EA.	*	*			*	*
Parties and others should carry out pilot projects and additional case studies to further illustrate the flexibility of the EA and the diversity of problems the approach can address.	*	*		*	*	*
Governments should use the EA as the basis for mainstreaming the CBD objectives into policy making.	*					
Parties and others should support mainstreaming of the EA/CBD into policy making (and integration of the EA into NBSAPs) by: (1) awareness raising among non-conservation sector professionals and (2) national workshops.	*	*	*	*	*	
Interested organisations should communicate the EA in short, easy-to-grasp phrases to both non-specialist policy makers and environmental specialists.		*		*	*	
Interested organisations should help raise awareness of Decision V/6 by referring to the decision and definition of EA in their related work.		*		*	*	*
All interested bodies should build awareness of the significance of ecosystem functioning to human social and economic welfare.				*	*	
Parties and others should consider identifying / developing regional centres of expertise that are able to take the lead in building awareness and capacity building for the EA.	*		*	*		*
Interested community members should be empowered to raise awareness and understanding of the EA among their community.	*	*				
Overcoming constraints / seizing opportunities						
Parties should harmonise policies, laws and financial mechanisms to promote implementation of the EA.	*					
Procedures for evaluating ecosystem services should be agreed by Parties.	*			*		*
Existing inter-sectoral structures, such as inter-ministerial committees, should adopt responsibility for mainstreaming of the EA into cross-sectoral decision-making.	*					
Parties should note that the EA is consistent with the objectives of other international environmental agreements.	*	*			*	*
Appropriate regional protocols and administrative structures should be used to catalyse implementation of the EA, especially across borders.	*				*	
Rather than developing new institutions and legislation, governments should revise existing legislation, laws, taxation and policies to ensure that they promote implementation of the EA.	*					
Relevant bodies should strive to achieve a common vision among all stakeholders when using the EA.	*	*			*	
Projects and other actions in support of the CBD should consider engaging communities by direct and visible coupling of projects with development efforts that deliver socio-economic improvements.	*	*			*	*
Parties and relevant bodies should use the EA framework to ensure that international trade does not conflict with CBD objectives.	*		*		*	
NGOs and research institutions should develop indicators of ecosystem functioning and sustainable with local communities.		*		*		

	TARGET ORGANISATION(S)					
	Parties	NGOs	CBD Secretariat & SBSTTA	Education and research institutions	International organisations	Funding bodies
RECOMMENDATIONS (CONTINUED)						
Priority actions						
Research institutions and others should develop problem-specific, practical guidelines that are relevant at the field level to help Parties and others to use the EA.			*	*	*	
Those using the EA should use both bottom-up and top-down strategies to define the most appropriate scale for management for each particular problem.	*	*	*	*	*	
Perverse economic incentives should be removed.	*					
Professionals from non-conservation sectors of the economy and society (including industry, agriculture and finance) should be made aware of the EA.	*	*		*	*	*
Easy-to-use decision support tools that integrate multidisciplinary knowledge (including from indigenous peoples) should be developed and disseminated.				*	*	*
Existing information relevant to decision making under the EA should be made available and accessible to non-specialists.	*			*		*
Guidelines and case studies on benefit sharing should be developed and disseminated.			*		*	
The physical and socio-economic aspects of ecosystem functioning should be researched as a priority.				*		*
Capacity building priorities						
Parties and funding agencies should significantly enhance the capacity and support for National CBD Focal Points so they can successfully promote and facilitate implementation of the EA.	*	*			*	*
Regional institutions such as Universities should develop training in modules relevant to the technical and management skills required to implement the EA.				*		
Capacity building should be long-lasting and not limited to project funding cycles.				*	*	*
Training institutes and employers should provide education and in-job training in adaptive management.				*		
Governments and others should address the chronic lack of skilled labour and resources in the region by considering the specific capacity building needs for the EA identified in this report.	*			*	*	*
Other approaches						
Interested organisations should produce clear guidelines on how the EA relates to other conservation and natural resource management strategies.			*	*	*	

VI. Appendix 1: A selection of case study summaries

Case Study 1

SOME EXPERIENCES ON THE APPLICATION OF THE ECOSYSTEM APPROACH: THE CASE OF THE ZAMBEZI BASIN WETLANDS CONSERVATION AND RESOURCE UTILIZATION PROJECT

PROBLEM STATEMENT

The project aimed to conserve the Zambezi Basin wetland ecosystems while facilitating their sustainable use.

DESCRIPTION

An integrated, multi-national approach to management was promoted to address the ecological degradation that has resulted from the unsustainable use of wetland resources. There were two main types of activity: (1) wetland conservation and (2) community well being. Achievements were: (1) Zambezi basin biodiversity assessment – this identified priorities and provided a baseline inventory; introduction of resource-based management regimes – these encouraged resource use to be more sustainable; economic evaluation of wetland resources – this has helped raise local awareness and develop regional policies. (2) Health, education, food security, income and cultural values were enhanced. The project found it necessary to first tackle community well being and try to meet the immediate needs of people before addressing the conservation goals of the project.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- The project found it necessary to focus first on enhancing socio-economic conditions and sustainable use before turning to conservation and use.
- Economic valuations of goods and services were undertaken at regional and local scales.
- The immediate delivery of benefits to the people responsible for conservation and sustainable use is vital.
- Maintaining ecosystem functioning across the basin (and the value of products locally) was a priority objective.
- A multi-scale approach was taken: the economic valuation of goods, services and biodiversity were undertaken at the local and basin levels, and activities were targeted at the local (village-level institutions established and local bylaws passed) and transboundary scales.
- Improvements to the conservation and ecosystem service status of site studies were not fully evident within the 5-year project period.
- The project aimed to make use of multidisciplinary scientific and traditional knowledge.
- The following Principles were emphasised: 1, 2, 4, 5, 7, 11 & 12.
- CBD Thematic Area: Inland Waters.
- CBD Cross-cutting issues: Incentives, Sustainable Use & NBSAPs.

LESSONS LEARNED

- Conservation and sustainable use objectives cannot be achieved unless education, health, gender equity, transport and incomes and human wellbeing requirements are first improved
- Local-level economic resource valuation helped build awareness of the need for measures to ensure the sustainable use of the resource base.
- Popular media (radio plays and songs) using local community artists were important for building awareness of the wetland values and sustainable use.
- Regional economic valuation of resources assisted in integrated transboundary planning within the Basin.
- The biodiversity study report needs to be packaged into appropriate formats for the different stakeholders such as planners, policy-makers and local communities for it to be of more practical use

Case Study 3

THE ECOSYSTEM APPROACH UNDER THE CBD FOR COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT: ISSUES FOR CONSIDERATION FOR THE CAMPFIRE PROGRAMME IN ZIMBABWE

PROBLEM STATEMENT

CAMPFIRE (Communal Areas Management Programme for Indigenous Resources) is an example of Community Based Natural Resource Management (CBNRM) that aims to promote the sustainable use of natural resources, especially wildlife, for socio-economic development.

DESCRIPTION

In the semi-arid and arid regions of Zimbabwe, home to most of the population, communities were found to have no vested interest in conserving wildlife, as they have become increasingly alienated from its management and use. CAMPFIRE seeks to overcome these obstacles by demonstrating the livelihood and conservation benefits that result when the management and use of natural resources is decentralised. The focus has been wildlife management in communal areas, particularly those adjacent to national parks, where people and animals are in conflict for resources. Wildlife management and use has the potential to bring quick economic returns in agriculturally marginal areas.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- By recognising that local populations need to experience real benefits if protected areas are to succeed in their conservation goals, this case illustrates efforts to simultaneously achieve all three of the CBD objectives. However, the focus is on sustainable use to support rural social and economic welfare.
- Design and expansion of CAMPFIRE has been in response to the expressed needs of the participating population.
- The project has identified a number of issues relating to defining the lowest *appropriate* level of management. Questions included: how should the unit of management be defined? Is it feasible to have different levels of devolution in one country? There is also realisation that government will need to retain the right to intervene in situations where actions by some communities can negatively impact on others, e.g. strategic resources and threatened species. The feasibility of devolving the management of wildlife from the district level to the ward and/or village levels is being investigated.
- Institutional problems concerning two government agencies have led to the neglect of key strategic and policy issues.
- The only evaluation of goods and services has been of wildlife use. Nonetheless, economic evaluation has allowed the long-term value of wildlife to communities to be contrasted with agriculture, cultural and political factors, the programmes of donors and the demands of safari activities.
- Adaptive management is seen to be important but the necessary ecological, social and economic monitoring and indicators have yet to be systematically applied.
- Principles relating to ecosystem functioning and ecological science (P 3, 5 & 6) were not addressed.
- CBD Thematic Area: Dry and sub-humid lands. CBD Cross-cutting issues: Sustainable Use, Incentives, Benefit Sharing & NBSAPs.

LESSONS LEARNED

- Wildlife protection can best be ensured when producer communities are given an economic and management stake in the wildlife resource.
- Administrative and institutional structures were needed.
- Communities can benefit more from wildlife than from agriculture in arid and semi-arid lands.
- Collaboration with a diversity of institutions has been key to success.

Case Study 4

THE ECOSYSTEMS APPROACH TO BIODIVERSITY CONSERVATION: EXPERIENCES OF THE BIODIVERSITY FOUNDATION FOR AFRICA AND THE ZAMBEZI SOCIETY

PROBLEM STATEMENT

The project was aimed at making available biodiversity information that is site specific, multidisciplinary and covering the full range of biological groups useful for effective monitoring of the impacts of developments on biodiversity and development and implementation of biodiversity conservation measures for the Zambezi Basin wetlands.

DESCRIPTION

The project component approach was to build on available biodiversity information through literature review and field biological surveys to gather new information. This was followed by analysis and synthesis of this information and identification of information gaps for filling up. The collected scientific information was then packaged into concise, focused and digestible formats for policymakers, decision-makers, planners and local communities at all relevant levels. The availability of scientific biodiversity information in the appropriate formats is useful and forms an important database for improved biodiversity conservation in the wetlands of the Zambezi Basin. The projects specifically provided recommendations on the important species and priority areas for biodiversity conservation within the Zambezi Basin Wetlands, recommendations for development agencies to ensure conservation of biodiversity and wilderness values, increased knowledge on the biodiversity of the Zambezi Basin and facilitated its use in planning processes within the Basin.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/16)

- The projects found it necessary to review the existing information before undertaking field surveys to collect new biodiversity information
- The projects made use of all relevant fields of knowledge and expertise to collect, analyse, synthesis and package information appropriate for different users
- The project recognised the need to operate at appropriate scales that were manageable and as such operate at site specific scales of a larger ecosystem, according to available capacities.
- The projects recognise the need to provide ecosystem managers with appropriate and scientifically correct information for them to make informed management decisions.
- The projects emphasise the need for recommended conservation actions to be based on as good a multidisciplinary understanding as possible of the status of the species and ecosystems to be conserved
- The following Ecosystem Principles were emphasized: 3, 5, 6, 7, 9, and 10.
- CBD Thematic Areas: Inland waters, Dry and Sub-humid lands,
- CBD Cross-cutting issues: Sustainable use, impact assessment.

