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Biodiversity & Livelihoods

Where the Ecosystem Approach can take us

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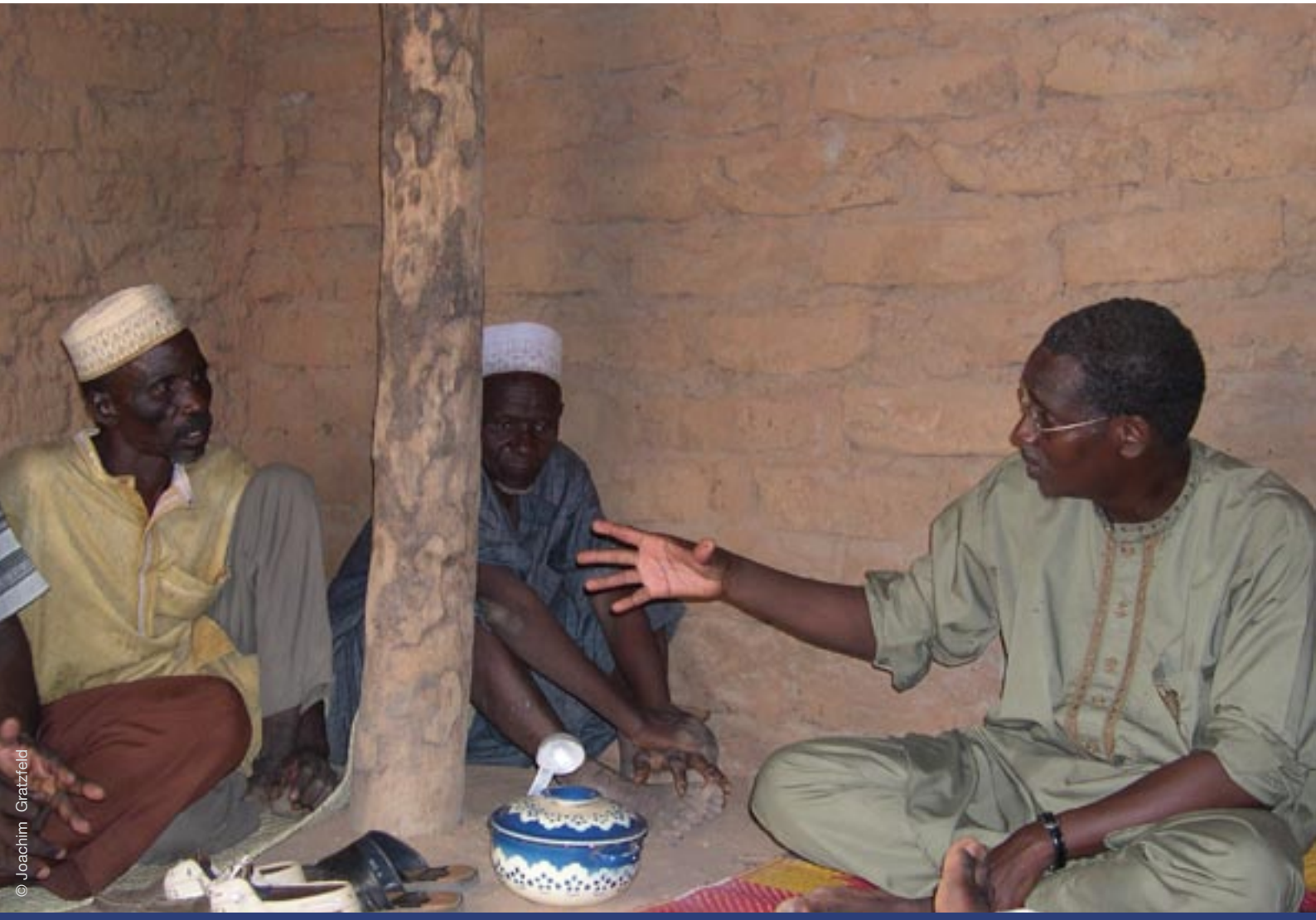

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Introduction

Over the last three years, IUCN's Commission on Ecosystem Management has conducted a series of case studies, funded by the Government of the Netherlands, which have followed the application of the Ecosystem Approach in the context of projects or other land management initiatives. The studies took place in Panama, dryland West Africa, the Congo basin, the Mekong Delta and Indonesian Papua (former Irian Jaya). The evolution documented in each of the case studies is summarized in the Table 1.

