

The Ecosystem Approach

Advanced User Guide

1. Introduction

This guide provides information how to apply the ecosystem approach to a project or issue. It does not set out **exactly** how to deliver the three objectives of the Convention through the ecosystem approach. Instead, it explains the type of actions that need to be taken and why these are important for meeting all the principles of the ecosystem approach.

Much can be learnt from the experiences of others when using the ecosystem approach as a basis for projects and programmes. The searchable component of the ecosystem approach sourcebook can be used in addition to this guide to find information on case studies and tools which have been used to meet the principles of the ecosystem approach (<https://www.biodiv.org/programmes/cross-cutting/ecosystem/sourcebook/search.shtml>).

The ecosystem approach is a tool; it provides a framework that can be used to implement the objectives of the CBD, including the work on, inter alia, protected areas and ecological networks. There is no single correct way to apply the ecosystem approach to management of land, water, and living resources. The principles that underlie the ecosystem approach should be translated flexibly to address management issues in different social, economic and environmental contexts. Already, there are sectors and governments that have developed guidelines that are partially consistent, complementary or even equivalent to the ecosystem approach (e.g. the Code for Responsible Fisheries, the Sustainable Forest Management approach, adaptive forest management). These and the case studies in the searchable component of the sourcebook provide examples of how the ecosystem approach can be used in practice.

There are a number of options for implementing the ecosystem approach. One is the incorporation of its principles into the design and implementation of national and regional biodiversity strategies and action plans. Others include incorporation of the ecosystem approach principles into policy instruments, planning processes, and sectoral plans (e.g., in forest, fisheries, agriculture). At a more local level the principles of the ecosystem approach can be used to guide the development and implementation of individual projects and plans.

This guide explains how the ecosystem approach could be used to address issues that affect the management of land, water and living resources. The following sections cover, steps to using the ecosystem approach (Section 2), Applying the ecosystem approach (Section 3), creating a management plan (Section 4) and assessing a project against the ecosystem approach (Section 5).

2. Steps to using the ecosystem approach

Problem Definition

The first task is to define the problem or problems that need to be addressed. If the problem is very complex it might be necessary to break it down into several smaller problems so that each can be addressed more easily. For example, to conserve a

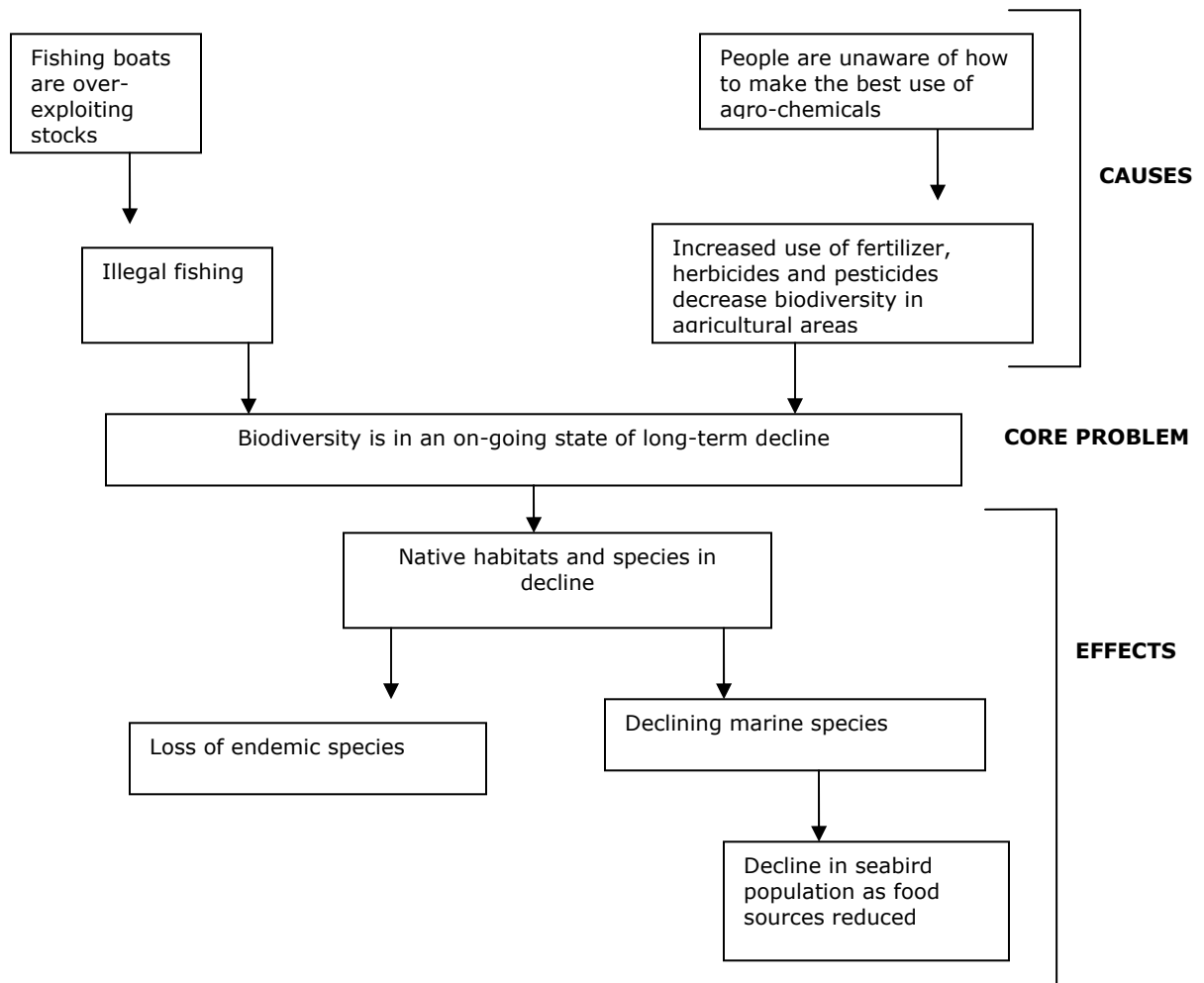
wetland ecosystem while facilitating its sustainable use, it might be necessary to address i. ecological degradation resulting from unsustainable use of wetland resources, and ii. community well-being such as health, education, food security, and cultural values.

In some cases the problems may not be related to a practical management activity. For example, encouraging the adoption of the ecosystem approach into national and regional legislation or policies. In these circumstances an analysis of the potential policy outcomes can be assessed against the ecosystem approach principles as a way of determining what actions are necessary.

Whatever the issue at hand the use of tools such as decision and problem trees can be extremely useful. These can be used to understand what issues need to be addressed and the linkages between them, see Figure One

The problem tree below illustrates how the decline of biodiversity within a particular area might be a product of several other problems.

Figure One – Example of a problem tree



Having identified the issues, the next step is to ascertain what tasks would allow the problem to be addressed. At this point it will be necessary to have identified the problem and to have broken it down into smaller units if it covers a range of issues. The problem can be assessed against the tasks listed below as an initial step towards identifying a plan of action. This process can be used to prioritise the actions to be undertaken.