LESSONS LEARNED

- Effective conservation of ecosystems should involve looking at not just a single species but all species that occur. It is however, important that particular key species within an ecosystem are identified for which conservation actions must be gathered while recognising the functional relationships in the ecosystem
- Conservation with or through communities needs to work at the pace of those communities and not the pace of outsiders such as implementing institutions, donors or other externally determined deadlines.
- It is important to have a reliable and functioning monitoring system to provide databases for determining important management thresholds such as establishing a balance between conservation and use of biodiversity resources as conservation should not be solely for the sake of conservation for sustaining human social and economic welfare

Case Study 5

SUSTAINABLE MANAGEMENT OF INDIGENOUS FORESTS IN MALAWI: THE CASE OF MWANZA EAST

PROBLEM STATEMENT

The project addressed the problem of deforestation of Miombo woodland in a catchment of the river Shire, one of Malawi's major rivers. The area has experienced a rapid conversion of forest to agricultural land following the construction of a main road. The remaining forest is facing greater pressure from humans, livestock and wildlife.

DESCRIPTION

Five approaches have been used to reduce deforestation: (1) Involving local communities in awareness campaigns and training in improved forest management. These have benefited from local knowledge of forest management and establishment. (2) Integration of women and other marginalised groups in forest resource management. Women suffer most as a result of declining availability of firewood and the drying up of streams due to siltation. (3) Empowerment of communities through the formation of various clubs and committees. Committees were needed to administer the management of forest resources because awareness and training were found to be insufficient to address the problem of deforestation. (4) Control of illegal timber, charcoal and fuelwood use by bylaws. The licensing system designed to control the harvesting of trees has been ineffective hence the project developed bylaws that put limits on the use of forest resources by communities. (5) Harvesting and marketing of non-timber forest products. The project encouraged the diversification of forest product use by supporting the formation of groups to carry out management, utilisation and marketing. As a result of all the above efforts, communities are managing greater areas of forest, illegal harvesting of wood is being reduced, income generating activities have increased and diversified, and communities are actively involved in forest management.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- The project has had some success in simultaneously implementing each of the objectives of the CBD. For example, conservation and sustainable use were balanced and the distribution of forest benefits made more equitable by adding value to sustainably harvested forest products (e.g. fruit juices) and successfully marketing them in urban areas.
- Societal choice – the setting of priorities by local communities was vital for the success of the project; this identified the need and potential for income generation.
- Goods, both timber and non-timber, were identified. Sustainably harvested non-traditional forest products replaced timber and charcoal as the preferred products.
- The success of the project in changing peoples' attitudes towards natural resources results from the local involvement of diverse stakeholders including: churches, research institutions, NGO's, business and government departments.
- Relevant CBD thematic area: Forest Biological Diversity. Relevant CBD cross cutting issues: Benefit Sharing, Indigenous and Local Communities and Sustainable Use.
- The project did not: (1) use or enhance knowledge of ecosystem functional relationships and processes (although the importance of these were acknowledged); or (2) use or test adaptive management.

LESSONS LEARNED

- The activities and structures developed by the project can only be judged to be a success if they survive in the longer term. Continuity of project-inspired activities will require further empowerment and strengthening of institutions at the village-level.
- Obstacles to the success of the project included: 1) insecurity of tenure over customary resources; (2) overharvesting NTFP harvesting methods; (3) insufficient community empowerment to prevent illegal forest use.
- The project needs to be expanded more widely in the catchment if the improvements to forest condition are to have a positive impact on the river.
- Focus on the value of individual species (and neglect of the function of the species) has led over-harvesting of some species and unknown ecological effects.

Case Study 6 EAST AFRICAN MARINE ECOREGION PROJECT

PROBLEM STATEMENT

The overall goal of the project is to maintain a well functioning ecoregion where representative species and habitats are conserved and people use marine resources in a sustainable manner.

DESCRIPTION

The general focus of the project was to protect key sites, processes and wildlife populations in the marine and coastal habitats by promoting the implementation of policies and practices that support protection and wise use of marine resources. The other area of focus was the strengthening of capacities of local, national and regional institutions to effectively participate in the conservation and wise use of the marine resources of the East African Marine Ecoregion. An Ecoregion-based conservation approach, which encompasses multi-disciplinary approaches, stakeholder participation, partnership development and adaptive management was used. The implementation of project specifically sought to identify the biological situation on the ground and threats affecting the resources. The major steps taken were a reconnaissance, biological and socio-economic assessments, and development of a biological vision and ecoregion plan for the implementation of project activities.

FEATURES OF THE CASE STUDY THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEMS APPROACH

- The project recognises the need to address both biophysical and socio-economic aspects in the conservation of marine and coastal ecosystems
- The project approach is multidisciplinary in nature and encompasses stakeholder participation and adaptive management
- The project addresses the conservation and sustainable use objectives of the CBD
- The following principles were emphasised; 2, 3, 4, 9, 11, & 12
- CBD thematic areas: Marine and Coastal biological diversity; Cross-cutting issues: Sustainable use , incentives and NBSAPs

LESSONS LEARNT

- It is difficult to identify and fix the exact boundaries of ecoregions in practice. These should be left flexible and adaptable depending on the nature of the ecoregion
- In order to use an ecoregion approach, there is need to have reliable technical and scientific information
- The mobilization of stakeholders across country boundaries may be difficult, but is an important aspect of the Ecoregion approach;
- There is need to recognise, harness and utilize ongoing activities and initiatives in the application of the Ecoregion approach.

Case Study 8

The Application Of An Ecosystems Principles In Community Based Programs: The case of the Zimuto/ Mshagashe Integrated Catchment Rehabilitation and Sustainable Development Project – Zimbabwe.

PROBLEM STATEMENT

The goal of the project was to develop and promote an integrated catchment rehabilitation of the degraded lands targeted at wetlands rehabilitation and conservation and enriching farming methods in order to avoid the land degradation both on farm and the associated natural resource niches in the catchment area.

DESCRIPTION

The following strategies have been used in the rehabilitation of the catchment.

The use of community participation methods in the planning, implementation and evaluation of catchment rehabilitation actions.

Integration of conservation measures with livelihood activities such as the integration of agroforestry activities in the farming systems for soil fertility and erosion control.

Employing catchment rehabilitation actions through a strategy that recognizes the interrelationships of the different natural resource niches.

Institutional coordination through joint multisectoral planning, implementation and evaluation of community driven actions.

FEATURES

- The project has relatively succeeded in addressing the three objectives of the CBD. Conservation and sustainable use through the development of conservation farming regimes and immediate benefits sharing at through communal gardening models and household farmstead improvements.
- Used an entry point larger than one village for field demonstration activities was used to avoid marginalizing some sectors of the community in line with principal 2.
- The involvement of many relevant stakeholders through emphasis of communities and multisectoral institutions operating in the catchment.
- Focused on inland waters through the rehabilitation of *Dambo* wetlands and dry- sub-humid lands rehabilitation.
- The design of the project had broad areas of outputs but the communities determined specifics of outputs.
- The following principles were applied 2, 4, 7, 9, 11, 12, and the guiding principles 1, 2, 3, and 5.
- Crosscutting issues of local and indigenous communities and sustainable use were relevant.

LESSONS LEARNED

- Participating institutions at field level lacked the capacity to facilitate a participatory approach having been used to the conventional (instructive) approaches.
- Community involvement and participation is an involving and long process for which both resources and timeline for activity implementation must be well factored to reasonably implement.
- Closer the management and decision making is to the community the greater the ownership, accountability and participation by the communities in the rehabilitation process.

Case Study 10

THE PENDJARI BIOSPHERE RESERVE, BENIN

PROBLEM STATEMENT

Management of Pendjari was failing as it formerly prioritised conservation for the benefit of tourism and neglected the need for grazing land and the economic needs of the local population which led to significant poaching.

DESCRIPTION

Pendjari has been a protected area since 1954 but a Biosphere Reserve only since 1986. Initially, management of the protected area was for conservation for the benefit of tourist. This system had limited success due to social and technical difficulties. For example, very year thousands of domestic animals, in particular cattle, undertook seasonal migrations through the reserves but this use conflicted with management objectives. Biosphere Reserve management has implemented an integrated approach with some success. The key changes in management include:

- Management that seeks to integrate the interests of all parties concerned.
- Community participation in management has been initiated.
- Grazing rights that have been formalised as part of a strategy to ensure that livestock rearing is sustainable and does not compromise the conservation objectives of the Reserve.
- Allowing agriculture in designated areas within the Reserve.
- Organisation of fruit picking and hunting so as to ensure it is sustainable.
- Allowing ritual use by local communities.
- Transfer of some hunting revenues to the local community.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- Conservation, equitable sharing of benefits and the sustainable use of biological diversity are addressed.
- The importance of providing alternative livelihood strategies outside the Reserve is emphasised. Tourist guides have been employed as a benefit sharing measure.
- The importance of inter-ecosystem linkages is recognised. The impact of agriculture in surrounding areas on the Biosphere Reserve is examined. In particular, the impact on the river of pesticides used in the growing of cotton requires investigation.
- Goods and services identified were: grazing resource, hunting, fishing, fire wood, fruit and cultural / religious value.
- Benefit sharing has been strengthened through granting of use, access and some hunting revenues to local communities.
- New legislation has been prepared and is being examined by the authorities with a view to legalising the participation of local communities in the management of the reserve.
- The EA may provide a basis for negotiating an agreement with Burkina Faso for the harmonisation of certain practices, especially fishing. At present, whereas Benin forbids all commercial fishing in the frontier stretch of the Pendjari river which borders the national park, Burkina Faso is intensifying its fisheries activities in the same waters on its side of the river.
- It is hoped that development agencies use the EA to harmonise their assistance. For example, the European Union has funded the protection of the Pendjari national park while simultaneously financing the development of fishing in the Pendjari river. Similarly, the World Bank, supports the management programme for protected areas at the same time as it promotes the cultivation of cotton around, and in some cases within, these areas.
- Support is needed as a priority to develop ecological monitoring.
- All Principles and Operational Guidelines were applied or considered.
- Thematic areas: forest, inland waters, dry and sub-humid lands and agricultural biological diversity.
- Cross-cutting issues: incentive measures; indigenous and local communities, benefit sharing and sustainable use.

