

The eco what approach??

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Valuing goods and services or integrated and equitable management – which of these will serve nature, people and places best? Confusion over the current ecosystem terms and a lack of caution over playing the economic game could lead us down a path we don't much like.

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Understanding of the Ecosystem Approach and what it means in practice seems to be getting lost – or perhaps never realised. Yet, as far back as 1995 it was adopted by the Convention on Biodiversity (CBD) as the main framework for action to deliver sustainability¹.

This may seem a curious statement given the recent IEEM Conference and 'In Practice' - but there lies the problem. There is a bewildering variety of new 'eco something' terms that we are confusing each other with: ecosystem/s approach, ecosystem-based approach, ecosystem function approach, goods and services approach, and ecosystem thinking. They are often taken to mean the same thing - but dig a little deeper and there are significant differences.

This article looks at the CBD 'Ecosystem Approach' and the 'ecosystem services approach'. Each has different values, paradigms and methods and results in different outcomes. Currently, the ecosystem services approach (often mislabelled ecosystems approach) is dominating the policy, funding and research agenda and looks likely to have a significant influence on policies, at least in the short term. However my view is that it is diverting far too much attention and funds away from effective management of the natural environment and brings with it a number of significant risks that are not well understood.

A bit of history and some definitions

The need for a more holistic approach to the natural world has become increasingly evident:

- The focus on sites, habitats and species has failed to deliver the strived for 2010 target of halting the loss of biodiversity.
- The word 'sustainable' is used to mean 'it's greener than it used to be' –which doesn't mean we know and keep within functional limits and avoid ecosystem collapse, unpredictable consequences, and high socio-economic and environmental costs.
- Reductionist approaches are used to manage complex systems with specialists (including ecologists who should at least know better) fixating on parts of the system.
- People are viewed as external to, and separate from, the natural world, leading to grave mistakes in underestimating complexity, impacts, interdependencies and feedback mechanisms.

In the mid 90's, in recognition of all this, the Convention on Biodiversity developed the Ecosystem Approach and defined it as '*a strategy for the **integrated** management of land, water and living resources that promotes **conservation** and **sustainable use** in an **equitable way***'¹.

In 1998 the CBD Ecosystem Approach was developed further and resulted in 12 guiding principles. To take these principles from the conceptual realm, five points of operational guidance were also developed. More recently, the CBD has produced practical implementation guidance¹.

The 12 Ecosystem Approach principles are:

1. The objectives of management of land, water and living resources are a matter of societal choice.
2. Management should be decentralised to the lowest appropriate level.
3. Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.
4. Need to understand and manage the ecosystem in an economic context (*ie avoid perverse incentives*).
5. Conservation of ecosystem structure and function to provide ecosystem services should be a priority.

6. Ecosystem must be managed within the limits of their functioning.
7. The approach should be taken at the appropriate spatial and temporal scales.
8. Process and objectives for ecosystem management should be set for the long term.
9. Management must recognise that change is inevitable.
10. Seek the appropriate balance between integration, conservation and use of biodiversity.
11. Decision-making should consider all forms of relevant information (scientific, indigenous and local).
12. Involve all relevant sectors of society and scientific disciplines.

The 5 points of operational guidance are:

1. Focus on the relationship and processes within the ecosystem.
2. Enhance benefit sharing.
3. Use adaptive management practices.
4. Carry out management actions at the scale appropriate to the issue, with decentralisation to the lowest level appropriate.
5. Ensure intersectoral co-operation.

The CBD Ecosystem Approach is an exciting shift in thinking. It roots the concept of sustainability in functioning ecosystems with stakeholder involvement leading to integrated management across sectoral interests, and a more equitable sharing of benefits. It sees humans as an intrinsic part of the system - not separate to and independent from it.

The 12 principles and 5 points of operating guidance are intended to provide a coherent package but the problem (at least in England) is that too many projects focus on one or other of the principles to the exclusion of the others. In particular, Principle 5 (*Conservation of ecosystem structure and function to provide ecosystem services should be a priority*) has been decoupled from the other 12 principles - although initiatives that do this are often still described as taking an ecosystem approach. (An example of this was the 2009 draft policy paper from Natural England⁴).

One of the drivers for this is because Principle 5 resonates with The Millennium Ecosystem Assessment⁵ which is about “*identifying, valuing and enhancing the goods and services that the ecosystem provides for us by conserving ecosystem structure and function in a way that ensures these services can be provided over the long term*”.