The tasks below have been drawn from the principles of the ecosystem approach. In each case the ecosystem approach principle has been rephrased into a question which can be asked in relation to the problem(s) being addressed. After each question there is information which explains why considering certain actions would lead to potentially beneficial outcomes (taken from UNEP/CBD/SBSTTA/9/INF/4). The tasks are not listed in order of importance they should be addressed in a way which best fits the problem.

It is important to remember that whilst there is no single correct way to implement

the ecosystem approach, it should be stressed that all the tasks listed below need to be considered together, and appropriate weight given to each, according to individual circumstances. This means that it might sometimes appear that some tasks have higher priority than others, and some may not be regarded as essential to the issue being addressed. When a particular task is not thought to be important for addressing an issue a reason for this should be assigned so as to understand why that decision was taken – this can become a useful tool when evaluating the project outcomes at a later date. Throughout the life of the project it might also be necessary to revisit the tasks to check whether other actions could be taken to address emerging issues.

Often an activity will address more than one task (and therefore more than one ecosystem approach principle). For example, involving stakeholders in decision making processes would meet the following tasks

- Task 1 Involving all members of society in decisions associated with the management of land, water and living resources
- Task 2 Ensuring management is decentralised to the lowest appropriate level
- Task 4 Ensuring the economic context can be understood
- Task 6 Considering what measures can be taken to ensure ecosystems are managed within the limits of their functioning
- Task 9 Using adaptive management to address the problem(s) identified
- Task 10 Seeking an appropriate balance between, and integration of, conservation and use of biological diversity
- Task 11 Ensuring all forms of relevant knowledge including, scientific, indigenous and local knowledge, innovations and practices are included
- Task 12 Facilitating the involvement of all stakeholders including all sectors of society and scientific disciplines

This means there are often links between the tasks and the actions taken. By using the ecosystem approach it is possible to identify how one activity could be used for several purposes. This can strengthen the project or programme outcomes and alert those involved in the project to additional factors which might be useful to the entire process.

Under each Task there is a list of tools which can be used to meet the actions required. Further information on the tools can be found within the Ecosystem Approach Sourcebook at <http://www.biodiv.org/programmes/cross-cutting/ecosystem/sourcebook/tools.shtml>, for many there is a link from the tool to guidance on its use. You can also add tools to the sourcebook to share with others your experiences and methods see <http://www.biodiv.org/programmes/cross-cutting/ecosystem/sourcebook/search.shtml>.

At the end of Section Three a table has been developed to help with the application of the ecosystem approach to a particular project. This can be used by project managers to determine if their project meets all twelve tasks, and if not the reasons why this was the case.

3. Applying the Ecosystem Approach

The Tasks

Task 1. How do you involve all members of society in decisions associated with the management of land, water and living resources?

Explanation

Different sectors of society view ecosystems in terms of their own economic, cultural and societal needs. Indigenous peoples and other local communities living on the land are important stakeholders and their rights and interests should be recognized. Both cultural and biological diversity are central components of the ecosystem approach, and management should take this into account. Societal choices should be expressed as clearly as possible. Ecosystems should be managed for their intrinsic values and for the tangible or intangible benefits for humans, in a fair and equitable way.

Guidelines for meeting this task

Involve all stakeholders (interested parties) (including indigenous and local communities) in:

clearly articulating, defining and agreeing upon the goals of management
defining problems
making choices (see Task 12).

There need to be clearly defined boundaries (in time and space, see Task 7) for the area being managed so that those involved are fully aware of the range/limitation of the management processes.

Ensure that those stakeholders that cannot directly represent themselves (e.g. future generations, the natural world) are adequately represented by someone else.

Ensure that all stakeholders have an equitable capacity to be effectively involved, including equitable access to information, ability to participate in the processes, etc.

Ensure that the decision-making process compensates for any inequities of power in society, so that those who are normally marginalized (e.g. women, the poor, indigenous people) are not excluded or stifled in their participation.

Make sure all actions are transparent to everyone concerned. This includes identifying who the decision-makers are for each decision, how the decisions will be taken (what process will be used), and what are the limits on the discretion of the decision-maker (e.g. what are the criteria for the decision in law, and where applicable what is the overall policy guidance within which the decision must fit).

Ensure that the recognition of stakeholder interests occurs within the full range of decisions over time and space and across the different levels (eg local and national government). In doing so, however, ensure that "stakeholder fatigue" does not develop, by incorporating known stakeholder views into future decisions, and allowing efficient stakeholder input.

Where possible, use existing societal mechanisms (eg existing local groups), or build new mechanisms that are compatible with existing or desired societal conditions.
Ensure that decision-makers are accountable to the appropriate communities of

interest.

Develop within the project team the capacity to broker negotiations and trade-offs, and manage conflicts among relevant stakeholder groups in reaching decisions about management, use and conservation of biological resources.

There need to be mechanisms in place to ensure that, once an appropriate societal choice has been made, the decision can be implemented over the long term, (eg policy, legislative and control structures need to be in place).

Tools

Tools that can be used to ensure all members of society are involved in decisions associated with the management of land, water and living resources include:

Workshop based methods

Community based methods

Methods for stakeholder consultation

Local community approaches

Social analysis

Conflict management methods

Further explanation

The objectives for managing land, water, and living resources are a matter of societal choice, determined through negotiations and trade-offs among stakeholders who have different perceptions, interests, and intentions. In this regard it should be noted that:

Human society is diverse in the kind and manner of relationships that different groups have with the natural world, each viewing the world around them in different ways and emphasizing their own economic, cultural, and societal interests and needs. All relevant sectors of society need to have their interests equitably treated, which may involve providing for different outcomes in separate locations or at different times. It is also necessary to ensure that the needs of future generations and the natural world are adequately represented. Given this diversity, good decision-making processes that provide for negotiations and trade-offs are necessary to establish broadly acceptable objectives for the management of particular areas and their living resources.

Good decision-making processes incorporate the following characteristics:

- All interested parties (particularly including indigenous and local communities) should be involved in the process, It needs to be clear how decisions are reached and who the decision-maker(s) is (are),
- The decision-makers should be accountable to the appropriate communities of interest,
- The criteria for decisions should be appropriate and transparent, and
- Decisions should be based on, and contribute to, inter-sectoral communication and co-ordination.
- Good decisions depend on those involved having access to accurate and timely information and the capacity to apply this knowledge.

Task 2. How do you ensure management is decentralised to the lowest

appropriate level?

Explanation

Management which is decentralised to the lowest appropriate level may lead to greater efficiency, effectiveness and equity. Management should involve all stakeholders and balance local interests with the wider public interest. The closer management is to the ecosystem, the greater the responsibility, ownership, accountability, participation, and use of local knowledge.

Guidelines for answering this question

The multiple communities of interest should be identified, and decisions about particular aspects of management assigned to the body that represents the most appropriate community of interest. If necessary, management functions/decisions should be subdivided. For example, strategic decisions might be taken by central government, operational decisions by local government or a local management agency, and decisions about allocation of benefits between members of a community by the community itself.