LESSONS LEARNED

- The EA can be used to support the Biosphere Reserve through promotion of transboundary cooperation and harmonisation of development assistance.
- Conservation goals are best achieved if local human economic and cultural needs are met.

Case Study 11 CHOCÓ ECO-REGIONAL PROJECT, COLOMBIA

PROBLEM STATEMENT

The Chocó region in north-west Colombia is one of the most diverse and biologically rich regions in the world yet this biodiversity is increasingly threatened by socio-economic and development pressures. Therefore efforts are being made towards promoting local conservation and sustainable development initiatives.

DESCRIPTION

Seven years ago WWF was using the Ecosystem Management framework in order to identify, prioritise, conserve and manage natural areas. Under this approach, conservation was considered to be the main priority. However, it was recognised there was a need to complement this strategy with an assessment of socio-economic variables in order to reduce the threats and pressures on the ecosystems and natural resources of the Chocó Region. As a result, a regional project is being implemented using the following strategies: (1) promoting conservation and protection of indigenous populations, Afro-American territories and ecological reserves; (2) promoting sustainable management of forestry resources and agricultural systems; (3) strengthening local and regional organisations and capacities; and (4) analysing and influencing policies that will define the development of the region.

The main results of the project were: (1) the establishment of public and private protected areas and indigenous and ethnic reserves; (2) the formulation of a Forestry Management Plan; (3) the implementation of sustainable forestry and agricultural productive systems; (4) formulation of actions to promote conservation of river banks; and (5) the promotion of domestic animal rearing. Capacity building was also addressed.

CASE STUDY FEATURES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH

- Conservation, equitable sharing of benefits and sustainable use of the resources were simultaneously addressed.
- The case study did not illustrate the need to understand the functional relationships of ecosystems.
- In the Chocó region the goods provided by the fauna and flora included: water resources, wood, secondary forest resources, CO₂ absorption, mineral soil storage, genetic information, landscape, genetic diversity, soil erosion control, fishery resources and tourism. Local communities as well as other (non-identified) components of external markets were recognised as the beneficiaries of these goods.
- Adaptive management is not illustrated or tested in this case study.
- The local level proved to be the appropriate scale for many issues. However, the regional and national scale continued to be relevant due to National Park System in the area. The project promotes institutional relationships between the parks and the local communities.
- Linkages between different local groups such as indigenous, Afro-American, *mestizos*, farmer communities, local NGOs and governmental organisations were highlighted. These linkages, or “inter-institutional-alliances”, aimed to build local capacity to influence the decision making process and the future development of the region.
- The twelve Principles were applied. Operational guidelines 2, 4, and 5 were only applied.
- Thematic areas: forest, mountain area, marine and coastal and agricultural diversity.
- Cross-cutting issues: criteria and indicators, impact assessment, sustainable use, indigenous knowledge and National Biodiversity Strategy and Action Plans.

LESSONS LEARNED

- Valuable indigenous information was gleaned from the auto-diagnosis strategy as well as the establishment of the collective managed areas for the Afro-American communities.
- Success of territorial management relies on local community organisations and their internal regulations.
- Private reserves have been identified as suitable areas for conservation and environmental education.
- Inter-institutional alliances are an effective strategy for identifying solutions and for policy and decision making.

Case Study 12

INTER-INSTITUTIONAL INITIATIVE FOR BIODIVERSITY CONSERVATION IN THE PAMPAS REGION, ARGENTINA

PROBLEM STATEMENT

The expansion and intensification of the agriculture and livestock industry have caused destructive impacts in the pampas landscape and ecosystems. In order to minimise environmental impacts, it was necessary to design environmentally sound agricultural and cattle-raising practices.

DESCRIPTION

The Inter-Institutional Initiative for Biodiversity Conservation of the Pampas Region, BIOPAMPA, is a joint effort co-ordinated by various private and governmental sectors and oriented towards the conservation and sustainable use of this region, under the auspices of the Argentinean IUCN Committee and the Regional IUCN Office for South-America (IUCN-SUR). BIOPAMPA has the following objectives: (1) contribute to the effectiveness of action priorities identified in the National Biodiversity Strategy by means of the formulation of regional inter-sectoral programmes based on the Ecosystem Approach; (2) consolidate knowledge and improve communication and co-operation among institutions; (3) incorporate rural agricultural and cattle-raising producers into the Initiative; and (4) incorporate the different organisations and levels of political decision-making into the Initiative.

An Inter-Institutional workshop was organised. For the period 2000-2001, a series of encounters among the different sectors directly involved with the agriculture and livestock industry, are planned. Fieldwork guides on the sustainable use of resources are in preparation. Relevant sites are currently been identified and mapped to advance the bio-regional planning process.

CASE STUDY FEATURES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH

- The Pampas case study simultaneously addressed conservation, sustainable use and equitable sharing of the benefits.
- BIOPAMPA carried out research activities through universities, NGOs and other organisations that aimed to strengthen scientific knowledge about the taxonomy, phytogeography, populations and functioning of this ecosystem.
- The main goods and services provided by the ecosystem's biodiversity were identified as: soil protection; partial barrier for the invasion of alien species; natural mechanisms for the control of plague species; habitat for endangered species; options for the productive management of the wild fauna; management options for the improvement or domestication of new cultivable species; ecotourism and sports hunting; grazing lands; water retention; pharmacological substances and aesthetic and spiritual values. Beneficiaries of these goods and services were identified as the cattle-raising and agricultural producers; the pharmacological and plant development companies; researchers and society in general.
- BIOPAMPA expects to use an adaptive strategy, especially for the monitoring phase.
- The regional "Pampas ecosystem" was chosen as the appropriate scale of management.
- The BIOPAMPA strategy included using inter-sectoral group linkages. Several biodiversity-related organisations were invited to formally join the Initiative in order to strengthen its activities and help it to have an impact with decision makers. In total, 37 research and conservation projects and a number of have joined the Initiative and, in addition, other important Government and agricultural producer organisations have also joined.
- Except Principle 9, all Principles were applied or considered (Principle 3 was considered to be important but has yet to be actively applied). The five Operational Guidelines were applied.
- Thematic areas: biological diversity of inland waters, dry and sub-humid lands, agriculture and mountain areas.
- Cross cutting issues: alien invasive species, indicators, impact assessment, sustainable use, and National Biodiversity Strategy and Regional Action Plans. The case does not addressed the use of indigenous or local knowledge.

4 LESSONS LEARNED

- Early involvement of the various sectors, particularly at the local level, is essential for success.
- High level political support is considered as a key feature for the success of the Initiative.
- It is necessary to work with the media in order to publicise the Initiative, mainly because politicians are very sensitive to the media and social demands.

Case Study 13

ECOLOGICAL CORRIDORS: ECOSYSTEM APPROACH IN ENVIRONMENTAL MANAGEMENT, BRAZIL

PROBLEM STATEMENT

In order to avoid deleterious effects of species and ecosystems isolation, the concept of ecological corridors was introduced as an attempt of augmenting the connectivity between fragmented areas. The corridor was designed to enhance the conservation and sustainable use of ecosystems within the "Itenez-Bolivia/Guaporé-Brasil" area, respecting the rights and prerogatives of the local human existing populations.

DESCRIPTION

One of the most important causes of biodiversity loss is habitat fragmentation. In fragmented ecosystems the rate of extinction is higher compared with species within non-fragmented ecosystems. A large river basin region in Bolivia and Brazil, which contains indigenous reserves and large natural protected areas, is the testing ground for a project that will study, identify and implement connected areas. The corridors were located along the roads BR-421 and BR-429 and on the left bank of Guaporé – Itenez River in Brasil, and in Baures-Itenez area in Bolivia.

Implementation of this project requires: (1) a full diagnosis of the status of the existing conservation units; (2) the design of connected areas or corridors; (3) the design of a programme on information-exchange between managers, directors and warden staff of protected areas; (4) identification of strategic points for conservation and management actions; (5) involvement of the local population through capacity building and environmental education; (6) harmonisation of public policies with the goals of sustainable development; (7) provision of technical, economic and scientific support to the local communities and other productive sectors; (8) the launch of pilot projects on natural resource management; and (9) identification of alternative tourism within the protected areas.

FEATURES OF CASE STUDY THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- The three objectives of the CBD, conservation, sustainable use and equitable sharing of the benefits are simultaneously addressed in the case study.
- The diagnosis phase of the project illustrated the need for a better understanding of ecosystem processes and functions.
- Goods and services are not identified in the project, but equitable sharing is addressed in relation to the possible benefits that should materialise when the project is implemented.
- Adaptive management is neither illustrated nor addressed in the case study.
- The most appropriate scale depended on the issue being addressed.
- Linkages between sectoral groups are illustrated by the creation of various committees involving different governmental and non-governmental institutions.
- All Principles were addressed. There is no mention of the Operational Guidelines.
- Thematic area: forest biological diversity.
- Cross cutting issues: sustainable use and indigenous and local knowledge.

LESSONS LEARNED.

- The Ecosystem Approach is an effective basis for planning ecological corridors.

Case Study 14 **THE MARINE RESERVE OF GALAPAGOS, ECUADOR**

PROBLEM STATEMENT

During the '90s the Marine Reserve of Galapagos confronted strong discrepancies between the interests of the different users in the area. The major conflict stemmed from the exploitation of marine resources (e.g. sea cucumbers) which resulted in direct confrontation between the local artisan fishermen and the rest of the users of the Marine Reserve. A new, participatory process has aimed to protect and conserve coastal-marine ecosystems and biodiversity of the Galapagos Archipelago for the benefit of humankind, science and education.

DESCRIPTION

A number of issues have contributed to the recent conflict in the Galapagos; in summary: the Marine Reserve unit was not a management unit recognised by the Ecuadorian National Protected Areas System; legal aspects of the Reserve were weak in terms of conservation; the institutional capacity for the control of the Reserve was insufficient; and the approved Management Plan for the Reserve was rigid and non-adaptive and never implemented nor known by local fishermen. As a consequence of this complex situation, a participatory process, involving all stakeholders, was designed and orientated towards the conservation of the marine area of the Reserve.

A Core Group was established by local stakeholders, such as the local fishing community, the National Army, conservation and tourism sectors and the Galapagos National Park representatives. The main task of the Core Group was to elaborate a new management plan that is supported by the Special Regime Law for the Conservation and Sustainable Use of Galapagos' Province. This law established the Reserve as part of the National Patrimony of Protected Areas and the Galapagos National Parks Directorate as the administrative body of the Marine Reserve. In addition, the area of the Marine Reserve was extended from 15 to 40 nautical miles (current total area is 133,000 square kilometres) and industrial fishing activities were forbidden within the Marine Reserve limits. In 1999, the new Management Plan of the Reserve, shaped by the Core Group, was finally approved.