Benefits and risks of the ‘goods and services’ approach at a strategic level

Identifying and quantifying ‘goods and services’, promises to increase the weighting of biodiversity in decision-making. Conservationists have seen what the Stern Report⁶ did for climate change initiatives and work is now well under way on the global project ‘The Economics of Ecosystems and Biodiversity’ (TEEB) Report⁷.

The first phase concluded in May 2008 and reported that forest decline alone is estimated to be costing 7% of global GDP year on year. The studies leader, Pavan Sukhdev, is quoted as saying: “*So whereas Wall Street by various calculations has to date lost, within the financial sector, \$1-\$1.5 trillion, the reality is that at today's rate we are losing natural capital at least between \$2-\$5 trillion every year.*” The BBC headline declared ‘*Nature loss ‘dwarfs bank crisis’*’⁸... and it does.

TEEB⁹ is due to publish all its’ reports later this summer ready for the CBD conference in Japan in October - so by the time this article is published, more headline findings will be known. Advance rumours suggest TEEB will make the Stern Report maths look insignificant compared to the ‘*staggering costs of taking nature for granted*’. The TEEB for Business Report launched in London in July 2010, announced more astounding figures and there are many more to come.

Compelling arguments affecting politicians and public spending have long been the ‘Holy Grail’ for conservationists - more now than ever before and many hope valuing goods and services will do the trick. To this end, Defra is supporting a National Ecosystem Assessment¹⁰. But there are risks with championing nature this way. A recent editorial in Conservation Biology¹¹ lists seven concerns:

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1. Economic arguments will overwrite and outweigh any non-economic arguments for conservation.
2. Ecosystem services are assumed to be benign but processes like fire and flood are part of ecosystem function and yet present a major disservice to humans so will be at risk of being regulated out.
3. Ecosystem services can be provided by exotic species - that may do even better than natives.
4. There will be motivation to maximise a single service with the potential for naturally occurring systems to be altered with novel, artificial alternatives including through bioengineering of species eg to capture more carbon.
5. Markets will be created that reflect the desirability of a particular service for human consumption - not naturally occurring diversity.
6. There will be human winners and losers. Some people, organisations or countries will be able to afford to pay, operate and influence the new ecosystem service markets and others won't. This has welfare and equity implications.
7. Systems change and ecosystems break apart and reassemble in new ways. Will the beneficiaries of services resist natural change with increasing ecosystem brittleness?

Management of the natural environment

Leaving policy and markets aside what about direct management of the natural environment? Here too conservationists are embracing the valuation of goods and services with, in my view, a distinct lack of caution or questioning.

However, it diverts attention (and scarce public funds) from integrated management informed and negotiated via stakeholder participation (as envisaged by the CBD Ecosystem Approach) towards efforts to understand and quantify (usually in monetised terms) the services the natural environment provides. Resulting management effort will then focus on ensuring that the provision of these services is sustained for humans over the long term. This is both anthropocentric and econocentric.

Having reviewed some projects that sought to trial these approaches (including my own), the starting point (the CBD Ecosystem Approach framework, or a focus on ecosystem services) seems to result in fundamental differences in values, assumptions, participation processes, the role of stakeholders, technical models and scientists, and how and who uses what information to make decisions. I have illustrated the type of differences I perceived in Figure 2.

Figure 2: Comparison of differences between taking a CBD Ecosystem Approach and a 'goods and services approach'.

	CBD Ecosystem Approach Projects	Projects focusing on Ecosystem Services
Approach	Fosters Integrationist/holistic and systems thinking	Reductionist (considers parts of the system to place values on them)
Perspective on people	People are part of the system not separate to it	Anthropocentric – nature is at our service –ecosystems support us and we use the goods and services but we are not part of the system
Role of stakeholders	Involved to negotiate management and use. All forms of relevant knowledge used	Engaged primarily to generate valuations
Data	Data is used to serve the needs of stakeholders as they deliberate and make decisions	Valuation data, often generated by stakeholders, serves the needs of sophisticated models and specialist analysis.

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Who decides outcome	Outcomes are negotiated via stakeholder participation and collaborative processes that seek to 'Involve all relevant sectors of society'	Results of participation are processed and interpreted by specialists and provided as advice for the usual decision makers in public bodies.
Type of decision	Integrated management and multiple benefits - looking for 'both /and' solutions	Weightings and trade offs. Tendency to 'either/or' outcomes
Key challenge:	Finding ways to run good practice integrated and equitable decision-making processes informed by sound science and stakeholder involvement.	Finding ways to quantify services in a comprehensive and meaningful way to inform our decision-making.