The potential adverse effects of fragmented decision-making and management responsibilities should be compensated for by:

- ensuring that decisions are appropriately nested and linked
- sharing information and expertise
- ensuring good communication between the different management bodies
- presentation of the overall combination of decisions/management to the community in an understandable and consolidated form so its members can effectively interact with the overall system
- supportive relationships between the levels

Good governance arrangements are essential, particularly clear accountabilities of the necessary authorities, and accountabilities of competent bodies or persons

Achieving an appropriate level of decentralisation requires taking decisions at a higher level to create an enabling and supportive environment, as well as a commitment to devolve those decision-making responsibilities that are currently situated at too high a level.

In choosing the appropriate level of decentralisation, the following are relevant factors that should be taken into account in choosing the appropriate body. .

- whether the body represents the appropriate community of interest
- whether the body has a commitment to the intent of the function
- whether the body has the necessary capacity for management efficiency (e.g. moving a function to a higher level may allow maintenance of the necessary level of expertise to do the function efficiently and effectively)

- whether the body has other functions which represent a conflict of interest
the effect on marginalised members of society (e.g. women, marginalised tribal groups)

In some cases problems could be corrected through capacity-building. If no appropriate body is available at the level of engagement (eg local, regional or national), a new body might need to be created, or an existing body modified, or a other methods of engagement sought.

Where functions are to be created or given to an existing body, it is necessary to ensure that the body receiving the responsibility has sufficient capacity to fulfil that responsibility (e.g. resources, systems, authority), and that any risks arising from the transition can be managed. This might require further capacity-building if the decentralisation to occur.

Institutional arrangements are the key. If the institutional structure that supports and co-ordinates the decision-making authorities is missing, then their work may be worthless.

Tools

Tools that can be used to ensure management is decentralised to the lowest appropriate level include:

Workshop based methods

Community based methods

Methods for stakeholder consultation

Local community approaches

Social analysis

Conflict management methods

Tools for decentralising money and staff resources

Mechanisms for identifying the appropriate community of interest

Tools for building institutional capacity

Further Explanation

Decisions should be made by those who represent the appropriate communities of interest, while management should be undertaken by those with the capacity to implement the decisions. In this regard it should be noted that:

There are usually many communities who have an interest in the management of an ecosystem. These interests can be compatible, complimentary, or contradictory. It is important to ensure that the level of decision-making and management selected maintains an appropriate balance among the interests.

Often, but not always, the closer the decision-making and management are to the ecosystem, the greater the participation, responsibility, ownership, accountability and use of local knowledge will be, all of which are critical to the success of management.

Because there are several levels of interests with people who have varying capacities to address different aspects of ecosystem management, there are often multiple decision-makers and managers with different roles for any individual place or resource.

Decisions made by local resource managers are often affected by, or even subordinate to, environmental, social, economic and political processes that lie outside their sphere of influence, at higher levels of organisation. Therefore there is a need for mechanisms to coordinate decisions and management actions at a number of different organisational levels (ie between national, regional and local).

Task 3. How do you ensure the effects of management actions (potential or actual) on adjacent and other ecosystems are taken into account?

Explanation

Management interventions in ecosystems often have unknown or unpredictable effects on other ecosystems; therefore, possible impacts need careful consideration and analysis. This may require new arrangements or ways of organization for institutions involved in decision-making to make, if necessary, appropriate compromises.

Guidelines for answering this question

Natural resource managers, decision makers and politicians should consider the possible effects that their actions could have on adjacent and downstream ecosystems (river basins and coastal zones) so that effects inside and outside the ecosystem are determined.

Where management or use of one ecosystem has or is projected to have effects elsewhere, bring together relevant stakeholders and technical expertise to consider how best to minimize adverse consequences.

Environmental impact assessment (EIAs), including strategic environmental assessments (SEAs) should be carried out for all developments taking into account all the components of biological diversity. These assessments should adequately consider the potential offsite impacts. The results of these assessments, which can also include social impact assessment, should be acted upon. When identifying existing and potential risks or threats to an ecosystem, different scales need to be considered.

Establish and maintain national and regional monitoring systems to measure the effects of selected management actions across ecosystems (see also Task 5).

Develop specific mechanisms to address transboundary issues associated with shared ecosystems and with transboundary transfer of ecological impacts (e.g. air and water pollution).

Tools

Environmental Impact Assessment (EIA)
Strategic Environmental Assessment (SEA)
Policy, planning and decision making systems
Modelling
Ecological networks
Protect area system frameworks
Integrated land use planning

Further explanation

Ecosystems are not closed systems, but rather open and often connected to other ecosystems. This open structure and connectedness of ecosystems means that

effects on ecosystem functioning are seldom confined to the point of impact or only to one system. In this regard it should be noted that:

The effects of management interventions, or decisions not to intervene, are therefore not confined solely to the point of impact.

The effects between ecosystems are frequently non-linear and are likely have associated time-lags.

Management systems need to be designed to cope with these issues.

There is a need for this to reflect the fact that impacts are in both directions – into and out of a particular ecosystem. Not just adjacent and downstream, but there are other connections as well (e.g. systems linked by migratory species).

Task 4. How can the economic context be understood so that

- ***Market distortions that affect biological diversity are reduced***
- ***Incentives are developed to promote biodiversity and sustainable use***
- ***Ecosystem costs and benefits are externalised?***

Explanation

The greatest threat to biological diversity lies in its replacement by alternative systems of land use. This often arises through market distortions, which undervalue natural systems and populations and provide perverse incentives and subsidies to favour the conversion of land to less diverse systems. Often those who benefit from conservation do not pay the costs associated with conservation and, similarly, those who generate environmental costs (e.g. pollution) escape responsibility. Alignment of incentives allows those who control the resource to benefit and ensures that those who generate environmental costs will pay.

Guidelines for answering this question

- Develop an understanding of the social and economic context of the issue to which the ecosystem approach is being applied.
- Apply appropriate practical economic valuation methodologies for ecosystem goods and services (direct, indirect and intrinsic values); and for the environmental impacts (effects or externalities).
- Aim to reduce those market distortions that adversely affect biological diversity and align economic and social incentives to promote biodiversity conservation and sustainable use. Internalize costs and benefits in the given ecosystem to the extent feasible.
- Evaluate the direct as well as indirect economic benefits associated with good ecosystem management including biodiversity conservation and environmental quality.
- Enhance benefits of using biological diversity.
- Ensure equitable sharing of costs and benefits.

- Incorporate social and economic values of ecosystem goods and services into national accounts, policy, planning, education and resource management decisions.