CASE STUDY FEATURES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH

- Conservation, equitable sharing of benefits and sustainable use of resources were simultaneously addressed.
- The Reserve carried out research on ecosystem functioning including the study of the human-environment relationships that occur in the archipelago.
- Goods and services were identified: scientific research, fishing and tourism activities. Beneficiaries of these goods and services were identified as all the active persons directly or indirectly related to tourism, fishery and research-conservation activities carried out within the Reserve.
- Planning and management employs an adaptive strategy; this is supported by the *Special Regime Law*.
- Through the learning-by-doing process an appropriate scale of management was employed according to the nature of the problem and the actors involved.
- The case study identifies and illustrates the linkages between the different sectoral groups as well as the need for and constraints on such linkages.
- All Principles were applied. Principle 9 was not explicitly identified in the case study though it indirectly refer to in the *Special Regime Law*, which recognises that changes occur in systems and these should be considered in decision making. Operational guidelines were not explicitly tackled, however, all of them are indirectly considered.
- Thematic areas: marine and coastal biodiversity.
- Cross-cutting issues: benefit-sharing, and local knowledge.

LESSONS LEARNED

- Problems associate with socio-economic pressures, conservation measures and unsustainable use of natural resources must be resolved through a management process involving all local stakeholders.
- The economic appraisal of conservation and the sustainable use of resources generates interests from the political and economic sectors.
- A high level of communication and political support is needed for the development of the overall management system.

Case Study 15

GUIDING PLAN PROPOSAL FOR THE BAÑADOS DEL ESTE BIOSPHERE RESERVE, URUGUAY

PROBLEM STATEMENT

An interdisciplinary team was set up in order to initiate the re-definition and re-zoning of the Bañados del Este Reserve in a manner that recognised both the socio-economic and biogeographic realities of sustainable development and conservation.

DESCRIPTION

Since 1997, the PROBIDES Programme (Biodiversity Conservation and Sustainable Development Programme in the *Este Wetlands*) was engaged in preparation of the Guiding Plan for the management of the Bañados del Este Biosphere Reserve. The Plan aimed to delimit the reserve area and propose its zoning. The Guiding Plan resulted in a planning instrument for the effective implementation of both conservation and sustainable development within the Reserve. The Plan contained a set of recommendations and actions orientated towards better land-use management.

Public and private institutions collaborated so as to delimit zones within the Reserve. The adopted methodology allowed the progressive identification of an action plan designed to deliver conservation and sustainable development through: (1) identification of environmental units, (2) elaboration of a conceptual framework for the interpretation of the actual situation and the evaluation of the relationship between man and his environment, (3) study of the current legal framework of the Reserve, (4) identification of land use patterns, (5) generation of a complete a data base for GIS, and (6) identification of the degree of conflicts between different sectors. A set of recommendations were proposed after the evaluation of the environmental units, land uses and conflicts.

CASE STUDY FEATURES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH

- Conservation and sustainable use of resources are addressed but equitable sharing was not addressed.
- The need for greater understanding of the ecosystem and its processes was noted as a key element for the Guiding Plan.
- Goods, services and benefit sharing are not identified in the case study.
- Adaptive management strategies are underlined as a component of the Guiding Plan.
- Both regional and local levels were recognised as the appropriate scales of management.
- The relevant sectoral groups were identified as: NGOs, public bodies and private sectors that are directly related with the Reserve.
- Principles 1, 2, 6, 10 and 12 were applied. Principle 4 was indirectly applied through an economic valuation of the Reserve's natural resources. There is no explicit mention of the Operational Guidelines.
- Thematic areas: biological diversity of inland waters, agriculture and marine and coastal areas.
- Cross cutting issues: sustainable use.

LESSONS LEARNED

- A MAB-IUCN framework proved to be most appropriate for the zoning of the Reserve's area, in particular for the management and protection of important natural habitats or vulnerable species.
- Further, area-specific management plans will be needed in the future, based on the Guiding Plan template.

Case Study 16 **LA SEGUA WETLAND MANAGEMENT, ECUADOR**

PROBLEM STATEMENT

A number of environmental problems have threatened *La Segua* wetland ecosystem. These include the use of toxic fertilisers, dam construction, bird hunting and solid waste dumping. Since 1993 an integrative participatory management process aimed to conserve the environmental integrity and functioning of *La Segua* wetland in order to maintain its productive activities and flux of goods and services to its inhabitants.

DESCRIPTION

Active management of *La Segua* wetland has been in place for more than ten years and has resulted, among other things, in the declaration of *La Segua* as a Ramsar site. An initial attempt was made to identify problems and conflicts in the area, as well as possible solutions. This resulted in the development of a conceptual framework for the management plan, its adoption and its implementation. In collaboration with the Ministry of Environment, IUCN and Fundacion Natura (local NGO), the *La Segua* management Plan has developed different programmes in order to improve agricultural practices, develop ecotourism and start an environmental education program.

The above process incorporated three phases: issues diagnosis, management plan development and its local adoption. These steps have been successfully accomplished and a legal committee representing local users has also been established.

CASE STUDY FEATURES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH

- Conservation, sustainable use and benefit sharing were simultaneously addressed.
- Functional relationships and processes are fully understood. *La Segua* wetland is one of Ecuador's most well known ecosystems.
- Goods and services provided by *La Segua* were recognised as fishery and food resources, ecotourism (birdwatching), agricultural services, cattle forage, and honey production. Benefit sharing of these goods is addressed in the management plan. The beneficiaries of these goods and services are the local fishermen and farmers, and local communities.
- Adaptive management is one of the attributes of the *La Segua* management process.
- Management at the local level was most frequently applied. Regional and/or national level management was also applied in the decision making process, wherever appropriate.
- Full use of inter-sectoral linkages were illustrated throughout the case study. The level of intervention, and the organisation involved, depended on the issue and its scale. For instance, some Management Plan policies need intervention at the central Government level but they also require the collaboration of local level organisations and NGOs if they are to be successful.
- Principles 5, 6, 7, 9 and 11 were not addressed in the case study. Operational guidelines were all undertaken.
- Thematic areas: inland water biological diversity.
- Cross cutting issues: indigenous and local knowledge and sustainable use.

LESSONS LEARNED

- Participatory management was the basis for this application of the Ecosystem Approach
- Low but continuous economic investment is required during the whole planning process.
- Local users of natural resources are willing to collaborate in conserving their environment if economic benefits, property rights and access to land are not diminished or affected.
- The *La Segua* Management Plan is a good strategy for local participation and co-ordination.

Case Study 17

INTEGRAL USE AND MANAGEMENT OF TUMBES MANGROVES, PERU

PROBLEM STATEMENT

The Tumbes Mangroves National Sanctuary in northern Peru had a number of environmental problems such as changes in land property rights, the destruction of a large proportion of mangroves to install commercial shrimp ponds and the contamination of rivers and estuaries. An integrated management approach was adopted for the protected area to: (1) ensure the conservation of northern mangrove ecosystems, (2) improve the welfare of local people and (3) maintain biological diversity for the benefit of current and future generations.

DESCRIPTION

In 1988, the Peruvian Government decreed established the Tumbes Mangroves National Sanctuary as a protected area. However, the protected area did not address the pressure on local resources thus a strategy for their conservation was supported in collaboration with Pro-Naturaleza (a local NGO) and WWF. Since 1995, Pro-Naturaleza adopted the integrated management approach in the Tumbes Sanctuary in order to ensure mangrove forest conservation.

The administration and management of the Sanctuary was strengthened by: (1) site patrolling; (2) elaboration of a master plan; (3) setting up a management committee; (4) description, monitoring and identification of sanctuary users; (5) evaluation of tourism possibilities; (6) identification and promotion of artisan micro-enterprises; (7) empowerment and environmental education of mangroves users, journalists, local authorities, teachers and children; (8) mangrove reforestation; (9) socio-economic examination including gender issues; (10) extractive activities identification; (11) environmental impact assessment of shrimp farming activities; (12) project results publicising; (13) elaborating agreements between NGO, local governmental authorities, universities and aquaculture companies; and (14) workshops on participatory planning process.

CASE STUDY FEATURES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH

- Conservation, equitable sharing of benefits and sustainable use of the resources are simultaneously addressed.
- Research activities within the Sanctuary attempt to understand ecosystem functional relationships, including the human component.
- The main products or services provided by the Sanctuary area were identified as fishes, shrimps, molluscs, other animal-catch related to mangrove areas, wood, honey, water for shrimp cultivation, tourism space and control of erosion. Beneficiaries of the area extend from the shrimp cultivating companies to local fishing communities. Benefit sharing was poorly addressed.
- There is no explicit mention of adaptive management. However, elements such as monitoring and evaluation were incorporated in the planning process.
- Appropriate scale was select according to the issue.
- Inter-sectoral co-operation has been fundamental to the whole project process, including its design.
- Operational Guidelines and Principles (except Principle 9) have been applied.
- Thematic areas: forest, inland waters and marine and coastal biological diversity.
- Cross-cutting issues: indicators, sustainable use and National Biodiversity Strategy and Action Plans.

LESSONS LEARNED

- Working at the ecosystem level and applying the Ecosystem Approach is complex, yet productive, though it will depend on the size of the site.
- A high level of communication between the different sectors of the area was identified as a key component of the approach.

Case Study 18

MANAGEMENT PROPOSAL FOR THE SOUTH BUFFER ZONE OF THE BENI BIOLOGICAL STATION BIOSPHERE RESERVE, BOLIVIA

PROBLEM STATEMENT

At the beginning of the '90s, an on-going initiative was launched in the Beni Station Biosphere Reserve with the aim of achieving a balance between biodiversity conservation and autonomous sustainable development of the indigenous and local populations located in the vicinity of the Beni Station Biosphere Reserve. Without this initiative both the biodiversity of the Reserve and the well being of local people were likely to deteriorate.

DESCRIPTION

To achieve the objective, four main lines of action were proposed: (1) to update the land-tenure system and the official land register, (2) enhancing the economic and productive output of the region, (3) strengthening biodiversity conservation and (4) improving the living conditions of the local population. A joint planning initiative resulted in a zoning proposal for the buffer zone that was compatible with the needs of the local population and the conservation objectives of the Reserve. A committee was established to oversee the implementation of a working plan.

The project intended to strengthen indigenous social organisations and their management capabilities. The recovery of traditional botanical knowledge, agricultural and forestry practices and the socio-economic diagnosis of local populations served as background for launching a management project of the Beni Biological Station Reserve's buffer zones. These efforts showed the way for the development of a strategic management plan for the south buffer zone of the Beni Station Biosphere Reserve.

