



Ecosystem Services and Natural Capital: What they are, applications and concerns

1. Introduction

As a follow up to the LINK ETF workshop, this short paper aims to further clarify the territory around the concepts of ecosystem services (ES) and natural capital (NC). It is mainly aimed at those members who feel they would benefit from more general information about the concepts. It is not a position paper, but aims to inform members and enhance debate.

At the LINK ETF workshop (Feb, 2015) it was clear that there was convergence around some of the useful applications of these concepts, whilst there was also concern about the ramifications that accompany them and that their limitations must be recognised. The concepts are ambitious, complex and contested and they can be challenging to interpret and even more so to apply. This paper discusses the potential applications of ES and NC and the concerns that accompany them, and, it is hoped, will help LINK members come to an informed position on this complex territory. Further reading is suggested at the end.

2. Origins and descriptions

The recent rise in interest in thinking about ecosystems and their multiple functions has resulted in a modified lens to conservation and new approaches to determine the services provided by ecosystems. The related concept of natural capital has also gained popularity and both are increasingly used in policy circles. They are, however, controversial and their usefulness contested.

The ecosystem approach.

This is a holistic approach to managing ecosystems reflecting the latest thinking about ecosystem based management, and was adopted by the Convention of Biological Diversity in 2000. It includes the need for adaptive management, stakeholder empowerment and recognises that humans are part of an ecosystem. The concept is captured in 12 complementary and interlinked 'Malawi principles', designed to achieve the Convention's aim of conservation, sustainable use, and fair and equitable benefit-sharing.

Ecosystem services framework or ecosystem services approach.

This is a concept seeking to develop understanding of how nature benefits human wellbeing. The reports of the Millennium Ecosystem Assessment in 2005 popularised this way of understanding the connections between natural systems and human wellbeing, and since then there has been much work to refine the concept and explore exactly how it can be used in practice. Ecosystem services are generally divided into four categories:

- Provisioning services – such as timber production, food production
- Regulating services – such as climate control, disease control
- Supporting services – such as crop pollination, nutrient cycling

- Cultural services – such as recreation

Natural Capital.

Natural Capital comprises the stock of natural resources, both biotic and abiotic, from which ecosystem services flow. It was conceived by ecological economists who were trying to find a way to recognise that natural resources which are outwith the market are also a vital part of our economic system. In contrast to traditional economics, it is argued that non-human life produces essential resources and ecological health is essential to the sustainability of the economy. When some classes of ecosystem services are appropriated by humanity at an unsustainable rate, the stock of natural capital which provides them will be depleted.

Natural capital accounting.

Natural capital accounting is the practice of auditing impact on and benefits gained from natural assets. As a concept, it is gaining recognition with the business sector and other institutions that routinely produce accounts. Natural capital accounts can be in monetary units or other units appropriate to assessing the quantity and/or quality of an asset.

3. Quantification of environmental assets and services

Much work in the field of ecosystem services has been devoted to thinking about all the different ways in which they contribute to our wellbeing and these descriptors alone have added new dimensions to how conservation can be interpreted and promoted. At times, it is useful to be able to quantify these benefits. For example, tonnes of carbon stored in peatland or quantities of water purified.

4. The economic valuation of nature

Environmental economics has been developing methods to value aspects of the environment since the 1960s in order to address the failure of markets to incorporate these values. There are clearly extensive challenges in trying to do this, and a number of approaches and methods have been developed.

It is not possible to reliably calculate a 'total economic value' for a species or an ecosystem. However, often an estimate can be made for the value of an aspect or service of that species or ecosystem. For example, the pollination services of bees in financial terms can provide an argument in favour of banning harmful pesticides. This valuation takes one service that bees provide, namely pollinating crops, for which it is not too difficult to calculate a conservative value.

5. Creating a market for nature

Creating a market for nature is a separate development requiring property rights and usually a brokerage service but is seen by some as a natural progression from the economic valuation of aspects of nature. Markets for carbon have been created under schemes such as the EU Emissions Trading Scheme (EU ETS) and the UN Reducing Emissions from Forest Degradation and Deforestation (REDD). Biodiversity off-setting is also being trialled in some parts of the world. LINK ETF will produce a discussion paper about off-setting.

6. Useful applications of ES/NC

- In general they highlight the importance of our environment to wellbeing and economic activity.