Tools

Participatory methods (see Task 1)

Environmental Impact Assessment (EIA)

Environmental valuation methods

Development of markets for ecosystem services

Further explanation

Many ecosystems provide economically valuable goods and services and it is therefore necessary to understand and manage ecosystems in an economic context. Economic systems generally do not make provision for the many, often, intangible values derived from ecological systems. In this regard it should be noted that:

- Ecosystem goods and services are frequently undervalued in economic systems.
- Even when valuation is complete, most environmental goods and services have the characteristic of “public goods” in an economic sense, which are difficult to incorporate into markets.
- It is often difficult to introduce new uses of ecosystems, even where these are less impacting or provide wider benefits to society, because economic and social systems exhibit significant inertia, particularly where strong existing interests are affected by and resist change.
- Many stakeholders with strong interests in the ecosystem, but having limited political and economic influence, may be marginalized from the relevant economic systems.
- Where those who control use of the land do not receive benefits from maintaining natural ecosystems and processes, they are likely to initiate unsustainable land use practices from which they will benefit directly in the short term. To counter this more equitable sharing of benefits is advised.
- International, national and sub-national policies, laws and regulations, including subsidies may provide perverse incentives for unsustainable management of ecosystems. Economic systems therefore need to be redesigned to accommodate environmental management objectives.
- Addressing the issue of market distortions that adversely affect biodiversity will require establishing dialogue with other sectors.

Deriving economic benefits need not be inconsistent with attaining biodiversity conservation and improvement of environmental quality, provided that incentives are properly aligned.

Task 5. What measures could be used to conserve ecosystem structure and functioning so as to maintain ecosystem services?

Explanation

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

protection of species.

Guidelines for answering this question

There needs to be an improved understanding of the interrelationship between ecosystem composition, structure and function with respect to (i) human interaction, needs and values (including cultural aspects), (ii) conservation management of biodiversity, and (iii) environmental quality, integrity and vitality.

Determine and define conservation, social and economic objectives and goals that can be used to guide policy, management and planning using participatory processes.

Assess the extent to which ecosystem composition, structure and function contribute to the delivery of goods and services to meet the desired balance of conservation, social and economic outcomes.

Expand knowledge of the responses of ecosystems, in terms of changes in composition, structure and function, to both internally and externally induced stresses caused by, *inter alia*, human use, disturbance, pollution, fire, alien species, disease abnormal climatic variations (drought, flood) etc.

Develop and promote management strategies and practices that enable and ensure conservation of ecosystem services and take account of, or minimize, risks/threats to ecosystem function and structure.

Apply instruments to maintain and/or restore ecosystem services.

Where required, develop management strategies and practices to facilitate recovery of ecosystem structure and function (including threatened components) to generate or enhance ecosystem services and biodiversity benefits.

Develop and apply instruments that contribute to achievement of conservation management goals through a combination of managing protected area networks, ecological networks and areas outside of such networks to meet both short-term and long-term requirements and conservation outcome.

Monitoring of population sizes of vulnerable and important species should be linked to a management plan that identifies appropriate response measures and actions.

Tools

Interdisciplinary research

Monitoring methods

Legislation and policy

Management and restoration plans

Protected areas

Further explanation

Biodiversity conservation and the maintenance of human wellbeing depend on the functioning and resilience of natural ecosystems. In this regard it should be noted that:

- Ecosystem services – the benefits people obtain from ecosystems by way of resources, environmental regulation including, support of biospheric

processes, inputs to culture, and the intrinsic values of the systems themselves – depend on maintaining and, where appropriate, restoring particular ecological structures and functions.

- Ecosystem functioning and resilience depend on inter-relationships within and among species, between species and their abiotic environments, and on the physical and chemical interactions within these environments.
- Given this complexity, management must focus on maintaining, and where appropriate restoring, the key structures and ecological processes (e.g., hydrological systems, pollination systems, habitats and food webs) rather than just individual species.
- Given that the loss of genetic diversity predisposes populations and species to local extinction, the conservation of ecosystem composition and structure requires monitoring of population sizes of vulnerable and economically important species.

Management of ecosystem processes has to be carried out despite incomplete knowledge of ecosystem functioning.

Task 6. What measures can be taken to ensure ecosystems are managed within the limits of their functioning?

Explanation

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

Guidelines for answering this question

Identify practices that are not sustainable and develop appropriate mechanisms for improvement involving all stakeholders.

Given the uncertainty associated with defining the limits to ecosystem functioning under most circumstances, the precautionary principle should be applied.

Implement an adaptive management approach (see Task 9).

Develop understanding of the limits of ecosystem functioning and the effects of various human use on the delivery of ecosystem goods and services.

Where permissible limits to alteration of specific ecosystem components can be agreed, manage within these limits but monitor and assess the ecosystem response. Make sure the information is given at regular intervals to those responsible for setting the off-take or other limits.

Encourage the use of environmental assessments and monitoring to establish ecosystem responses to disturbance, in order to provide management feedback and develop appropriate responses.

Develop and promote appropriate management strategies and practices that sustain resources and maintain ecosystems within the limits of their functioning.

Sustainable use management goals and practices should avoid or minimize adverse impacts on ecosystem services, structure and functions as well as other components of ecosystems.

Formulate, review and implement regulatory frameworks, codes of practice and other instruments to avoid using ecosystems beyond their limits.

Tools

Monitoring methods

Interdisciplinary research

Public participation

Further explanation

There are limits to the level of demand that can be placed on an ecosystem while maintaining its integrity and capacity to continue providing the goods and services that provide the basis for human wellbeing and environmental sustainability. Our current understanding is insufficient to allow these limits to be precisely defined, and therefore a precautionary approach coupled with adaptive management, is advised. In this regard it should be noted that:

- Just as there are limits to the demands (production, off-take, assimilation, detoxification) that can be made on ecosystems, so too there are limits to the amount of disturbance that ecosystems can tolerate, depending on the magnitude, intensity, frequency and kind of disturbance.
- These limits are not static but may vary across sites, through time, and in relation to past circumstances and events.
- Cumulative effects of interventions over time and space should be assessed when considering ecosystem limits. If these limits are exceeded, an ecosystem undergoes substantial change in composition, structure and functioning, usually with a loss of biodiversity and a resulting lower productivity and capacity to process wastes and contaminants.
- There is considerable lack of knowledge and uncertainty about the actual limits (thresholds for change) in different ecosystems. While further research can reduce these uncertainties, given the dynamic and complex nature of ecosystems we may never have perfect understanding.
- Given the pervasiveness of uncertainties in managing ecosystems, management will need to be adaptive, with a focus on active learning derived from monitoring the outcomes of planned interventions using a sound experimental approach that allows the effects of the intervention to be accurately determined.
- Management to restore lost capacities or control use should be appropriately cautious and apply an adaptive management approach.

Task 7. What actions can be taken so that the problem(s) is (are) addressed at the appropriate temporal and spatial scales?

Explanation

Appropriate spatial and temporal scales should be used to address the problem identified. The ecosystem approach can be applied to issues of any scale. The approach recommends the problem being addressed should set the scale of analysis and action. For example it could be applied to a pond, a forest, a global flyway or the whole globe. The time taken for ecosystems to respond to management changes (positively and negatively) need to be taken into account in any actions taken. Boundaries for management are defined operationally by users, managers, scientists and indigenous and local peoples. Connectivity between areas should be promoted where it is necessary to address the problem encountered.