CASE STUDY FEATURES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH

- Conservation, sustainable use and equitable sharing of the benefits were addressed.
- Greater understanding of ecosystem functioning is not highlighted.
- Biodiversity components traditionally used for food and pharmaceutical purposes were recognised as goods and services. Local indigenous peoples and farming communities were identified as the recipients of these goods and services.
- The case study illustrates adaptive management.
- The local-indigenous level was identified as the appropriate working scale for addressing the issues.
- Linkages and responsibilities of the various sectoral components were identified. Among the sectoral groups identified were: the National Institute for the Agrarian Reform, the Forestry Superintendence, the General Biodiversity Directive, the National Protected Areas Service, the General Direction of Land Ordering, the San Borja and Santa Ana Municipalities, the Beni Departmental Authority and the South Buffer Zone Integral Development Local Committee.
- All the Principles and Operational Guidelines were applied and illustrated.
- Thematic areas: dry and sub-humid lands, forest and agricultural biological diversity.
- Cross-cutting issues: impact assessment, sustainable use, benefit sharing and local knowledge.

4 LESSONS LEARNED

- In this case study, the long on-going participatory processes have shown positive results through the development of strategic management plans.
- The participatory process must be flexible and dynamic.
- Different actors and components of the process should be involved from the beginning during the planning and discussion stages.

Case Study 19

THE ECOSYSTEM APPROACH APPLIED TO THE *VINALARES* SYLVO-PASTORAL MANAGEMENT IN THE CENTRE OF FORMOSA, ARGENTINA

PROBLEM STATEMENT

Vinal (*Prosopis ruscifolia*) is an aggressive and invasive shrub species that usually affects over-grazed savannas, transforming them into dense shrub land. A new approach - sylvo-pastoral management – has been applied to restore the productivity of *vinal* (*Prosopis ruscifolia*) invaded areas of savanna at no net cost to local producers.

DESCRIPTION

Numerous attempts were made to eradicate *vinal* during the '70s in order to restore grazing and foraging areas. However, these efforts were only effective in the short term. In the long term they resulted in stronger re-colonisation. A further drawback was that the eradication of *vinal* was very expensive. Application of an alternative strategy - sylvo-pastoral management - has improved the foraging quality of lands invaded by *vinal* at no extra cost to livestock producers. This strategy has involved the pruning and thinning of trees together with the management of grazing by cattle.

Sylvo-pastoral management experimental plots were identified by local groups of small producers. Mature and sick *vinal* trees were cut down in each plot. This phase of the project produced useful products: charcoal and floorboards. A cost-benefit analysis was made for the production and yield of these products. Marketing the products were undertaken through local co-operatives. Native flora species were incorporated into the system and monitored during a second phase of the project.

CASE STUDY FEATURES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH

- Conservation, equitable sharing of benefits and sustainable use of the resources were simultaneously addressed.
- This case makes full use of the understanding of the functional relationships and processes in the *vinal* ecosystem, especially since 1993 through the work of the GESER Group (Group of Regional Ecological Studies).
- Floorboards, charcoal production and the expansion of grazing lands were identified as the services produced by the sylvo-pastoral system. Benefit sharing was addressed by co-operatives who distributed revenues from the sale of wood products.
- Adaptive management is not illustrated in the case study.
- The appropriate scale of management was identified to be the local level, where local producers, co-operatives, technicians and scientists were the main actors.
- Linkages between different sectoral groups were illustrated through co-operation between the scientific sector, non-governmental and governmental organisations and the small local producers of the region.
- With the exception of Principles 3 and 11, all Operational Guidelines and all Principles were applied.
- Thematic areas: biological diversity of dry and sub-humid lands, forest, and inland waters.
- Cross cutting issues: invasive alien species, indicators, benefit-sharing, indigenous and local knowledge, sustainable use, National Biodiversity Strategy and Action Plans, and impact assessments.

LESSONS LEARNED

- Marketing of products obtained from the natural system is identified as a vital component for the success of the project.
- Co-operative and integrated work proved to be a good management strategy.
- Local level initiatives that improve local environmental policies benefit from support at the national and regional levels.

Case Study 20

INTEGRAL PROTECTIVE PROGRAMME FOR THE GUACHARO NATIONAL PARK, VENEZUELA

PROBLEM STATEMENT

Several studies in the north-eastern region of Venezuela, in Monagas and Sucre states, showed that the Guacharo National Park area was inadequate for the protection of the Turimiri River basin forest that guarantee the survival of birds colonies of Guacharos (*Steatornis caripensis*). Conservation concerns have been addressed using a combination of restoration, reserve enlargement and protection and meeting socio-economic needs.

DESCRIPTION

In response to the growing recognition of the conservation value of the Park area, including the discovery of new pristine forests, caves and sink-holes, the Government approved the enlargement for the National Park area from 15.000 ha to 62.700 ha. In addition, the overall protection of the Guacharo National Park was enhanced by the following main sub-projects:

Cerro Negro Project: Reforestation of the area (2000 ha) affected by fire in 1987 by the planting of pioneer species and, with support from the national oil company, the spraying of pre-germinated seeds.

Middle Basin Project: Protection of the forest by the employment of park wardens and also through research and environmental education. As a result of the research activities carried out by Audubon de Venezuela (an NGO), researchers from the Universidad de Oriente, and with financial support from the national oil company, new bird and endangered vertebrate species were reported. Ten flora species were found to be endemic to the Turimiri River basin. Moreover, local NGOs launched awareness campaigns in local schools.

South-Basin Programme: Agro-socio-economic features of the southeast basin population were studied. An assessment of the quality of life, production systems and economic activities of the local population was made. Given the results of this assessment, the project sought to involve the local farming community in the cultivation of coffee, a highly profitable crop.

CASE STUDY FEATURES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH

- The case study highlights, in particular, the conservation of the area. Sustainable use of the resources and equitable sharing of the benefits were also addressed through the programme of coffee cultivation by local farmers.
- On-going research programmes in the Guacharo National Park include efforts to describe ecosystem processes.
- Goods and services are not clearly identified, however economic benefit sharing and management practices in which local farmers take leadership are being considered.
- The case study did not address adaptive management guidelines or strategies.
- Appropriate level was selected according to the issue.
- The value of linkages between different sectoral groups are clearly illustrated by the participation of different local stakeholders, e.g. the national oil company gave logistic and financial support, while local NGOs (Audubon, Fundación Caripe) and farmers allowed the fulfilment of the project objective.
- The case study applied only eight Principles. Principles 3,6,8 and 9 were not relevant. The Operational Guidelines were neither directly mentioned nor taken into account, but they were indirectly applied.
- Thematic areas: forests, mountains and agricultural biodiversity.
- Cross cutting issues: benefit sharing and sustainable use.

LESSONS LEARNED

- The success of the project was possible through the collaboration between the private oil enterprises, local and national NGOs, scientific sector, governmental support and local communities agreement.
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Case Study 21
SOME EXPERIENCES ON THE APPLICATION OF THE ECOSYSTEM
APPROACH: THE CASE OF THE LARGE-SCALE ECOSYSTEM HEALTH STUDY
OF THE LANGAT BASIN, MALAYSIA.

PROBLEM STATEMENT

The project developed a basin-wide perspective of relationships between the environment and development in the Langat Basin, using the ecosystem approach to determine the status and threats faced by biological diversity through loss of forests and wildlife habitats as well as through pollution of rivers in the Basin.

DESCRIPTION

An integrated multi-disciplinary study of the Langat Basin was commissioned to facilitate and promote the ecosystem approach as a basis for environmental planning and management in the long-term. The Langat Basin has been the focus of much rapid and large-scale physical and economic development. Large areas of land with natural cover have been lost to agricultural development, industrialization and urbanization since the early 1970s. The concomitant ecological and environmental degradation in the Basin has had considerable effect on the status and sustainability of biological diversity in many regions of the Basin. This project successfully delineated and identified these areas which are of primary concern for biological diversity conservation in the Basin. The Project also enabled the development of a firm understanding of the driving forces for biodiversity loss and how they are related to trends in industrialization and urbanization prevalent in the Basin. The relationships between loss of natural areas high in biological diversity and population growth, land-use patterns, mineral resource exploitation and river pollution have been described and modeled. A pilot version of an ecosystem scenario tool has been developed that enables the display of potential future ecosystem scenarios in the Basin for use by policy- and decision-makers.

FEATURES OF THE CASE STUDY THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- The project was planned and executed as a multi-disciplinary study using the ecosystem health framework for analyses from its outset. It involved the participation of specialists in aquatic and terrestrial species inventories, ecologists, botanists, zoologists, geologists and soil scientists, sociologists and economists.
- The study area was delineated into three ecological “zones” based on their physiognomy, geomorphology and edaphic characteristics.
- Maintaining ecosystem “integrity” across the Basin was a priority objective of the management recommendations from the Project.
- Conservation of ecosystem structure and function as well as of the role of biological diversity in the provision of these products and services were emphasised as a priority issue during the entire duration of the study.
- The following Principles were emphasised: 1,2,4,5,6,7,8,9,10,11,12.
- Thematic Areas covered: Inland waters, forests, coastal and marine, agricultural and mountain areas. Cross-cutting issues: Invasive alien species, indicators, impact assessment and sustainable use.

LESSONS LEARNED

- Broad unifying conceptual framework (e.g. ecosystem health) and multidisciplinary involvement crucial from the beginning of the initiative.
- Results of studies must be placed within the context of relationships between the ecosystem and development in the Basin as well as with ecological processes within the ecosystem.
- Multiple stakeholder participation and buy-in crucial for success of the ecosystem approach.
- The systems ecology approach can assist integration of diverse findings and modeling is essential when dealing with multiple variables simultaneously necessary for scenario development..
- The issues of scale mismatch, institutional fit, scale discordance and cross-scale dynamics need to be addressed.

Case Study 22

COMMUNITY-BASED TIGER CONSERVATION IN CAMBODIA: USING THE TIGER AS AN UMBRELLA SPECIES FOR THE ECOSYSTEM APPROACH

PROBLEM STATEMENT

Urgent efforts are needed to address the threats to tigers from rapid loss habitat and hunting pressure.

DESCRIPTION

The goal of the Community-based Tiger Conservation in Cambodia is: “to conserve biodiversity by promoting local education and participation in conservation of tigers as an umbrella species”. The project aims to achieve this goal by pursuing the following objectives:

1. Establish tiger conservation offices in the 3 largest Tiger Conservation Units.
2. Recruit staff of wildlife technicians from the hunters interviewed in previous surveys.
3. Train provincial officers and newly recruited wildlife technicians to accomplish objectives 4-6.
4. Monitor wildlife and human activities through regular patrolling of the Tiger Conservation Units.
5. Conduct village conservation education workshops.
6. Facilitate education, health care and alternative economies in Tiger Conservation Units villages.

