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Ecosystem services conceptual foundations: A briefing note

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Ecosystem Services Conceptual Foundations: A Briefing Note

Kerry Turner

CSERGE Working Paper 2012-06



CSERGE

Centre for Social and Economic Research on the Global Environment

**Ecosystem Services Conceptual Foundations:
A Briefing Note**

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CSERGE Working Papers

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Ecosystem Services Conceptual Foundations: A Briefing Note.

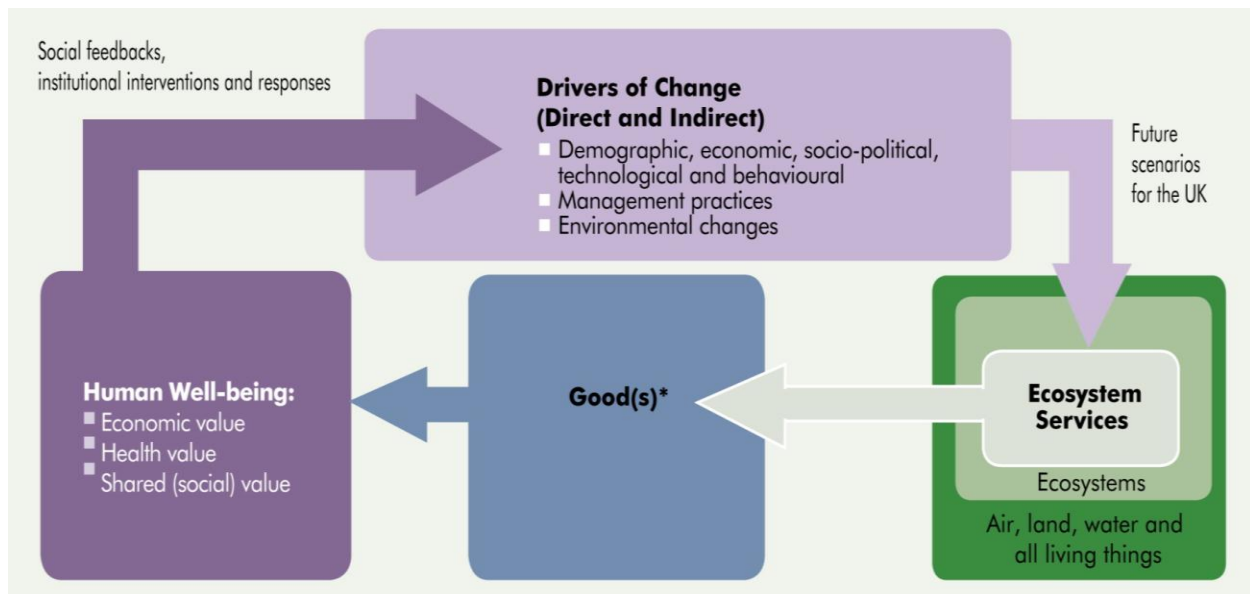
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September 2012.

The purpose of this note is to set out the underlying philosophy of the ecosystem services approach as it is applied in UK policy circles. The aim is to clarify some flexible 'ground rules' which should guide both the use of this type of decision support tool itself, and the interpretation of its results by the policy community and society at large. The approach taken is built on two key foundation principles: pluralism and pragmatism, which are explained in more detail in this note.

Following international work pioneered by the Millennium Ecosystem Assessment (2005), the UK National ecosystem Assessment (NEA, 2011) was the first interdisciplinary analysis of the UK environment in terms of the benefits it provides to society and the nation's continuing economic health and wellbeing. It focused on the processes that link human societies and their wellbeing with the environment, and inter alia on the key role ecosystems play in delivering a diverse set of services which directly and indirectly underpin economic progress and human 'happiness'. Figure 1 summarises the overall assessment approach.