Guidelines for answering this question

Enhanced understanding is required to analyse and understand the temporal and spatial scales at which ecosystem functions operate, and the effect of management actions on these processes and the delivery of ecosystem goods and services. Identification of spatial patterns and gaps in connectivity should be included in this analysis.

Functional mismatches in the administration and management of natural resources should be avoided by readjusting the scale of the institutional response to coincide more closely with spatial and temporal scales of processes in the area under management. This logic underpins the current global trend towards decentralized natural resource management.

Given that ecosystem components and processes are linked across scales of both time and space, management interventions need to be planned to transcend these scales. Developing a nested hierarchy of spatial scales may be appropriate in some circumstances.

Managing large areas such as river basins or large marine areas may require development of new institutional mechanisms to engage stakeholders across administrative borders and different levels of administration.

Attention to spatial and temporal scales is needed in the design of assessment and monitoring efforts.

Concepts of stewardship, intergenerational equity and sustainable yield need to be applied to considerations of the temporal scale.

Regional collaboration is necessary to deal with large-scale changes.

Tools

Monitoring methods
Modeling
Public participation

Further explanation

The driving forces of ecosystems, including those due to human activities, vary spatially and through time, necessitating management at more than one scale to meet management objectives. In this regard it should be noted that:

- Ecosystems are made up of biotic and abiotic components and processes, which function at a range of spatial and temporal scales, within a nested hierarchy.
- The dynamics of human social and economic systems also vary across scales of space, time and quality.
- How components are perceived spatially depends partly on the scale of observation. At one scale, individuals of a species may seem relatively regularly and continuously distributed; at another the distribution may be discontinuous. Likewise, at one time scale (e.g., monthly, annually) a component or process may appear predictable; at another, longer or shorter time scale, the temporal dynamics may be unpredictable.
- Management processes and institutions should be designed to match the scales of the aspects of the ecosystem being managed. More importantly, perhaps, given that ecosystem components and processes are linked across scales of both space and time, management interventions need to be planned to transcend these scales.
- Failure to take scale into account can result in mismatches between the spatial and time frames of the management and those of the ecosystem being managed. For example, policy makers and planners usually consider shorter time frames than the time frames of major ecosystem processes. The reverse can also be true, for example, where bureaucratic inertia can delay the quick management response needed to address a rapidly changing environmental condition. Spatial mismatches are also common, such as when administrative boundaries and those of ecosystem properties or related human activities that they are designed to regulate do not coincide.

Task 8. How can varying temporal scales and lag-effects be taken into account when considering the sustainable use of ecosystems?

Explanation

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

Guidelines for answering this question

Adaptive management processes should include the development of long-term visions, plans and goals that address inter-generational equity, while taking into account immediate and critical needs (e.g., hunger, poverty, shelter).

Adaptive management should take into account trade-offs between short-term benefits and long-term goals in decision-making processes.

Adaptive management should take into account the lag between management actions and their outcomes.

Monitoring systems should be designed to accommodate the time scale for change in the ecosystem variables selected for monitoring. Alternatively, if the monitoring cannot be adjusted, a more appropriately scaled but still relevant variable should be selected to monitor.

The capacity to monitor and detect long-term, low frequency changes in ecosystem structure and functioning should be strengthened.

To implement long-term management requires stability of institutions, legal and policy frameworks, monitoring programs, and extension and awareness-raising programs.

Tools

Monitoring methods

Modeling

Information exchange

Further explanation

Time needs to be considered explicitly in formulating management plans, and in longer-scale processes need to especially considered and planned for because these are otherwise often neglected. In this regard it should be noted that:

- People find long-term trends more difficult to detect than short term trends, particularly in complex systems.
- Management systems tend to operate at relatively short time scales, often much shorter than the timescales for change in ecosystem processes.
- Where there is a lag between management actions and their outcomes, it is difficult to take reasoned management decisions.
- Long-term ecological processes, which can be very important, are therefore likely to be poorly accommodated in management systems, unless these are explicitly and carefully designed to address long-term issues.
- Awareness of long-term processes is important because it is the long-term, spatially, extensive processes that both characterize and determine the broad ecosystem properties.

Task 9. How can adaptive management be used to address the problem(s) identified?

Explanation

Ecosystems change, including species composition and population abundance. Hence, management should adapt to the changes. Apart from their inherent dynamics of change, ecosystems are beset by a complex of uncertainties and potential "surprises" in the human, biological and environmental realms. Traditional disturbance regimes may be important for ecosystem structure and functioning, and may need to be maintained or restored. The utilization of adaptive management is necessary to anticipate and cater for such changes and events. There should be caution in making any decision that may foreclose future options, but at the same time, consideration should be given to mitigating actions that will enable adaptation to long-term changes such as climate change.

Guidelines for answering this question

Adaptive management is needed to respond to changing social and ecological conditions, and to allow management plans and actions to evolve in light of experience.

Natural resource managers must recognize that natural and human-induced change is inevitable and take this into account in their management plans.

Adaptive management should be encouraged when there is a risk of degradation or loss of habitats, as it can facilitate taking early actions in response to change.

Monitoring systems, both socio-economic and ecological, are an integral part of adaptive management, and should not be developed in isolation from the goals and objectives of management activities.

Adaptive management must identify and take account of risks and uncertainties.

Where changes occur across national borders, the scale of adaptive management may need to be adjusted.

While ecosystems are inherently dynamic and resilient, special adaptation and mitigation measures are needed for human-induced problems such as climate change that may push ecosystems beyond the limits of natural variation. Capacity-building efforts are needed to address highly vulnerable areas such as small island states and coastal areas.

Traditional knowledge and practice should be used to enable better detection and understanding of ecosystem change, and to develop appropriate adaptation measures.

Adaptive management should recognize the resilient capacity of ecosystems in response to natural disturbances, and should be aimed at maintaining or restoring this capacity so as to reduce the risk of adverse social and economic consequences of natural variability in ecosystems.

Awareness-raising measures are needed to enhance public knowledge that ecosystem change is a natural phenomenon, and to build support and capacity for adaptive management.

Tools

Monitoring methods

Modeling

Participation programmes

Further explanation

Change in ecosystems is both natural and inevitable, and therefore management objectives should not be construed as fixed outcomes but rather the maintenance of natural ecological processes. In this regard it should be noted that:

- Ecosystems change constantly as a result of natural processes. Those changes include shifts in species composition, population abundance, and physical characteristics.
- Such changes are not necessarily constant, rather they are variable, dynamic and usually difficult to predict at any point in time.
- It is therefore difficult to select an appropriate outcome or future state of an ecosystem as a static management goal. Instead, in addressing this and Task 8, management should focus on maintaining the natural processes, which drive those changes.
- This focus on processes requires a management approach that is flexible and adaptive, both as a response to changing circumstances and to take account of new knowledge and understanding. Adaptive management should generate new knowledge and reduce uncertainties, thereby allowing the manager to anticipate and cater for change.