After decades of turmoil and war, the initiative is facing significant challenges to engaging local people. The initiative is promoting wider engagement from government and NGOs to meet human needs.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- This community-based initiative is primarily aimed at conservation. However, the initiative recognises that a balance between use (i.e. hunting of non-endangered species) and conservation of the tigers’ extensive habitat is essential for meeting conservation objectives in the long term.
- Functional relationships and processes of ecosystems are identified as benefiting indirectly from this initiative.
- Local people requested the project and it aims to promote societal choice by building bridges between the people and the government after two decades of poor relationships. Local people are involved in management and government officials have participated in seminars to set biodiversity priorities.
- Ecosystem functioning was not explicitly addressed.
- Benefit sharing is indirectly addressed by the salaries paid to locally hired wildlife technicians. The TCUs also facilitate the involvement of development NGOs who are otherwise not present in these remote regions.
- The Tiger Conservation Units define the scale of management intervention. These typically cross provincial boundaries. Their establishment involved overcoming significant logistical and administrative hurdles.
- In the long-term the initiative will encourage rural development and eco-tourism as strategies to meet human needs.
- Local knowledge is key to the success of the Tiger Conservation Units. Hunters have been recruited to act as “wildlife technicians” and motivated to learn new data-gathering skills.
- Monitoring of tiger and human activities is undertaken by personnel with local knowledge.
- The initiative strives for intersectoral cooperation by linking communities with central government.
- Principles 1, 2, 4, 5, 8, 10, 11, 12 and Operational Guidelines 2, 3, 4 and 5 were all applied.
- Thematic area: biological diversity of forests, mountain areas and dry and sub-humid lands.
- Cross-cutting issues: indigenous and local communities; sustainable use.

LESSONS LEARNED

- Broad scale management needs cooperation among institutions. However, while everyone has accepted that large-scale management is needed there has yet to be much action.
- Hiring local hunters provides the initiative with crucial local knowledge and helps in communication efforts.

Case Study 23

RICE IPM AS APPLICATION OF THE ECOSYSTEM SYSTEM APPROACH IN INDONESIA AND ELSEWHERE IN ASIA

PROBLEM STATEMENT

Intensification of rice production and, particularly, the inappropriate use of pesticides to control pests is damaging to biodiversity and human health. In addition, the government subsidies for pesticides are often a significant cost to taxpayers.

DESCRIPTION

Rice Integrated Pest Management (IPM) was introduced first in Indonesia in 1989 in response to threats to rice production. The main tool of the IPM programme is the "farmer field school", a form of community-based informal adult education. Farmers gain a firm understanding of ecological principles, monitor the progress of their crop, and examine the distribution of insect pests, their natural enemies and other components of biological diversity. The lessons from field schools are scaled up through farmer-to-farmer learning. To date over one million Indonesian rice farmers have graduated from farmer field schools, over 400,000 in Viet Nam, and over 170,000 in the Philippines. The programme has been extended to Africa and to other crops. In the case of rice, crop diversity is low but associated biodiversity is high and critical to ecosystem functioning. Additionally, diversity at the landscape level is important to reducing the costly use of pesticides. The IPM approach has empowered farmers to become better managers of their crops, and thereby to improve production whilst substantially reducing pesticide inputs.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- Conservation, equitable sharing of benefits and sustainable use of the resources are simultaneously addressed by the IPM approach.
- Understanding and conserving ecosystem functioning is essential for IPM. One of the key aspects of IPM is the conservation of natural enemies of crop pests and this in turn depends on high soil organic matter content and a functioning agro-ecosystem.
- Goods (crops) and services (natural enemies of crop pests) were identified. Watershed protection, clean water and a healthy environment were also identified as services provided by IPM.
- In addition to rice, fish, soybean, maize and other vegetables can be produced in rice fields where IPM is practiced. The farmer also benefits from reduced costs and increased yields. Global benefits such as crop diversity and culturally diverse landscapes were also identified.
- Ecosystems need to be managed at multiple scales. Both the individual farm and the wider community were identified as appropriate scales for management as both are relevant to dissemination of IPM approach. The landscape scale is also important as landscape scale heterogeneity in crop systems can result in significant reduction in crop losses to pests. Asynchronous planting of rice helps to support strong populations of natural enemies.
- Local actions benefit greatly from intersectoral policy measures such as: (a) promotion of IPM as a national policy, as in Indonesia; (b) changes in incentive measures such as the removal of subsidies for pesticides, and/or the application of taxes on pesticides; and (c) regulatory measures, such as the banning of particularly harmful pesticides.
- Adaptive management is a core component of IPM as farmers are trained to monitor the crop ecosystem regularly and intervene appropriately only when necessary.
- All Principles and Operational Guidelines were applied.
- Thematic areas: agricultural biological diversity.
- Cross-cutting issues: indicators, incentives, indigenous and local communities and sustainable use.

LESSONS LEARNED

- The EA has the potential to reconcile the needs for increased food production, provision of other goods and services, and also to contribute to conservation.
- Agricultural biodiversity is of great importance, even for crops based on a single variety. Associated biodiversity is critical to ecosystem functioning; landscape diversity is also important.
- The case-study illustrates the usefulness of practical examples in addition to an enabling policy environment.
- The "farmer field school" approach is highly effective at disseminating IPM.

Case Study 24

THE FIRST STEP TO CALCULATING THE TOTAL ECONOMIC VALUE OF CAN GIO MANGROVE ECOSYSTEM

PROBLEM STATEMENT

Restoration of the mangrove forest ecosystem was necessary to re-create a green belt around Ho Chi Minh City after nearly all the forest was destroyed by US forces spraying herbicides during the Vietnam war.

DESCRIPTION

The Can Gio mangrove ecosystem is the first Mangrove Biosphere Reserve in the world. Forestry staff have worked with the people of Ho Chi Minh City to restore the mangrove forest over twenty two years. The total economic value has been calculated to demonstrate the importance of the restored ecosystem. Biodiversity is increasing rapidly. Both flora and fauna show year on year increases since restoration efforts began. Four factors were identified as being key to the successful ecosystem restoration:

1. Supportive policies of the city authorities.
2. A high level of commitment of the forestry organisation staff.
3. The contribution of local people to the forest planting and protection.
4. Financial support and extension work to assist forest residents in income generation.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- Conservation, equitable sharing of benefits and sustainable use of the resources were simultaneously addressed.
- Goods and services were identified: forest products; aquatic resources; salt production; carbon fixation; and a landscape that is attractive for recreation, relaxation, eco-tourism, education and research.
- Local people have made a vital contribution to the forest planting & protecting works. The government allocated forest land to local people. In return for protection of the forest, residents are also allowed to harvest seafood. The benefits enjoyed by local people are improving significantly, so they are motivated to work very hard in forest planting and protection.
- Two scales of management were identified: Ho Chi Minh City and the communities resident in the forest zone.
- The total number of species is monitored as one criterion for measuring the success of activities.
- The total economic value of the ecosystem was the focus of this case study.
- Principles 1, 2, 3, 4, 5, 6, 7, 8, 10 and 12 along with Operational Guidelines 2 and 4.
- Thematic area: biological diversity of marine and coastal and forest ecosystems.
- Cross-cutting issues: incentives, impact assessment, benefit sharing, indigenous and local communities and sustainable use.

LESSONS LEARNED

- Land gifts and promotion of sustainable harvesting are an effective way of ensuring the vital commitment of local residents.
- Total Economic Value is a powerful tool for demonstrating the cost effectiveness of meeting CBD objectives to policy makers.
- Long term political support can be necessary to provide the continuity that is essential for ecosystem restoration.

Case Study 25

THE ROLE OF *MELALEUCA* WETLANDS IN PROVIDING ECOSYSTEM SERVICES FOR PEOPLE AND THE ENVIRONMENT IN THE MEKONG DELTA, VIETNAM

PROBLEM STATEMENT

An increasing proportion of the Mekong Delta has infertile, acid sulphate soil. This soil type is becoming more widespread in the Delta as a result of drainage of wetlands, removal of *Melaleuca* (*Melaleuca cajuputi*) trees and other natural vegetation, agricultural production, poverty and the expansion of canals.

DESCRIPTION

Currently about half of the Mekong Delta has acid sulphate soils that severely limit their agricultural potential. These soils severely limit productivity in an area that is otherwise highly suited for agriculture in terms of landscape, climate and proximity to population centres. Recent research on ecosystem functioning has helped build understanding of how environmental and economic benefits can be simultaneously achieved. In particular, research has demonstrated the role of *Melaleuca* in improving water quality, thereby lowering the acidity of soil in surrounding fields. The relationship between depth of water in the *Melaleuca* wetland forest reservoir and days of irrigation needed for good soil quality has been established. This discovery makes it possible to use *Melaleuca* to lessen the acidity of affected soils and increase agricultural production. The alternative is to restore wetlands on severely acidic soils that are no longer suitable for agriculture as a result of drainage. However, the pressures for agricultural expansion are great. This study advocates looking at the whole Mekong Delta, including issues such as urban migration and alternative livelihood strategies. The best solution is to have an educated community and an integrated farming system. This will improve livelihoods and the environment. Management solutions need to balance the need for *Melaleuca* with the need for crop land. Agroforestry may also be a viable option.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- Conservation, equitable sharing of benefits and sustainable use of the resources are simultaneously addressed. The study advocates a balance between conserving wetlands that improve water quality and promotion of agriculture that benefits from the improved water (and hence soil) quality).
- Understanding and conserving ecosystem functioning is key to this case study. The impact on surrounding ecosystems is also considered: acid sulphate soils leach pollutants into aquatic ecosystems.
- Greater and sustainable production of crops were the main goods identified, in addition to the honey, essential oils, fish and timber yields from the *Melaleuca* forest. The improvement of water and soil quality by *Melaleuca* was the principal ecosystem service identified. Other services include wildlife habitat and wind break.
- Farmers and their communities were the main people to benefit from improved soil. The wider community also needs to see immediate benefits as poverty is a major driving force leading to overexploitation of *Melaleuca* wetlands.
- The case emphasised the need to work with individual farmers and to provide immediate benefits.
- Intersectoral cooperation is vital as the Delta needs to be managed as a whole. In other words, agriculture, conservation, canals and development must follow coherent strategies. There is a need for policy leadership to reverse damage to wetland ecosystems.
- All Principles and Operational Guidelines were applied or considered.
- Thematic areas: agricultural and inland waters biological diversity.
- Cross-cutting issues: incentives, impact assessment, benefit sharing, indigenous and local communities and sustainable use.

LESSONS LEARNED

- Integrated *Melaleuca* reforestation with agriculture is practicable, profitable and sustainable.
- Severely acidic soil should be managed as a natural wetland ecosystem to overcome problems of environmental degradation and economic loss.
- It is essential to work with individual farmers and address socio-economic priorities as the entry point for biodiversity recovery and environmental restoration.