The case study writers used IUCN's Five Steps[1] as a framework for assessing to what extent the twelve Ecosystem Approach principles endorsed by the Convention on Biological Diversity had been put into practice (see Annex).

Considerable progress has been made in understanding the strengths and weaknesses of the Ecosystem Approach. Here we present some of the most interesting findings and challenges for the future thrown up by the case studies, shortly in advance of the publication of an IUCN book on the subject, *'The Ecosystem Approach: learning from experience'*.


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Key findings

What are the challenges to which the Ecosystem Approach might provide solutions?

For the Ecosystem Approach to have a value, it must have a problem-solving capacity. A new way of looking at issues might come about as a result of a crisis, in which the old way of doing things is no longer seen to be adequate, and new knowledge, new institutions or a new appreciation of the ecosystem itself is called for. The starting points for the application of the Ecosystem Approach began in just such a way in several of the case studies analysed here.

In the case of the Mekong delta protected area Tram Chim, the protection goal was unclear and so management decisions were not dealing with key problems. What should have been a wetland site, protected for the endangered migrant birds that visited it, and ensuring that the grasses on which they fed were available, was being managed for forest values and in order to prevent local people from fishing at the site. The Ecosystem Approach was used to unpick the problems, and to provide not only some possible site-based solutions, but also to suggest national level policy blockages that needed to be addressed to make it possible to manage the site for its intended purpose.

At the CIB logging concession in the Congo, the challenge to be addressed was the company's desire for certification. In the process of adapting management to gain its FSC certificate, the company had to broaden its understanding of biodiversity, of local people's use of forest and of its own impact and address these issues one by one.

In Bocas del Toro in Panama, the Ecosystem Approach was used to try to address an emergency – the collapse of local fish stocks and local fishing livelihoods, following a period of government-encouraged commercial fishing for export to Panama city and beyond. Attempts were made to gather the information needed for new decision-making, but the process has been temporarily overwhelmed by institutional problems, and by a huge (unrelated) increase in tourism in the area.

In Indonesian Papua, the trigger for new ways of working came as the result of land-rights conflicts between indigenous peoples in the Province and the national Ministry of Forests' attempts to continue to allocate land for logging concessions over their heads. The Provincial head of Forests is using an Ecosystem Approach to map local customary lands, align them with official Forest Capability maps and to develop complementary systems of community use, conservation and commercial use for which compensation is paid to local clans.

In the Niger-Nigeria borderlands analysed, ecosystems are best understood in terms of a local intensively used and mainly farmed ecosystem overlaid by much broader ecosystems

[1]Gill Shepherd, 2003. The Ecosystem Approach : Five Steps to Implementation. IUCN Commission on Ecosystem Management, Gland.

Issue → / Location ↓	Type of eco-system	Key challenges addressed	Progress made	Further work needed
Niger/Nigeria	Extensive dryland farming + livestock herding areas	Population growth thro' in-migration; wide climate fluctuations; need to integrate agriculture and livestock more fully into less open landscape.	Rapid and creative adaptive management underway over time and space, in response to pressures.	Ensure that practical achievements inform policy, and supporting them with better credit and extension services.
Congo Basin	Lowland rainforest and swamp forest	Limited ecosystem knowledge and local stakeholder involvement. Rapid growth of con-cession area. Illegal hunting and trapping. Market pressures; institutional failures.	Development of symb-iotic relationship between logging concession and protected area. Positive impetus from certification Improved forest knowl-edge. Mapping of local land and resource rights.	Extend experience to other CIB Forest Man-agement Units. Improve stakeholder ability to represent themselves. Ensure that Development Fund is well-directed to real needs.
Mekong Delta	Delta wet-land, grass –land, and flood-tolerant forest	Unclear and un-resolved Protected Area goals; stake-holder ambiguities; rigid management hierarchies.	A thorough analysis of problems, possible solutions and next steps which can be implem-ented by project.	Clarify management goals with national level. Limit local access rights by allowing use of only poor people's fishing gear.
Indonesian Papua	Highland and lowland tropical forest and mangroves.	Stakeholder poverty and conflict with concessions and protected areas. Unclear rights; lack of convening mechanisms.	Legal clarification of nat-ional and provincial rights to manage forest. Mapp-ing customary forest rights of indigenous peoples. Applying Eco-system Approach to int-egration of these into government planning.	Extend activities to further areas in Papua. Disseminate approach to other parts of Indonesia.
Panama	Marine and coastal	Collapsing fish stocks as a result of previous pressure to commerc-ialize fishing. Rapidly growing government-supported tourism destroying mangroves, reefs and other natural resources.	Some data gathered, but poor information sharing; weak oversight. Institut-ional failures, failure to recognise commercial issues early enough. Problems analysed, solutions not yet applied.	More planning with local fishermen and local tourism operators. Better demarcation and agree-ment of areas for prot-ection and use. Creation of more environmentally - oriented tourism and retirement condominiums