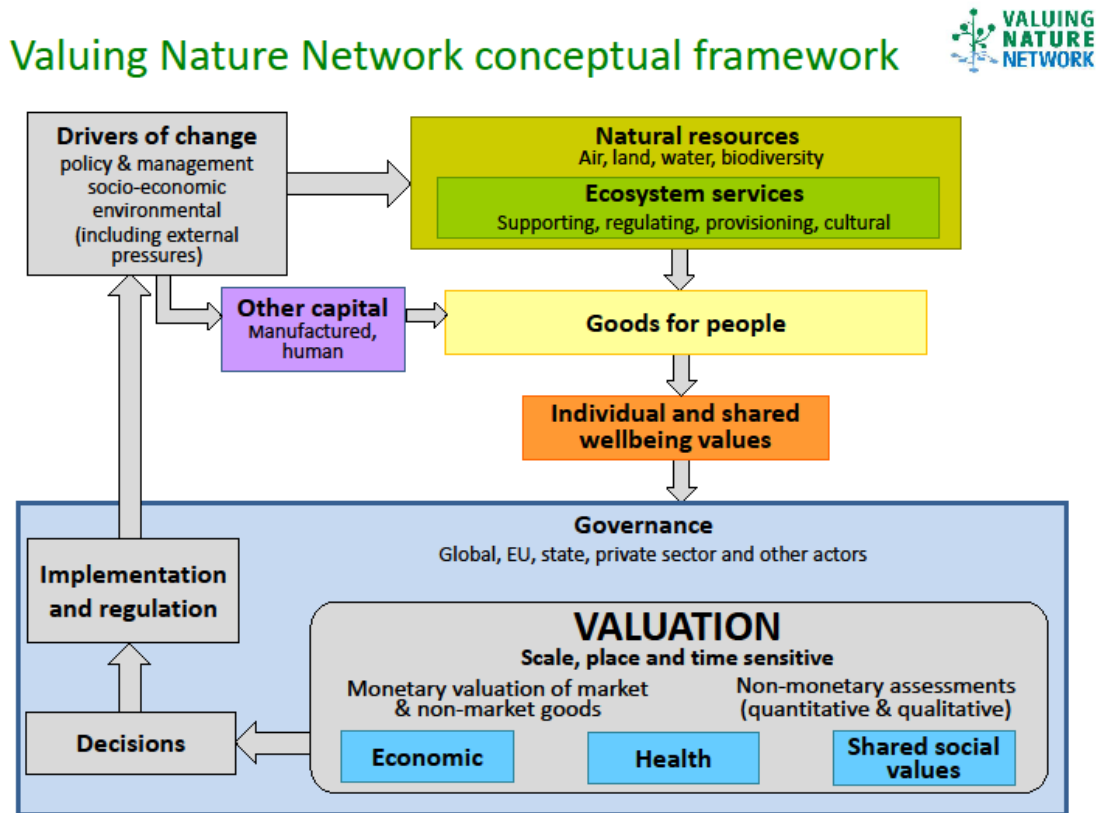
Fig 1 NEA conceptual framework



NEA (2011)

The second phase of the UKNEA (2012-2014) seeks to build on the conceptual and empirical platform for the ecosystem services approach laid down in phase 1. Figure 2 (sourced from the Valuing Nature Network (VNN) initiative) presents an overview of the approach to be taken.

Figure 2 Ecosystem services approach



VNN (2012)

The strategic goal is to build a robust evidence-based case for the embedding of the ecosystem services approach into the existing policy process and the workings of the wider contemporary society. But to foster such a policy switch in practice, a re-orientated enabling environment needs to be created. New and existing policy tools will need to be combined to create a mix of regulations, incentives for technological innovation, financial investment and education and the active participation of all relevant interest groups and civil society.

The achievement of this strategic goal will contribute to a better assessment of the value and significance of the flow of ecosystem services over time, as well as an indication of the stock position (natural asset check) at any given point in time. Genuine economic progress cannot be sustainably achieved without good environmental husbandry principles and practice. The UKNEA assessment, for example, can contribute to a fuller quantification and recognition of the true 'comprehensive wealth' of

the UK (Gross Domestic Product (GDP) plus) and how it is changing over time. The NEA initiative can also help to fulfil a set of key policy objectives: the enhancement of societal wellbeing; promotion of greener business practices and macro economy; progress towards more food water and energy security; and movement towards 'strong' sustainable development in the future.

The UKNEA champions a pluralistic and pragmatic approach in its attempts to contribute to a decision support system for sustainable development. The ecosystem services methodology adopted within the assessment has evolved from an earlier natural science-based analytical framework known as the 'Ecosystem Approach' which advocated a much more comprehensive and integrated approach to environmental management. The next step was to augment the systems-based science by the inclusion of social science and humanities to link ecosystem functioning and its outcomes to the provision of services (e.g. clean water, flood protection, recreation and amenity, health benefits, cultural asset appreciation etc) which improve human welfare. So the underlying aim is not so much to maximise biodiversity conservation per se but to rather manage the rate of change in ecosystems (structure, species composition and processes) as economic and ecological systems co-evolve through time.