I wonder if the emphasis on the services approach is because it feels more familiar. It uses numbers, data and models, all familiar territory to science-trained environmentalists. It also favours and enhances expert knowledge and the status quo in decision-making, which pleases the regulators.

To be clear, I am all for greater recognition and understanding of what the natural world provides for us. It results in greater care, respect and even humility. But this is not the same as having to quantify benefits through 'black box' valuation methods for them to be taken into consideration. After all, the CBD Ecosystem Approach was developed for all countries to use and few have the modelling sophistication or raw data that we can muster.

I understand why conservationists want big numbers that influence decision makers, make compelling headlines and grab column inches eg 'wetland worth 6 million', but this overlooks serious pitfalls when applied to real places.

Consider the example of a large wetland comprising reed bed, carr, and open water. A value could be quantified based on the 'service' the wetland is doing in improving water quality. By measuring the water quality in and the water quality out, you can work out what the wetland is stripping and then work out how much that improvement would cost in building and running a conventional water treatment plant. At face value, this seems a sound argument for valuing the wetland and preventing it from being drained. But there are a number of problems and risks. What happens if upstream management such as catchment friendly farming, or improvements in wastewater treatment, lead to the water quality that is coming into the wetland improving? If the wetland is doing less work for us, it is providing less of a 'service' and so becomes worth less. (This could even create a perverse incentive to not want to improve upstream water quality for fear of reducing the value of the wetland and the work it does!). In addition, this service is based on the wetland itself accumulating nutrients and consequently changing in ecological character. Other changes such as savings in the costs of new treatment technologies, or the cost of capital, or labour, and economic swings could all effect the equation. And what about the need for systems thinking: water containing high levels of nitrates and phosphates make for weaker reed stems, that can't then be marketed for thatch, so it won't be cut, will all scrub over, and goodbye bittern!

An idea that is bubbling now is that every unit of land in England should be assessed to identify how it could be managed to maximise the goods and services it provides. This is essentially farming for 'services' but again could lead to all sorts of unwelcome scenarios. For example, pockets of intrinsically species poor lowland acid grassland are valued by conservationists but what 'services' do they provide? Not a lot that could be measured economically - especially not compared to planting it with trees and capturing more carbon, or perhaps building houses on it - better to build on land that delivers low levels of 'goods and services' than land that delivers high levels.

Even if goods and service valuations are desirable for management, trying to work them out provides some significant challenges. At a conference we convened in 2008¹², one of the

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presentations was given by leading researchers Roy Haines-Young and Marion Potschin¹³ of Nottingham University, and identified significant challenges:

- It is very difficult to quantify goods and services given the level of complexity in the environment;
- The choice about which services to measure and how to measure them is problematic. It has to be selective, but this has a strong influence on the conclusions;
- If you are analysing services, you are looking at someone benefiting from that service. There are then ethical questions about which benefits, who benefits, and where and when the benefit is felt, and
- What we value changes over time.

An underlying assumption in all this is that invoking economic arguments is the main way to influence management decisions. However, my experience of designing and facilitating multiparty stakeholder dialogue, which is focused on a valued area of land or sea, is that each individual brings multiple values, information, know how, and ideas to the negotiation, and economic arguments are far from dominating the outcome. This perception concurs with some research undertaken in Scotland by a team from the Macaulay Institute. They found that classic economic models explained only 10% of why individuals make the decisions they do about the environment¹⁴.

The CBD Ecosystem Approach in practice

Implementing and using the CBD framework also presents significant challenges. In 2006, we facilitated the first stakeholder consensus building process that was deliberately designed to apply all 12 of the principles to the integrated management of a coastal and marine N2000 site in England¹⁵. This was complex and challenging to do. It can be critiqued for the lack of available science on ecosystem function and limits used to inform the decision-making. The scientists in the process were anxious about defining the ecosystem and debated whether the area was a small part of a larger ecosystem, an ecosystem in its own right or the sum of many smaller ecosystems (of course it is all three and recognising that in itself is good progress). But for all that, it was a good start. It made much more sense to those who live and work in the area and who use the sea for income or enjoyment. People who took part said they liked the more integrated and holistic approach - they had never seen the sense of considering only the bits of nature that counted in some remote Annex to a European Directive and ignoring what they cared about such as fish, sea horses, jobs, fun and tranquillity. Notably, decisions about management were agreed based on a vision created with pictures and words and without the need to make explicit what people valued in any comparative, monetised or numeric way.