used by some for products not available locally, or seasonally by others for grazing animals or wage-labouring. Here, the Ecosystem Approach provided a way of conceptualising the overlapping uses made of these ecosystems by different stakeholders, which proved more helpful than sectoral approaches, and which provided an actor-focussed insight into household and group decision-making about ecosystems.

Ecosystem size and scope

Several of the case studies show how, as issues are better understood and as institutional mechanisms allow, mosaics of different kinds of complementary land-use can be harmonized into larger and more coherently managed areas over time.

In the Congo, the CIB company began to work closely on the management of one of its Forest Management Units (FMU) with a conservation organisation managing an adjacent Protected Area (PA). Joint planning took place for the monitoring of legal hunting and the limitation of illegal hunting in both areas, minor adjustments were made to the boundaries of FMU and PA and broader assessments were made of human impact and how to divert some of it to a nearby town. While not all problems have been solved yet, a roadmap for further action is in place.

In Indonesian Papua, the whole Province is treated as a single area, where planning for conservation, production, and local community livelihoods and productive activities is taking place for the province as a whole. In production areas, plans and the structures to implement them are being approached on an FMU by FMU basis. In conservation areas, the planning of boundaries, enclaves and possible excisions by local forestry officials and local people, is to be used to dovetail local land-rights and livelihoods with the protection of the Lorentz World Heritage site. The Ecosystem Approach structures thinking in all these areas.

The Bocas del Toro archipelago in Panama is an example of conflicting ecosystem management boundaries, weakly managed by either the State or by conservation organisations, within which local fishing groups' attempts to conserve fish stocks and create set-aside areas were insufficiently supported by local NGOs assigned to the task, and finally fell apart in the face of competition from tourism.

Management and the institutions to deliver it

The case studies have all shed particular light on management and institutional challenges and solutions.
The ideal management arrangement, well explored in the case study on the Maradi-Kano region of Niger-Nigeria, has a range of functioning institutions which have evolved over time, at village/district and higher levels. Ideally these have long been nested one inside the other and have open channels of communication between levels, in both directions. With such institutions in place, new tasks can fairly readily be taken on as population densities go up, or as climate fluctuations force changes in the ecosystem and the need for new ways to try to conserve resources.

But the more common problem is a lack of the right range of institutions, or impediments to the flow of information between levels. In the case of Tram Chim park in the Mekong delta, for instance, there are no appropriate stakeholder institutions through which the thousands of villagers who live around the park could interact with park authorities. Even more problematically, Park Managers have very little independent authority and fear the censure of Regional officials. These in turn act only on the basis of decrees from the national level. There is no incentive to innovate, or even to collect much new data in such contexts. While an independent ecosystem analysis at Tram Chim made these issues very clear, there is no endogenous way of using the Ecosystem Approach where there is no ability to undertake adaptive management on the basis of new enquiry and new results.

Incremental institutional and management change can take place fruitfully, where the authority to diagnose problems through the use of the Ecosystem Approach is there – and where, in other words, a higher authority is prepared to consider innovation.