- Ecosystem management must therefore involve a learning process that will help to adapt methods and practices to improve the ways in which these systems are being managed and monitored. Flexibility is also needed in policy-making and implementation. Long-term, inflexible decisions are likely to be ineffective or detrimental.

Task 10. How can an appropriate balance be sought between, and integration of, conservation and use of biological diversity?

Explanation

Biological diversity is critical both for its intrinsic value and because of the key role it plays in providing the ecosystem and other services upon which we all ultimately depend. There has been a tendency in the past to manage components of biological diversity either as protected or non-protected. There is a need for a shift to more flexible situations, where conservation and use are seen in context and the full range of measures are applied in a continuum from strictly protected to human-made ecosystems.

Guidelines for answering this question

Integrated natural resource management systems and practices need to be developed to ensure the appropriate balance between, and integration of, the conservation and use of biological diversity, taking into account long- and short-term, direct and indirect, benefits of protection and sustainable use as well as management scale.

Develop policy, legal, institutional and economic measures that enable the appropriate balance and integration of conservation and use of ecosystems components to be determined.

Promote participatory integrated planning, ensuring that the full range of possible values and use options are considered and evaluated.

Seek innovative mechanisms and develop suitable instruments for achieving balance appropriate to the particular problem and local circumstances.

Manage areas and landscapes in a way that optimizes delivery of ecosystem goods and services to meet human requirements, conservation management and environmental quality.

Determine and define sustainable use objectives that can be used to guide policy, management, and planning, with broad stakeholder participation.

Identify solutions which relieve sectoral pressure on existing resources.

Tools

Environmental assessment tools
Environmental accounting
Public participation

Further explanation

Biological diversity provides ecosystem goods and services on which humans ultimately depend. In this regard it should be noted that:

- The ecosystem approach is designed to support the conservation of biodiversity, the sustainable use of its components, and the equitable sharing of benefits derived from the use of biodiversity.
- Sustainable use and management depends on also achieving conservation objectives.
- Management for conservation and sustainable use are not inherently incompatible, and can potentially be integrated.
- Integration can be achieved at various scales and in various ways including both spatial and temporal separation across the landscape as well as through integration within a site.

Task 11. How do you ensure all forms of relevant knowledge including, scientific, indigenous and local knowledge, innovations and practices are included?

Explanation

Information from all sources is critical for arriving at effective ecosystem management strategies. Much better knowledge of ecosystem functions and the impact of human use is needed to inform decisions. All relevant information from any area under consideration should be shared with all stakeholders and actors, taking into account, inter alia, any decision to be taken under Article 8(j) of the Convention on Biological Diversity. Assumptions behind proposed management decisions should be made explicit and checked against available knowledge and views of stakeholders.

Guidelines for answering this question

Relevant information should be shared with other stakeholders and actors and technical and scientific information be made available in an accessible way (indigenous and local knowledge should be treated with full respect of Article 8(j) and further decisions of the CBD).

Assumptions behind proposed management decisions should be made explicit based on the best available expertise, scenarios of future change and the knowledge and views of stakeholders.

Appropriate mechanisms should be developed to document and made more widely available the information from all relevant disciplines (including natural and social sciences) and from relevant knowledge systems, particularly those based on local and traditional practices. This guidance should be implemented consistent with any decision to be taken under Article 8(j) of the CBD.

The implications for ecosystem management of different “world views” based on different knowledge systems should be evaluated.

Tools

Public participation and knowledge sharing
Education and awareness campaigns
Adaptive management methods

Further Explanation

Ecosystems can be viewed at various scales and from different perspectives, each yielding unique information and insights. Good management should therefore consider all relevant information. In this regard it should be noted that:

- The ecosystem approach is designed to accommodate a range of values and associated goals, and the information and perspectives of the communities that hold those values are therefore important in designing and implementing management.
- There is no single level of organisation at which one can understand and optimize management of ecosystem functioning. Different information sources will address issues at different levels, providing complementary perspectives to support integrated management.
- Good management therefore depends on maximising the information inputs, carefully assessing their accuracy and relevance, and integrating the information into decision-making and management.
- Ongoing support for understanding and information (e.g. research, monitoring, indicators, assessments, etc) is required.

Task 12. What measures can be taken to facilitate the involvement of all stakeholders including all sectors of society and scientific disciplines?

Explanation

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

Guidelines for answering this question

The integrated management of land, water and living resources requires increased communication and cooperation, (i) between sectors, (ii) at various levels of government (national, provincial, local), and (iii) among governments, civil society and private sector stakeholders. Increased communication among international and regional organisations is also needed.

The incorporation of the ecosystem approach principles as an integral part of planning in, among others, the agriculture, fisheries, forestry and other natural resources management sectors potentially affecting biodiversity and ecosystem functioning, should be encouraged, following the example, for instance, of the Code of Conduct for Responsible Fisheries, Sustainable Forest Management or others. Sectors other than the primary production sectors may also have major effects but are often less recognized in this respect. These include sectors such as the judicial sector, which affects governance, as well as those such as energy and transport, which are managing or affecting resources either directly or indirectly.

Procedures and mechanisms should be established to ensure effective participation of all relevant stakeholders and actors during the consultation processes, decision making on management goals and actions, and, where appropriate, in implementing the ecosystem approach.

The effective implementation of the ecosystem approach may require involving multidisciplinary professional and scientific expertise, including such disciplines as economic, social and natural sciences.

When assessing the costs and benefits of conserving, maintaining, using and restoring ecosystems, the interests of all relevant sectors should be taken into account for equitable sharing of the benefits according to national law.

Tools

Public participation methods

Modeling methods

Inter-disciplinary research and communication

Further explanation

The complexity of managing an ecosystem for sustained use and conservation requires integrating the activities and actions of many different stakeholders. In this regard it should be noted that:

- The activities of all sectors affect biological diversity, and can contribute to, or detract from, the achievement of the objectives of the CBD.
- The management of biodiversity, because of its complexity, and the significance of human impacts, requires a wide range of scientific and management skills, including those located in sectors that have not traditionally been involved in biodiversity conservation or management.
- For these reasons adopting the principles of the ecosystem approach provides a framework for fostering greater involvement of all relevant stakeholders and technical expertise in planning and carrying out coordinated activities, sharing management of resources, or simply exchanging information.

Cross-cutting issues

In addition to the individual tasks identified above there are a number of cross-cutting issues that need to be considered when applying the ecosystem approach.

Capacity-building and participation

To apply the ecosystem approach successfully it is crucial to investigate what resources and sponsorship are required to undertake the exercise. This can be in the form of capacity-building and fostering alliances.

Alliance can be in terms of community partnerships, stakeholder engagement, political and institutional willingness to participate and empower, and the commitment of international donors or sponsors. An important consideration is the length of time the alliance is required; that is, it may be required in the initiation phase, assessment phase, the phase associated with implementation of outcomes, or all three and beyond. Examples exist where an ecosystem approach has been compromised from a loss of allegiance from one or more of the community, other stakeholders, the political establishment and institutions, or sponsors and donors.