Implementation

To deliver the CBD Ecosystem Approach we need to build capacity and skills in the following:

- **Undertaking and using participatory ‘systems thinking’ approaches and techniques**, which start by considering the system as a whole (rather than looking at bits of the system and trying to sum the parts). This includes identifying processes, linkages and feedback mechanisms between different parts of the system. (I emphasise participatory systems thinking as opposed to the ‘black box’ and specialist systems modelling).
- **Developing increased understanding of the natural system: including how to define ecosystem/s**, how the system functions, understanding ecosystem resilience, spatial and temporal scales, relationships with adjacent or linked ecosystems and natural change.
- **Shifting to see humans as intrinsic parts of the whole system** as we use, influence, and alter it, like other species and processes (albeit to a much greater extent). This includes better understanding of the human systems used in managing, using and harvesting resources, and how we influence and are affected by the ecosystems we are part of.
- **Better decision-making processes**. Essential to this will be environmental organisations learning to relinquish control and making decisions *with* other stakeholder rather than *for* them. This will require integrated, participatory and effective stakeholder processes, which bring people with different types of knowledge and know-how together to develop understanding, undertake principled negotiation, and make well-informed decisions.

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The CBD's approach, challenging to implement as it may be, should not be diluted or reduced to something that fits the comfort zone of scientists, environmental economists, regulators, resource managers and policy makers. We need to move on from a reliance on reductionist approaches including monetising what we value. We need to develop the skills listed above and get on with adaptive, creative, and innovative management at much larger scales than we have ever done before.

In summary, using the goods and services arguments to focus political minds and unlock coffers has obvious merit. But when we start getting down to managing actual rivers, woodlands, grasslands and the sea, we must exercise great caution. The environmental economic 'goods and services' approach has different values and, taken alone, seems far removed from the holistic equitable and integrated management envisioned when the Convention on Biodiversity adopted the Ecosystem Approach.

At the recent IEEM Ecosystem Services conference, a speaker (who shall remain nameless) provided some telling words as they described their large-scale ecosystem services approach project: *'we got to numbers but putting a value on something doesn't tell you what to do or how to do it'*.

Reference and notes

¹ CBD, <http://www.cbd.int/ecosystem/> . The 12 principles can be seen at <http://www.cbd.int/ecosystem/principles.shtml>; The 5 points of operational guidance at: <http://www.cbd.int/ecosystem/operational.shtml> ;

² This quote: URL: <http://www.cbd.int/ecosystem/description.shtml>

³ The beginners implementation guide at : <http://www.cbd.int/ecosystem/sourcebook/beginner-guide.shtml>;
The advanced guide at: <http://www.cbd.int/ecosystem/sourcebook/advanced-guide.shtml> .

⁴ Draft policy available until late July 2009 at http://www.naturalengland.org.uk/Images/ecosystempolicy_tcm6-10930.pdf

⁵ <http://www.millenniumassessment.org/en/About.aspx#>; <http://www.ecosystems-services.org.uk/ecoserv.htm>

⁶ http://www.hm-treasury.gov.uk/sternreview_index.htm

⁷ <http://ec.europa.eu/environment/nature/biodiversity/economics/>

⁸ <http://news.bbc.co.uk/1/hi/sci/tech/7662565.stm>

⁹ www.teebweb.info

¹⁰ <http://www.unep-wcmc.org/eap/ukNationalEA.aspx>

¹¹ Kent H. Redford & William M. Adams (2009) Payment for Ecosystem Service and the Challenges of Saving Nature. Editorial. Conservation Biology, Vol 23, No 4, 785-787

¹² http://www.dialoguematters.co.uk/ecosystems_approach_workshop.htm

¹³ Roy Haines Young and Marion Potschin (2008): England's Terrestrial Ecosystem Services and the Rationale for an Ecosystem Approach. (Defra Project Code NR0107). Project homepage: <http://www.ecosystems-services.org.uk/>

¹⁴ Kevin Urama, Wendy Kenyon, Rob Burton, & Jackie Potts (2006). Integrated Value Mapping for Sustainable River Basin Management; Economics, Ethics and Social Psychology. ATPS Special Paper Series No 22

¹⁵ Pound, D. (2006). The Nature of our Coast - Helping People and nature Thrive. NE Kent European marine site management scheme review.

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