In the CIB concession in the Congo, at the moment, CIB undertakes a very wide range of management activities from those concerned directly with the timber business to those concerned with the welfare of employees and local residents. It negotiates with the government and with conservation NGOs, and manages researchers. Institutional inadequacies cluster at lower levels, where local people, though consulted, have no


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systematic way of recording their opinions or their knowledge and so prior informed consent cannot truly be said to have been given. A Village Committee exists, though it is not truly representative of all parties at the moment. A development fund currently planned by the company is thus unlikely to be spent in the best way. However, the company has now hired a social scientist to make improvements in all these areas.

In Indonesian Papua institutional innovation is also required. 'Traditional' clan organisations need to learn how to negotiate less with one another and more with Provincial Government. Institutions for joint management and planning by clan organisations and commercial companies will shortly be required. Similarly provincial and district level government levels need to take on new roles as strategists, umpires, and extension agents. Since the Provincial Forest Office is eager to see all these institutions evolve and develop in this way, it will be possible for outside supporters to help them to do so.

In Bocas del Toro, Panama, fishermen's cooperatives needed a range of supporting NGOs to liaise between them and local government, and these NGOs collapsed before they were strong enough to operate independently.

All these examples show that management goals have to be clear-cut, and agreed by stakeholders, if the right institutions are to develop to continue successfully with management.

Adaptive management

All the case studies have plenty to report on adaptive management over time. The Congo case is able to report how CIB has moved over a decade from narrow sustained yield forestry to a style of management strongly infused by ecosystem management thinking and recently rewarded with an FSC certificate.

But the most interesting case from this point of view is the Niger-Nigeria border one, not least because adaptation has all been undertaken by local people themselves. The researchers who worked on this study were able to draw on twenty years of their own previous research, as well as on a record of the situation across space today along a five-village continuum from a more arid northerly village to a somewhat less arid village 200 km to the south.

Growing populations (the result partly of natural increase but also of in-migration from both north and south) have dictated considerable intensification of land-use. This includes the conversion of much woodland to fields and fallows, the fertilization of fields close to villages by manure and fertilizer rather than by fallowing, and the more intensive feeding of animals in stalls during the cropping season, and on private fields afterwards. Transhumant herders fit less and less successfully into this landscape. Within rainfall limits soil fertility, a key determinant of ecosystem health, can be maintained under good management and farmers struggle to the limits of their capacity to achieve this. Resource conservation and resource use are intertwined, and linked to ownership and rights.

As the writers point out, stakeholders are conscious of the fragility of their ecosystems and the necessity to conserve them. They are aware of change, and of interrelations between different ecosystems. It is seen to be necessary to work at the integration of the interests of different stakeholders, for these ecosystems to survive and thrive.

Knowledge management

All the cases make it directly or indirectly clear that knowledge management is a vital part of management.

Sometimes the contrast between different kinds of knowledge is the trigger to new approaches to problem solving. In the case of Indonesian Papua, for instance, it was the disjunction between nationally prepared (and satellite-based) land capability maps for Papua, and the valuation of forest revealed by participatory mapping and forest-focussed Participatory Rural Appraisals (PRAs) conducted among Papua's indigenous peoples, that convinced the Provincial head of forests that the two had to be fitted together. The results could be made to deliver greater justice and greater ecosystem benefit at the same time. Neither side had had any idea of the forest classifications and related management activities employed daily by the other, until meetings were held at which the knowledge was exchanged.

In the Congo, CIB's problem-oriented approach to data-gathering on the dynamics of the forest and the distribution of animals, contrasts very positively (from the management point of view) with the World Conservation Society's species-based data-gathering through its support to PhD students. Neither has as yet properly shared their information with local people, and only CIB has gathered mapping data from local people. 'Prior informed consent' demands that this area of knowledge management be considerably improved.

In both the Mekong delta and Panama, knowledge management has been weak. In the Mekong, data collected locally may not inform local-decision-making, but must be referred upwards for decisions about even something as simple as when to open or close sluice gates. Here hierarchy has got in the way of the knowledge which ought to empower action. In Panama, an NGO collecting simple data on the availability of various fish species neither taught local fishermen its counting methods, nor shared the data with them at the end of the exercise, nor explained why a balance between types of fish was essential for the health of the reef. The NGO ceased to exist and the data were lost without ever being used.