- As concepts they help us express the economic and wellbeing costs of environmental destruction or the economic and wellbeing benefits of environmental enhancement.
- They can engage new audiences.
- For ENGOs the ecosystem approach, guided by an understanding of ecosystem services, can be useful at the programme or project level. It offers a more multi-functional approach to conservation, highlighting how the environment, people's wellbeing and economic opportunities and resilience are all connected. Landscape scale projects by Scottish Wildlife Trust are using this approach – it has not driven their overall conservation objectives but has 'added value' and resulted in fruitful engagement and partnerships.
- They potentially open up new revenue streams for conservation organisations from beneficiaries of supplied ES such as health authorities.
- NC accounting enables businesses, government and other organisations to include the environment in their accounting, highlighting the environmental impact of the organisation and their reliance on natural assets.
- Assessment of the status of NC can guide investment decisions, and be built into credit ratings. It can also provide a barometer for a nation's natural wealth and provide a useful metric for 'success'.
- Quantification of ES or NC can provide information to set the rates for taxes and subsidies. Land management subsidies can be better aligned to provide public goods from diverse ecosystem services in the long-term.

7. Concerns about ES and NC

A summary of the concerns and challenges:

- They are complex and challenging concepts, both conceptually and to operationalize.
- They are utilitarian concepts and economics as the main criteria in decision making is further elevated.
- They are misinterpreted as able to capture the full value of nature.
- Conservation related policy is driven by optimising ES and NC.
- Existing regulations and non-market mechanisms, such as protected areas and planning policy, will be deemed less important.
- The pathway to commodification of nature and a market in nature is opened.

Ecosystem services and natural capital deal with the interface between the environment and human wellbeing and the environment and the economy. They are complicated both conceptually and, probably even more so, in operationalization. Ecosystems are complex entities '*a biological community of interacting organisms and their physical environment*', existing at multiple scales. There are considerable difficulties in describing this complexity in metrics.

They are utilitarian concepts, attempting to encapsulate the benefits ecosystems deliver to people, and for some people, whose motive for conservation is strongly linked to an ethical framework that puts nature 'beyond value', the concepts of NC and ES are challenging or unacceptable.

When used to make an 'economic' case for conservation, ES/NC elevate economics as a basis for decision making. This is contrary to the type of decision making many ENGOs would like to see which is based on moral, social and environmental grounds, as well as economic.

There is a concern that they are seen as able to capture the full value of nature. There are two main reasons why these approaches can not provide a 'total economic value'. First, several aspects of 'cultural services' especially 'intrinsic value' are very difficult to value reliably. Second, there is much that is unknown about ecosystems and how they benefit us or how they might benefit us in the future. They do not encapsulate tipping points or environmental limits. Valuations should therefore make explicit that they only represent certain aspects or elements of an ecosystem.

Related to the features and limitations of ES/NC, it is important that policies should not be solely driven by optimising ES/NC. Many people in positions of power and influence are now seeing the delivery of ES as the prime target output of nature conservation - rather than the maintenance and enhancement of biodiversity. Thus all those elements of biodiversity that are not, or are not known to be, of direct utilitarian value to humanity are deemed of lesser value. It is feared this will result in further losses of biodiversity. More traditional approaches such as protected areas will be side lined which have been the cornerstones of conservation.

Finally, there are concerns that the concepts of ES and NC will lead to financialisation of nature and a market in nature. As mentioned above, this will be discussed in a separate LINK paper.

8. On-going developments

In Scotland, the ESCom project aims to become a community of practice for ecosystem research, decision making and natural resource management. This is an evolving initiative, open to anyone and taking direction from its members. It is a forum which could be used to enhance mutual understanding of positions of various stakeholders and hold constructive debate. LINK is participating in ESCom through Phoebe Cochrane.

Regarding NC accounting, there is work underway through the IUCN, World Forum on Natural Capital and Green Economy Coalition to support the development of a 'charter' (a set of principles) and a 'protocol' (step by step guide). The Natural Capital Charter will provide a set of guiding principles – an ethical framework – for the implementation of activities involving natural capital valuation and will be designed to provide a useful context for the Natural Capital Protocol.

9. Conclusion

This paper has attempted to give a balanced overview of the concepts of ecosystem services and natural capital. It has described a range of potentially useful applications and also how they should be framed, their limitations and concerns about them. In the use of and discussion about these concepts, clear communication is important. There is an increase in appreciation of differing views amongst LINK members and to move forward in this complex and somewhat controversial territory, it is important that this awareness is reflected in communication. When the concepts are used, the specific application or tool should be framed, making explicit its purpose and limitations. Likewise, when raising concerns about the concepts, these should be specific and qualified.

10. Further reading/useful sites

<http://www.theguardian.com/environment/georgemonbiot/2014/jul/24/price-nature-neoliberal-capital-road-ruin>

<http://www.theguardian.com/sustainable-business/natural-capital-neoliberal-road-ruin-george-monbiot-experts-debate>

<http://www.theguardian.com/sustainable-business/blog/framing-natural-capital-economy-ecology-not-competition>

<https://escomscotland.wordpress.com/about-3/>

<http://www.naturalcapitalcoalition.org/about.html>

<http://naturalcapitalscotland.com/>