Capacity-building is also important for the success of any programme which is using the ecosystem approach to address the problems at hand. Adequate financial support and appropriate infrastructure support are important requirements for success. So too is access to suitable expertise and the sharing of knowledge and experience. Before embarking on a programme it is useful to build on lessons learnt from other projects which have used tools and methods consistent with the ecosystem approach principles. Technologies, including decision support tools and inventory systems, which have been developed elsewhere may be transferable or

can be adapted.

Information, research and development

The collection of resource, biophysical, social, and economic information is important to the successful completion of a project using ecosystem approach. Research and development might be required to target gaps in knowledge that hinder addressing the exercise at hand. Knowledge derived from research and information from other sources has to be integrated and packaged into information products (including decision-support systems) that allow and provide for interpretation, and which facilitate their use in applying an ecosystem approach. Information products are necessary for communicating with stakeholders, planners, managers and decision makers. Consideration should be given to enhancing the access of stakeholders to information because the more transparent the decision-making is, based on information at hand, the better the ownership of the resultant decisions between partners, stakeholders and sponsors. Priorities for research and development are likely to be clearer once the ecosystem approach begins to be applied and implementing actions are put in place.

Monitoring and review

Monitoring and review are crucial components of any programme using the ecosystem approach as a framework for implementation. They allow a responsive and adaptive management capability to be developed. Monitoring and review are also useful in reporting performance and assessing outcomes, and their links to the use of the approach. Indicators of performance should be defined, developed and implemented. Appropriate monitoring and auditing systems need to be implemented to support reporting on indicators of performance. Periodic reviews of these indicators need to be undertaken to assess performance and allow adaptive management where necessary. Strategies, practices and processes may need to be modified depending upon the findings from monitoring and auditing.

Governance

Good governance is essential for successful application of the ecosystem approach to a problem. Good governance includes sound environmental, resource and economic policies and administrative institutions that are responsive to the needs of the people. Robust and sound resource management systems and practices are required to support these policies and institutions. Decision-making should account for societal choices, be transparent and accountable and involve society. Accountability for making decisions has to be placed at the appropriate level that reflects that community of interest. For example strategic land-use planning and management might be taken by central government, operational decisions taken by local government or management agency, whereas decisions associated with the sharing of benefits could be taken by a community organisation.

Good governance at all levels is fundamental for achieving sustainable use and conservation of biodiversity. It is important to ensure intersectoral cooperation. There is a need to integrate the ecosystem approach into agriculture, fisheries, forestry and other production systems that have an effect on biodiversity. Management of natural resources, according to the ecosystem approach, calls for increased intersectoral communication and cooperation at a range of levels (government ministries, management agencies).

4. Creating a Management Plan

The information that follows provides a guide to creating the structures and processes necessary for implementing the ecosystem approach as part of a project to address a particular issue. It is aimed at those working to achieve sustainable management of ecosystems, although much of the information could also be applied to projects seeking the creation or development of legislation or policy. There is no correct way to create a plan, every situation is different and it is important to modify the plan to fit the circumstances under which the project will operate.

Identifying the issues

The processes through which issues are identified and the project plan developed can be difficult to separate. The use of the ecosystem approach should begin with an issue. Having identified the issue (or several) it can be assessed against the tasks set out above in Section 3.

However, once the potential tasks for action have been identified a draft management plan should be produced before actions have been finalised. This is necessary so that there is an opportunity for stakeholders to feed into the management processes at an early enough stage to ensure they are part of the management process. If the involvement of stakeholders is left too late they might feel they can not contribute to the management process or the issues that concern them might not have been addressed. As a consequence it will be more difficult to develop relationships based on trust between the different people and organisations involved.

Creating a Draft management plan

The objective of the draft management plan is to:

- Set out the tasks that need to be undertaken to meet the issue(s) and the objectives of the ecosystem approach.
- Determine who needs to be involved in the tasks and what mechanisms could be used to encourage participation.
- Set out a draft timetable for actions and target dates for completion (though it is important to keep these as flexible as possible especially during the initiation phase of the project).

Timing

Before setting up a project choosing the right time for its establishment is important. There might be opportunities or circumstances which can help or hinder the project's success. For example:

- Political stability – a return to a more stable political situation can provide an opportunity to develop a new project.
- New government policies and strategies can create conditions under which a project can thrive. Likewise the ratification of international conventions can provide an opportunity for a country to review environmental policies, legislation and practice.
- Re-organisation and re-structuring to government departments and institutions can provide opportunities.

The time taken to put in place actions that can restore or maintain ecosystems should not be underestimated. At the project initiation stage the likely time required for the various elements of project preparation, enactment and follow-up should be evaluated. Stakeholders should be given realistic timings so that they do not become disillusioned or frustrated by the time taken to put plans into action and for results to be achieved.

Key actors

One of the first tasks is to decide which organisation should lead the project's development and subsequent implementation. These roles do not have to be undertaken by the same organisation, for instance a government department might provide the initiative to set up the project but it would actually be run by a local or regional organisation in either the public or private sector, or an implementing body might be created specifically to address the issue.

Reliance should not be placed on one organisation to carry out the project as this can jeopardise the likely success. Successful projects often have one fully-committed organisation (either governmental or non-governmental) which works with other partner organisations. The lead organisation should be able to act as:

- An effective facilitator and co-ordinator working with all stakeholders.
- Provide clear reasons for and evidence of the decisions taken.
- Be willing to listen to the views of others and adapt to their needs if that is required.

Engaging with stakeholders

It is important to engage with the stakeholders as early as possible. Initial consultations are vital for ensuring that people feel they can contribute to the development of the management plan, especially if there is any likelihood that it might have an impact on their activities. Stakeholders can provide ideas and reactions to help develop the project. It should not be underestimated how much time is required to fully engage with all interests and care should be taken not to raise expectations of results or when actions will begin. Developing good relationships early on can strengthen commitment to seeing the project through. The development of trust between everyone can help overcome difficulties if they arise in the future.

There are many different ways to encourage stakeholders to participate. Workshops and focus groups can be one way to engage a number of stakeholders at the same time. In other circumstances one-on-one liaison might be the best approach initially before advisory/working groups can be established. Tools such as decision trees can be very useful for explaining the range of issues affecting an area and for capturing new issues. Later on decision trees can also be used to develop pragmatic steps for addressing problems. More information on engaging stakeholders can be found under the sourcebook section on tools and approaches or search for case studies / tools on the database under public participation.

Setting Objectives

All projects need well defined and readily identifiable objectives. These and any actions should be agreed through discussions with stakeholders so that an understanding of the issues and actions necessary to address them can be agreed and understood. The objectives should be closely related to the issues identified. The use of decision making tools can be useful in this respect. For example having

established a problem tree when identifying the issues to be addressed can then be used to create an objective tree. In this case each issue is paired with an objective so that if the issue is a decline in native invertebrates, the objective would be to halt the decline and adopt management necessary to increase native invertebrates.

The setting of objectives can also provide a useful starting point for creating monitoring actions.