The Ecosystem Approach's stress on the democratisation of data-gathering and sharing deserves even greater underlining, and should apply to all phases of data-collection, from the creation of baselines, through assessment and monitoring, to evaluation.

It should also choose methods which can be understood and accessed by all parties, and some imaginative effort may be required to reach inclusivity. In the case of the CIB concession in the Congo, for instance, the local pygmy leaders were taught how to use GPS in order the record the boundaries of grave-sites, and religious sites, and the locations of key non-timber forest products harvesting areas so that none would be disturbed or logged. The GPS were specially equipped with symbols for all these purposes so that illiterate people were


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able to use the machines in the field. They then came back into CIB's mapping office to see their symbols being transferred to CIB's master concession maps. In Papua, local people spent weeks helping to map customary territories, devising symbols for different kinds of forest and forest resource, drawing sketch maps and gradually aligning these with satellite imagery.

Markets

The case studies have illustrated how great the influence of markets on ecosystem management is. The influence may be negative when the traded product is illegally snared bush meat, but it is often highly positive, giving incentives for active management where there would otherwise be few or none.

The Niger-Nigeria case study shows how, just as ecosystems are embedded one inside the other in the way they are conceptualized by their users, and managed by hierarchically-linked institutions, so too market chains mean that villagers have interests far from the village. Local ecosystems and the uses made of them by local people are influenced by the existence of markets at village level, at nearby weekly markets, at cattle-markets up to eighty kilometers away and at markets over the border in the next country. Often it is only long-distance high-value sales that make it possible to buy the fertiliser to maintain local farms.

In Papua, (under its current visionary Provincial Forest Department Head) markets for timber, and the demands of sustainable and profitable timber production are what is driving the move towards better rights for local people and an end to conflict between large-scale producers and local people.

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These market-driven benefits will extend to conservation areas where ecosystem-level planning might otherwise have been uneconomic.

The CIB Congo case shows rich local ecosystems indirectly engendering markets which trade across an enormous catchment area. Not only is timber trucked to Cameroonian ports, and Cameroonian oil and foodstuffs imported to the concession from equally distant points, but people have been attracted to the concession from all over Central and indeed Western Africa for trade as well as employment reasons. Household goods imported from Cameroon are even sold on to the southern end of the Congo. CIB's company town, Pokola, has become a regional hub. What drives this market is the purchasing power of CIB's salaried employees, which has enormous implications for the effort which must be expended to protect local ecosystems from illegal hunting by potentially large numbers of people, for potentially insatiable markets.

Such cases suggest that it is very important to understand that the physical ecosystem sits within an economic 'ecosystem'. Similarly, the market is pivotal in the relations between social system and local ecosystem on the one hand, and also between local and more distant ecosystems on the other.

Where can the Ecosystem Approach take us?

As a framework for analysis

The Ecosystem Approach is useful for planning, for monitoring and for ex-post analysis to evaluate and draw lessons from what went right and wrong. The Ecosystem Approach provides a way of marking progress against a baseline and noting incremental change towards final goals. It does not offer a pass/fail judgement. It highlights management dilemmas and forms, overall, an excellent assessment framework.

As a framework for implementation

However, for the Ecosystem Approach to go beyond analysis and investigation to application, certain preconditions may have to be in place. It can only be fully applied where people are ready to share power and knowledge. There has to be willingness to invest in the gathering of knowledge, and in the realigning of management goals and practicalities in the face of that knowledge.

So, to be effective, the Ecosystem Approach must have the freedom to be a multilevel approach - national and sub national policy and legal frameworks may be just as important as what is going on within the ecosystem itself. It is often the case that until ambiguities are resolved at top government levels, it is difficult to deal with the local stakeholder issues. In the

case of Protected Areas, it is important to understand that often the ecosystem manager is only an implementer, and that innovation must be agreed elsewhere.

The Ecosystem Approach, applied in a landscape mosaic of different kinds of tenure and different kinds of land-use can become an analytical and integrative mechanism if stakeholders are prepared to make it so. (In the case of Papua, it even has the potential to become a tool for justice and redress for people who have lost land to national parks, forcibly settled transmigrants, and to oil, gas and gold-mining companies).