Case Study 26

NON-TIMBER FOREST PRODUCTS IN LAO PDR: A PRACTICAL APPLICATION OF THE ECOSYSTEM APPROACH?

PROBLEM STATEMENT

This initiative sought to overcome two problems:

1. The unsustainable and inefficient use of Non-Timber Forest Products (NTFPs); and
2. The absence of incentives for local people to protect biological diversity.

DESCRIPTION

The NTFP Project can be categorised as an Integrated Conservation and Development Project (ICDP). Use of NTFPs has been promoted by the project with the aim of (1) alleviating poverty, food insecurity, and gender inequality; (2) conserving forests and landscapes/watersheds; and (3) developing sustainable forest-based commerce and industry. These objectives were pursued through action learning and participatory approaches. The project sought to increase stakeholder interest by promoting economic development and by involving local people in planning, management and benefit sharing. Key targets were:

1. Demonstration of sustainable NTFP use systems that contribute to conservation
2. Promotion of community-based organisations who manage NTFP/forest resources
3. Improvement of the well-being of pilot villages through promotion of alternative livelihoods to reduce pressure on forests/ build capacity for conservation
4. Improvement to the marketing of NTFPs to create incentives for sustainable use through improved income from forests
5. Development of an expansion strategy to spread sustainable NTFP use models
6. Laying the groundwork for a national management strategy for NTFPs

Achievements have been in four main areas:

1. community NTFP harvesting rules
2. NTFP marketing groups
3. domestication of NTFPs
4. aquatic resource management.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- Conservation, equitable sharing of benefits and sustainable use of the resources were simultaneously addressed.
- Conservation of ecosystem functioning and processes was an important objective as many NTFPs are dependent on particular ecosystem types. Measurement of off-take per unit of effort provided an indication of whether the forests were being managed within appropriate limits.
- Goods were identified as food, medicines and foreign exchange from trade in NTFPs. Services identified were watershed protection and eco-tourism potential.
- Promotion of trade in NTFPs benefits the poorest most as they depend on this income to buy rice.
- A combination of scales were found to be appropriate: villages were the most appropriate level of forest management, but higher level networking approaches were necessary for issues concerning trade regulations and inter-village agreements at district level.
- Intersectoral linkages were promoted through strategic arrangements with local institutions.
- A number of adaptive management strategies were tested, including: in-situ sustainable harvesting of NTFPs, ex-situ domestication of NTFPs to reduce pressure on wild resources, participatory management of forests by local communities and activities aimed at improving well-being of rural communities to reduce pressures on forests
- All Principles and Operational Guidelines were applied.
- Thematic area: biological diversity of forests, dry and sub-humid lands, inland waters, mountain areas and agriculture.
- Cross-cutting issues: indicators, incentives, impact assessment, benefit sharing, indigenous and local communities; sustainable use.

LESSONS LEARNED

- The NTFP approach is a good example of a practical application of the EA
- The NTFP approach could gain more rapid adoption beyond local levels by linking to regional and global approaches such as the EA.

Case Study 27

SIBERUT ISLAND NATIONAL PARK AND BIOSPHERE RESERVE: A FEASIBLE COMMITMENT?

PROBLEM STATEMENT

Sustainable use, conservation and cultural diversity are all threatened by outside economic pressures and newly devolved government.

DESCRIPTION

Siberut island (Indonesia) is a humid tropical island the western half of which is a National Park and a central portion of which is a Biosphere Reserve. Previous attempts to deliver sustainable development through an Integrated Conservation and Development Project (1992-1999) have largely failed as they were largely top-down approaches that placed unrealistic demands on the limited local capacity. New activities identify communities as the main actors managing the National Park and Biosphere Reserve and seek to build on the respect for local land tenure and resource rights established by the ICDP. Activities promoted by UNESCO-MAB, the National Park and a local NGO in cooperation with the local government and Adat (customary law) councils are small scale and based in buffer zones. These activities have been welcomed by the communities involved and aim to:

1. Support sustainable development
2. Increase the (locally defined) quality of life
3. Preserve the values of local societies
4. Avoid increasing conflicts between conservation and development.

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- Conservation, equitable sharing of benefits and the sustainable use of biological diversity are all addressed.
- The importance of preserving ecosystem functioning and inter-ecosystem linkages is recognised.
- Intersectoral cooperation is recognised to be a major obstacle to delivering the EA across the the whole island of Siberut as the management of various zones is the responsibility of different government sectors. However, intersectoral cooperation is not prioritised in current actions in which communities are identified as the main actors and beneficiaries. Private sector interests have not been directly considered yet. The lack of intersectoral cooperation is identified as a major obstacle to taking management decisions that consider the effect of actions on adjacent ecosystems. Extension of the Biosphere Reserve to cover the entire island and surrounding marine area is recommended as the best way of achieving integrated management.
- The participatory approach is key to achieving sustainable use but the importance of local communities working with other agencies is also emphasised. This partnership gives local communities a wider perspective on the implications of their choices.
- The activities have been developed with and promoted by local community members. Management is therefore decentralised. The current political changes in Indonesia influences decentralisation and the expression of societal choice. The creation and zonation of the National Park partially reflects societal choice but for this to be fully realised the opinions of Mentawaians (90% of the population) should have priority. It should be noted that outside economic influences such as logging activities are increasingly influencing societal choice.
- Balancing the need for long term objectives and short term economic gain is especially acute on Siberut. The devolution of administrative authority in the Siberut region has significantly increased demands for short-term revenue from logging.
- All Principles and Operational Guidelines were applied or considered.
- Thematic areas: forest and agricultural biological diversity.
- Cross-cutting issues: alien invasive species; incentive measures / perverse incentives; indigenous and local knowledge; NBSAP.

LESSONS LEARNED

- There is an urgent need to promote the EA and Biosphere Reserve concepts at all levels and among all stakeholders.
- The lack of an integrated approach to biodiversity management that covers the whole island is an obstacle to resolving the significant and acute tensions between conservation, sustainable use and development.
- Decentralisation in Indonesia is posing obstacles to implementation of the EA.

Case Study 28

CHENDEROH RESERVOIR, PERAK: ON THE CONSERVATION AND SUSTAINABLE USE OF AQUATIC RESOURCES IN A SERIALY DISCONTINUOUS RIVER CONTINUUM

PROBLEM STATEMENT

Reservoir construction has significantly altered the biodiversity and productivity of the Perak river ecosystem, Malaysia.

DESCRIPTION

Chenderoh Reservoir is the oldest and lowest of four cascading reservoirs. Initially, reservoir construction changed the assemblages of the reservoir fish fauna from fluvial to lacustrine and has impacted on the downstream biodiversity. However, over time the reservoir has become shallower and more productive, assuming the characteristics of wetlands with changes in the flora and fauna that reflect a shift to a mature reservoir ecosystem. Research was undertaken to determine the impact as well as the contribution of the reservoir construction on the biodiversity and productivity of the ecosystem. The ecosystem was studied by breaking it up into different subsystems; namely littoral, limnetic and tailwater. Biodiversity and productivity of the different subsystems were studied over a period of time. The impact of dam operation, vis-à-vis water management on the biodiversity and productivity were assessed. The help and cooperation of the local people were used especially with regards to the study on the historical state of the environment, fisheries and fish biodiversity, through the process of rapid rural appraisal (RRA).

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- Conservation, equitable sharing of benefits and sustainable use of the resources were simultaneously addressed.
- The study contributed to a greater ecological understanding of the reservoir and river ecosystems. It has shown the need to properly manage water level fluctuations during power generation in order to control the impact of water level management on the biology and ecology of aquatic life and support the breeding requirement of the fish community in and downstream of the reservoir.
- Goods and services were identified as: (1) electricity generation; (2) fisheries to the local community. Wider society has an interest in the sustainable management of the river-reservoir system as it benefits from the water supply. Local people benefit directly from fishing rights.
- Management that effectively balances conservation, sustainable use and equitable sharing of benefits of genetic resources requires intersectoral and multi-stakeholder decision making that takes into consideration the views of the local communities and, in this case, involves the power company, the fisheries authorities and the drainage and irrigation departments.
- Local communities are highly dependent economically on the fish resource and hence they effectively limit the fish catch to ensure that fishing is sustainable in the long term.
- Fish biodiversity is used as an indicator of ecosystem health and this data is the basis for adaptive management.
- The value of local knowledge and fish resource management practices in the form of community-based aquatic resource management (CBARM) was recognised.
- The study contributes to the National Biodiversity Strategy and Action Plan in that it demonstrates how to promote the sustainable and wise use of biological resources involving active participation of the local community.
- Principles 2, 3, 5, 9, 10, 11 and 12 were emphasised along with Operational Guidelines 1, 2, 3 and 5.
- Thematic areas: biological diversity of inland waters.
- Cross-cutting issues: indicators, benefit sharing, indigenous and local communities and sustainable use.

LESSONS LEARNED

- Indigenous and local knowledge of fish resources can be key to successful biodiversity conservation and management.
- Adaptive management is vital if local-level observations are to result in appropriate changes in management practices.

Case Study 29 ECOREGION CONSERVATION IN CAMBODIA, LAO PDR AND VIETNAM

PROBLEM STATEMENT

Conservation efforts continue to have limited effectiveness and hence many conservation organisations have begun to re-examine their current approaches and develop new strategies based on the identification of priority ecological regions. The Ecoregion approach of WWF recognises the need to give detailed consideration to the social and economic factors that constrain or provide opportunities for biodiversity conservation.