Project design

The development of the project plan should consider

Adaptive management

The management plan should be flexible, with a clear aim and methodology for reaching decisions and undertaking actions, which in turn are realistic and clearly justified. Progress should be assessed against agreed targets which can be reviewed as necessary to allow for any change in circumstances. All outputs should be agreed and discussed with stakeholders to allow them the opportunity to contribute to this process.

Long-term viability

The ultimate aim for any project should be the continuation of the objectives beyond the project's lifespan. This includes providing implementing organisations with the resources to continue long-term management after the project has finished. The development of an exit strategy at the beginning of project so that at the end it is agreed who and how organisations can continue to meet the objectives. This can also strengthen commitment to the project as it is clear how it will continue into the future.

Financial stability is also key to long-term viability. Where possible self-financing strategies should be developed to ensure sufficient resources are available. These may come from, income generated from products or services from the ecosystem or where non-tradable services are generated (eg national park or watershed protection) it might be appropriate for government funding.

Defining the boundaries, scope and time scale

Although boundaries lead to limitations these can be necessary for managing ecosystems. Tasks seven and eight in Section three above identify what issues need to be taken into account when developing the boundaries.

Producing the project work plan

The first task of the core work team is to produce a work plan, which should be done in a participatory and collaborative manner, using logical framework techniques to facilitate problem analysis and planning.

A research plan might also be required; this will cover collecting social, ecological and economic data. Where ever possible links should be made with the academic and research institutions specialising in the area (either geographic or sectoral), and should use the capacity of local communities to provide baseline information.

The creation of the work plan is a unique opportunity to define a clear public image for the project and to communicate it as widely as possible. This is important because the ecosystem approach is still a new concept to many which might not be widely understood or appreciated. The best project image is one that clearly promotes it as a capacity-building and conflict solving exercise, with a group of

unbiased experts working in close association with the various interest groups.

Reducing risk to project outcomes

Risk analysis should be used to identify critical issues/risks to the project. For example:

- Is there sufficient scientific and other knowledge available to undertake identified field activities? If not, it might be necessary to undertake surveys etc before moving on to specific activities.
- Is the project expected to have significant environmental or social impacts? All projects should be assessed to ensure negative impacts are not detrimental.
- Has there been previous communication with local groups, organisations or individuals? If not, or where there have been difficulties before, a preliminary consultation phase might be needed to build confidence and good working relationships between the project and the local people.
- Legal barriers to project implementation should be considered. For example Wildlife and environmental legislation might not be compatible with sustainable use of natural resources.
- Land tenure and access to natural resources for local communities - if security of land and access to the benefits is not clear, local communities can not be expected to take responsibility for management.
- Legal boundaries of a protected area which are not clearly defined, making implementation of management measures difficult.
- Do organisations have the correct resources for implementing parts of the project plan identified for them? If not, training and capacity-building might be necessary.
- Do institutional barriers affect project implementation, for instance does an inappropriate agency have responsibility for management? It might be necessary to seek new legislation or work with the agency to find appropriate mechanisms.
- When attempting to restore degraded ecosystems it might be necessary to carry out a pilot project to assess restoration techniques before working on a larger and hence more risky scale.

Monitoring and evaluation

Monitoring can be used to assess progress and determine how future management can be developed to meet the project's goals. The monitoring of activities, aims and objectives should not be fixed but remain adaptable to changing conditions as knowledge, understanding and issues are raised and resolved. Sufficient time should be allowed for effective monitoring and any changes should be supported by evidence as to why the change was made. This provides information to those assessing the project's success and stops targets being revised down for convenience of action. Monitoring should cover both the short and the long-term to allow initial results and the future sustainability of the ecosystem.

Wherever possible local people and organisation should be involved in monitoring. Local groups will be more likely to collect information which they can analyse and use themselves in managing the ecosystem. This information can be complemented by other monitoring activities.

Indicators can be used to monitor success, for example by showing practical and visible project outputs, such as species distribution maps, new government regulations protecting wildlife, establishment of new partnership organisation. Changes to the abundance of species, increased productivity or access to a resource can also be used as indicators.

It can be difficult to assess changes to attitude, awareness and behaviour, without considerable monitoring effort. This type of monitoring can be very effective for showing how understanding of resource use has changed or whether there has been effective devolution of decision making in resource use to an identified group.

Ecosystem health can also provide a valuable mechanism for assessing a project's achievements. For example by assessing changes to biological diversity, food chain characteristics, ecosystem productivity or ecosystem functions.

Project Implementation

Key concerns in implementing natural resource management projects include Length of time allocated to the project to achieve an impact on the health and integrity of ecosystems, is crucial. Improved ecosystem management and natural habitat restoration may require 10-15 years of work before results become apparent.

Staff competence and commitment is vital to project success

The creation of a network of partner agencies and interest groups, which will progressively take on the implementation of the project activities is vital. This will help empower others and stop the project becoming an institution with its own agenda.

Political, institutional and community support must be secured to fulfil the project goals and objectives.

Project implementation generally follows a series of stages, some of which overlap and can include several steps. For example

Stage 1

- a. build project team
- b. produce work plan and develop links with the local community and other stakeholders
- c. establish advisory committees

Stage 2

- a. determine project activities
- b. desk-based actions
- c. capacity building
- d. review project (adapting monitoring and research as required)

Stage 3

- a. putting agreed plan into action

Stage 4

- a. continuation and forward planning
- b. strategic plan for future initiatives

5. Assessing a project against the ecosystem approach

Often an activity undertaken to meet a particular problem will address more than one ecosystem approach principle or task outlined above. For example, involving stakeholders in decision making processes could meet tasks 1, 2, 10 and 12. By assessing what activities meet which tasks it is possible to decide if the project is applying the ecosystem approach. Filling in the table below allows the project to be assessed against the ecosystem approach as a framework. It might be necessary to create a series of tables covering the different sub-issues being addressed by the project. The table can also be used to determine whether particular principles are not being met. If this is the case referring back to the tasks and the reasons why they are important to the ecosystem approach might highlight to the assessor whether activities are being missed. Conversely it is also legitimate to view some principles as more important than others. Where this is the case it is can be useful to provide reasons why a principle has not been met for future analysis of the project. By including information on the tools and methods being used to meet the task it is also possible to determine if there are links between particular task and a sub-issue of the project. For example if public participation is being used to meet several sub-issues and tasks it might be possible to combine efforts to reduce costs and the time taken to consult with stakeholders.

Table 1. Assessing a Project against the 12 ecosystem approach tasks

Task	Action / project activity	Tools /method being used
Task 1 Societal Choice		
Task 2 decentralised management		
Task 3 effects on adjacent ecosystems		
Task 4 Economic context		
Task 5 Maintain ecosystem services		
Task 6 Limits to ecosystem function		
Task 7 Appropriate spatial/temporal scale		
Task 8 Long-term management		
Task 9 Change is inevitable		
Task 10 integration of conservation and use		
Task 11 Consider all forms of knowledge		
Task 12 Involve science and society		

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