However, several of these cases show that where goals are not clearly worked out with stakeholders at an early stage, where absent stakeholders hold all the power, or where there is an ambiguity about management goals, the Ecosystem Approach can only provide an analysis of problems, but cannot deliver solutions.

Integrating biodiversity and development

New thinking about integrated ecosystem management now needs to be translated into effective, accountable and democratic planning, negotiating processes, and decision making. In non-protected area landscapes people and their use of landscape and biodiversity are at the centre of ecosystem management. Conservation, productivity and sustainability outside protected areas all depend on decisions made by local managers, a majority of whom are poor and small-scale farmers or livestock producers. Such an agenda cannot be imposed from outside, and the challenge for any conservation or development agency lies in facilitation, empowerment and incentives. In other words, biodiversity conservation cannot be treated in a fragmented manner - we have to take account of its economic and governance dimensions.

What distinguishes the Ecosystem Approach is that sustainable management of ecosystems can be given equal weight with development objectives. This reflects the realities of poor people, who understand ecosystem degradation and environmental risk as threats to their livelihood strategies. The Ecosystem Approach is better adjusted to these realities and easier for local people to relate to, than an exclusively sectoral or technical approach to development.

Looking to the future

For poor rural people in many parts of the world, improving ecosystem management and enhancing livelihoods go hand in hand. The Ecosystem Approach provides a framework for addressing the two and in so doing can make an important contribution to the achievement of the Millennium Development Goals in rural areas.

Above all, it is our opinion that the Ecosystem Approach has much more analytic power for dealing with adaptation to change than it has so far been credited with. The impact of decentralisation, urbanisation, population growth, migration and climate change on ecosystems will no doubt increase in years to come. An ability to analyse these processes and their impact on ecosystems and livelihoods is vital.

The case studies presented here were conducted by researchers using the Ecosystem Approach as an *analytical* tool. But there is clearly also a need, which we are now in a much stronger position to address, for more detailed field guidance for implementation.

For this we plan, *'The Ecosystem Approach: a field manual'*. Based on the findings of our case studies, key questions that such a manual should address include:

- the kinds of data-gathering and knowledge sharing needed to enable active involvement of all relevant stakeholders;
- the conditions under which local communities, government, the private sector, or other stakeholders, are willing to invest in ecosystem management, and how to bring them about;
- how to recognize market forces as threats to and potential opportunities for ecosystem management;
- how to create space for experiments at local level that have the potential to influence national policy;
- how to foster the emergence and strengthening of clusters of institutions for adaptive management at landscape level;
- how to manage adaptation to change.

The manual will be tested and adapted with practitioners in the projects of IUCN and others, so that it will be a product of wide relevance.

Annex:
The Five Steps and the 12 Principles of the CBD Ecosystem Approach

IUCN CEM took the twelve Ecosystem Approach Principles and grouped them as shown here, so that they could be applied in a sequenced series of steps.

Step A: Area and Key Stakeholders

Principle 1: The objectives of management of land, water and living resources are a matter of societal choice.

Principle 7: The Ecosystem Approach should be undertaken at the appropriate spatial scale.

Principle 11: The Ecosystem Approach should consider all forms of relevant information.

Principle 12: The Ecosystem Approach should involve all relevant sectors of society and scientific disciplines.

Step B: Ecosystem Structure, Function and Management

Principle 5: Conservation of ecosystem structure and function, to maintain ecosystem services, should be a priority target.

Principle 6: Ecosystems must be managed within the limits of their functioning.

Principle 10: The Ecosystem Approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.

Principle 2: Management should be decentralized to the lowest appropriate level.

Step C: Economic Issues (Principle 4)

Principle 4: There is usually a need to understand and manage the ecosystem in an economic context and to:

i - reduce market distortions that adversely affect biological diversity;

ii - align incentives to promote biodiversity conservation and sustainable use;

iii - internalize costs and benefits in the given ecosystem

Step D: Adaptive Management over Space: Impact on adjacent Ecosystems (Principle 3)

Principle 3: Ecosystem managers should consider the effects of their activities on adjacent and other ecosystems.

Step E: Adaptive Management over Time

Principle 7: The Ecosystem Approach should be undertaken at the appropriate temporal scale.

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

Principle 9: Management must recognize that change is inevitable

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