DESCRIPTION

The aim of Ecoregion conservation is to develop long term conservation programs that ensure the persistence of healthy ecosystems and species by mainstreaming conservation with natural resource management. Ecoregions are defined as areas with similar or interrelated ecological processes and characteristics. Ecoregion conservation can be useful as a planning tool because it provides a holistic view of major ecological processes and treats ecosystems as discreet units for management. Ecoregions differ from (site-based) Integrated Conservation and Development Projects as they allow for conservation planning and management at a broader scale. 233 Ecoregions (the Global 200) have been defined globally by WWF and conservation partners. Ecoregion conservation in Cambodia, Lao PDR and Vietnam are programmes consisting of a number of different projects which contribute directly to the overall programme goals:

- More effective conservation of the full range of biodiversity and promotion of its persistence within viable populations and sufficient habitat
- Mitigation of many significant threats to biodiversity operating at the scale of multiple sites
- Facilitation of coordinated regional efforts to ensure more effective and strategic use of limited resources for conservation
- Identify more accurately areas requiring specific habitat management interventions (e.g. forest restoration)
- Facilitate more effective communication of ecoregion conservation goals and activities to policymakers and the donor community

FEATURES OF CASE STUDIES THAT HIGHLIGHT KEY ASPECTS OF THE ECOSYSTEM APPROACH (DECISION V/6)

- Although the main emphasis of Ecoregions is conservation, the approach strives to simultaneously address conservation, equitable sharing of benefits and the sustainable use of resources.
- Understanding and conserving ecosystem functioning is key to Ecoregion conservation. Ecoregions consider entire ecological processes and root causes of biodiversity loss affecting many sites simultaneously.
- Goods and services and benefit sharing are not addressed although a situational analysis of key socio-economic trends and priorities has been undertaken.
- Ecoregions seek to recognise societal choice by involving the widest possible range of stakeholders in conservation planning and the involvement of local partners in conservation interventions.
- Ecoregion conservation seeks intersectoral cooperation through the mainstreaming of conservation with natural resource management and development.
- Ecoregion objectives are set for the long term.
- Ecoregions are defined according to global conservation priorities but recognise that on-the-ground actions must meet local priorities. In other words, the scale of management is decided by a combined top-down and bottom up approach. Interventions are made at various sub-regional scales while the Ecoregional vision applies at the regional scale.
- All Principles and Operational Guidelines were applied or considered.
- Thematic areas: all are relevant to the planned Ecoregion.
- Cross-cutting issues: all are relevant to the plan.

LESSONS LEARNED

- The Ecoregional approach to conservation represents one example of applying the EA.
- A key challenge to Ecoregional conservation is the linking of the (top-down) vision to the (bottom-up) everyday needs of people within the region.

VII. Appendix 2: The Ecosystem Approach under the CBD: towards implementation

Summary of a presentation given at the start of each Pathfinder workshop by Professor Edward Maltby (Chair of IUCN-CEM (1997-2000) and Director, Royal Holloway Institute for Environmental Research, UK).

1. What is the Ecosystem Approach?

The Ecosystem Approach is a strategy for management of land, water and living resources that promotes conservation and sustainable use in an equitable way.

Salient features

- There is no single or unique ecosystem approach
- The final goals of the approach acknowledge human participation and interests
- Emphasis is on maintaining the interactions within and functioning of natural systems
- The approach may be applied over a wide range of scales
- There may be many instances of applying an ecosystem approach without it being referred to as such

Alternative descriptions

- The ecosystem approach is a method for sustaining or restoring natural systems and their functions and values. It is goal driven, and is based on a collaboratively developed vision of desired future conditions that integrates ecological, economic and social factors. It is applied within a geographic framework defined primarily by ecological boundaries. *Interagency Task Force (1995).*
- The ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organisation which encompasses the essential processes and interactions among organisations and their environment. The ecosystem approach recognises that humans are an integral component of ecosystems. *Malawi (1998).*

2. An emerging new paradigm

The Ecosystem Approach symbolises an emerging new paradigm for the management of biological diversity, a paradigm that recognises:

- That different ecosystems with different functional and biodiversity characteristics can occupy the same global space
- Ecosystems are dynamic and respond to environmental as well as human-induced changes
- Human societies have been a key determinant of change since prehistoric times
- "Recombinant Biology" is likely to be increasingly important
- The importance of links between ecosystem functioning, natural resource use and economic and conservation strategies

The evolution in thinking among conservationists that has culminated in this new paradigm can usefully be illustrated by the changes in the strategies promoted by WWF (Table 1).

The key approaches to conservation promoted by WWF	
1960s	Single species management
1970-80s	Protected Areas
1990s	Integrated conservation and development projects
2000	Holistic, multi-stakeholder broad-scale approach (Ecoregion based conservation)

Table 8 WWF approaches to conservation, 1960 - 2000

3. Some steps in developing the Ecosystem Approach under the CBD

A number of discussions have preceded the *Pathfinder* workshops (Table 2). Some have been outside the CBD process but all have aimed to clarify and define the Ecosystem Approach. Perhaps the most significant highlight is the development of the twelve *Malawi Principles* that took account of the ten *Sibthorp Principles*. The twelve Principles of Decision V/6 are a modified form of the *Malawi Principles*.

The key distinguishing feature of the *Pathfinder* workshops is that they are the first effort directed towards turning the Ecosystem Approach from concept to practice within the specific context of the CBD.

Some steps in the development of the Ecosystem Approach under the CBD	
June '95	Inter-Agency Task Force, USA - outline framework; barriers
June '96	IUCN-Sibthorp Seminar, UK - 'traditional approach' questioned, 10 Principles formulated
Sep '96	Task Group, Canada - challenges identified; case studies
Oct '96	Keystone Policy Dialogue, USA - disparate values can be accommodated; recommendations for implementation
Sep '97	SBSTTA3 informal meeting - implications for CBD examined
Jan '98	Malawi workshop - 12 Principles
May '98	GBF 10, Bratislava - adaptive management
Nov '98	Vilm workshop - European case studies
April '99	Scottish Natural Heritage - integrated planning / different scales
May '99	IUCN-CEM technical mtg., Costa Rica - policy alignment needed
Sep '99	Norway/UN - improved understanding of the Malawi Principles
Sep '99	CBD Liaison Group - synthesis of progress
Feb '00	SBSTTA5 - recommends Malawi Principles and Operational Guidelines
May '00	COP5 - calls for case studies to assist application of the approach
Jul-Nov '00	Regional Pathfinder Workshops: <i>the Ecosystem Approach under the CBD, from concept to action</i>

Table 9 Steps in the development of the Ecosystem Approach

4. Objectives of regional pathfinder workshops

Use case studies and discussions to:

- build awareness within regions
- examine common and regionally specific constraints and opportunities
- examine appropriateness of the 12 Principles and 5 Operational Guidelines
- identify priorities (e.g. policy, planning, legal)
- assess if scientific understanding is sufficient to apply the Ecosystem Approach
- identify capacity building priorities
- suggest when other approaches are more appropriate

5. Expected possible outputs from the regional pathfinder workshops

- improved understanding among Parties and technical experts
- regional assessments and a global overview
- lessons and case studies to assist the CBD
- elaboration of Operational Guidelines
- guidelines for implementation
- integrate the approach into all CBD work
- guidance on integrating the Ecosystem Approach into wider policy
- capacity-building priorities
- priority measures needed for implementation

VIII. Appendix 3: Workshop participants

1) Southern Africa workshop

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Using an Ecosystem Approach to implement the CBD.

A global synthesis report drawing lessons from three regional pathfinder workshops.

R. D. Smith and E. Maltby

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IX. Appendix 4: Guidelines for the preparation of case studies

PREPARATION AND ANALYSIS OF CASE STUDIES

All presenters of case studies are required to submit a written version of their case study at or before the workshop. This need not be long; indeed you are encouraged to keep it as short as is practicable. These guidelines should help meet this objective. **All presenters are therefore requested to prepare their case studies using the following guidelines.** The use of these guidelines will help ensure that the assessment of case studies will meet the workshop objectives. We thank you in advance for your cooperation.

These guidelines have been adapted from those produced by the Secretariat of the CBD for other case studies. The use of this common framework is welcomed by the Secretariat of the CBD, as it will facilitate the synthesis of lessons learnt from these and other case studies, a key objective of this workshop.

INDICATIVE OUTLINE

Overview: In one page or less, please provide a summary of the case study using bullet points to highlight: the context/problem to be solved; the objectives; the approach; application of the Ecosystem Approach; and lessons learnt.

I. Background/Problem statement: Please describe the context or situation of the case study, and identify the problem that is addressed by the activities of the case. Consideration of threats to biological diversity, the goods and services derived from it, and the distribution of benefits among stakeholders may be included, and, if known, the underlying causes of such threats may be described.

II. Objectives/Purpose of the Activities: Please provide, in one or few sentences, the main objective(s) of the activities proposed and/or carried out.

III. Details of the case study and the approach taken: Please describe the activities, the approach taken, and the main actors involved.

IV. Analysis: Please analyse the case study in the framework of the Ecosystem Approach under the Convention and the various programmes of the Convention, using, as appropriate the following framework. (Note, this should be used as an aide memoir. It is not necessarily appropriate to address each and every part of the framework in each case). This section might be presented in tabular form, and should complement section III:

A. Application of the Ecosystem Approach.

1. Describe how the case study illustrates any of the **12 principles** of the Ecosystem Approach under the Convention (see Decision V/6, attached), and identify any constraints in applying these principles.
2. For the case study:
 - (a) Identify the **goods and services** provided by biodiversity in the area of case study (and additional ones that could be provided with improved management);
 - (b) Identify the **beneficiaries** of these goods and services, who should as well as additional groups be beneficiaries, their participation and barriers in the benefits;
 - (c) Describe approaches to **adaptive management** noting, what works and what does not;
 - (d) Describe **scale(s) of management**, used, additional scale(s) of management needed to address the problem, and any barriers to exercising management at the appropriate scales.

- (e) Identify **sectors** involved, and those that should be involved, and identify changes required to provide an enabling policy environment.

B. Relevance to the thematic work programmes of the Convention

Indicate whether or not the case study is relevant to the following thematic areas, and if possible how they are relevant:

- (a) **Forest** biological diversity
- (b) **Marine and Coastal** biological diversity
- (c) Biological diversity of **inland waters**
- (d) Biological diversity of **dry and sub-humid lands** (including Mediterranean, Savannah and Grasslands)
- (e) Biological diversity of **mountain areas**
- (f) **Agricultural** biological diversity

C. Relevance to the cross-cutting work programmes of the Convention

- (a) Indicate whether or not the case study is relevant to the identification, control or mitigation of the effects of **invasive alien species**.
- (b) Indicate whether or not the case study employs **indicators** of biological diversity, or of impacts on biological diversity.
- (c) Indicate whether the case study employs the use of incentive measures, or identifies perverse **incentives**.
- (d) Indicate whether the case study employs **impact assessments** (environmental, socio economic) or indicates the need for impact assessments.
- (e) Indicate whether the case study employs the use of **benefit-sharing** measures.
- (f) Indicate whether the case study draws upon the knowledge, innovations and practices of **indigenous and local communities** and whether it contributes to the protection and wider application of such knowledge, innovations and practices.
- (g) Indicate any other measures taken to promote the **sustainable use** of biological diversity.
- (h) Indicate if the case study is part of, or contributes to, a **National Biodiversity Strategy and Action Plan**.

V. Conclusions.

- A. Outcome of the activities.** Please provide a brief note of the results, or expected results, of the case study, and the extent to which the objectives were met.
- B. Lessons Learnt.** Please highlight any critical factors that led to the success or failure of any of the activities carried out. It would be useful to note any practical conclusions that would assist others in carrying out similar activities, as well any policy-relevant lessons.