Following the general schema set out in figure 2, coastal ecosystem stocks (the ecosystem structure and processes and links to the abiotic environment) possess high biological productivity and provide a diverse set of habitats and species, with a consequent flow of ecosystem services (the outcomes from the functioning of ecosystems) of significant value ('benefits') to society. A combination of basic processes and 'intermediate' services provide the final services of relevance to human welfare (gains/losses = 'benefits'). Ecosystem services benefits are the 'exports' from the ecosystem sector to the human economic sector. The term 'intermediate' services should not be interpreted as signifying lesser significance but rather as a necessary signal that provides technically correct guidance to avoid double counting when services are valued in economic and monetary terms (Fisher, Turner and Morling, 2009). The scope of delivered coastal final ecosystem services (and therefore the valued goods and benefits) is very wide, ranging from food to carbon storage, coastal protection/defence and recreation and amenity – see figure 3.

Figure 3: Ecosystem Services Conceptual Framework

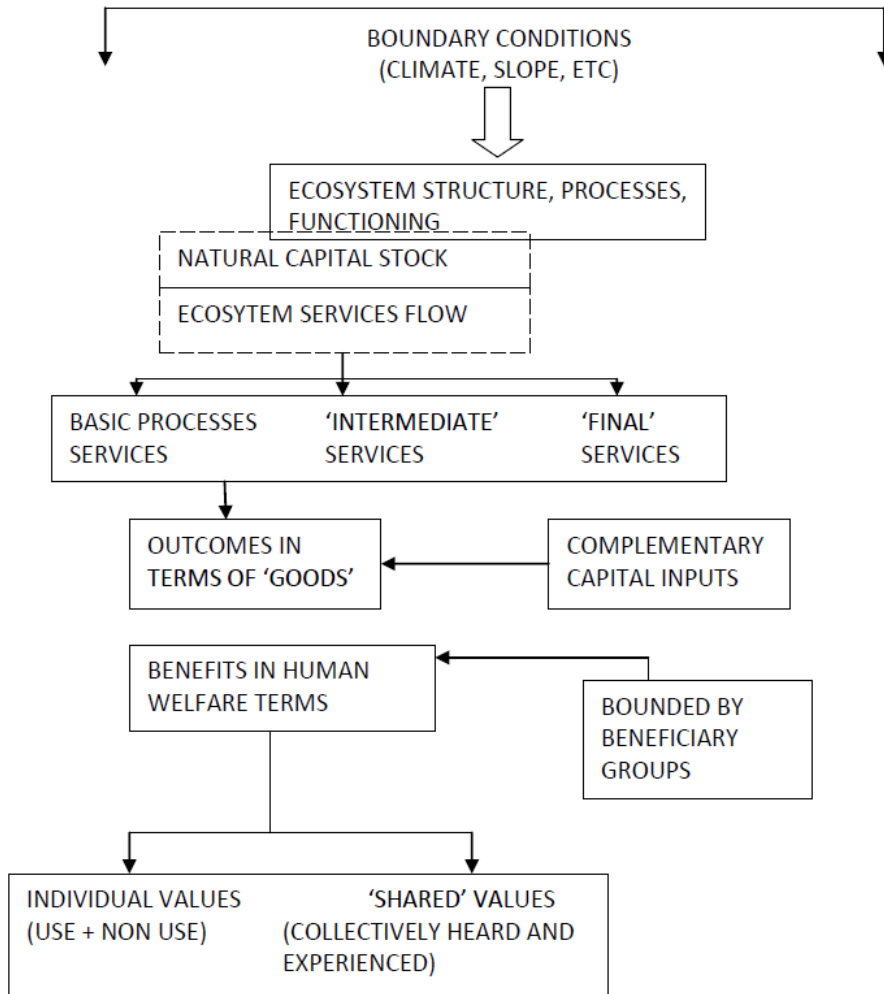


Figure 4 illustrates the important distinction between 'intermediate' and final services for coastal/marine contexts and figure 5 presents an overall classification of coastal/marine ecosystem services.

Figure 4 Example of relationships among representative intermediate services, final services and benefits

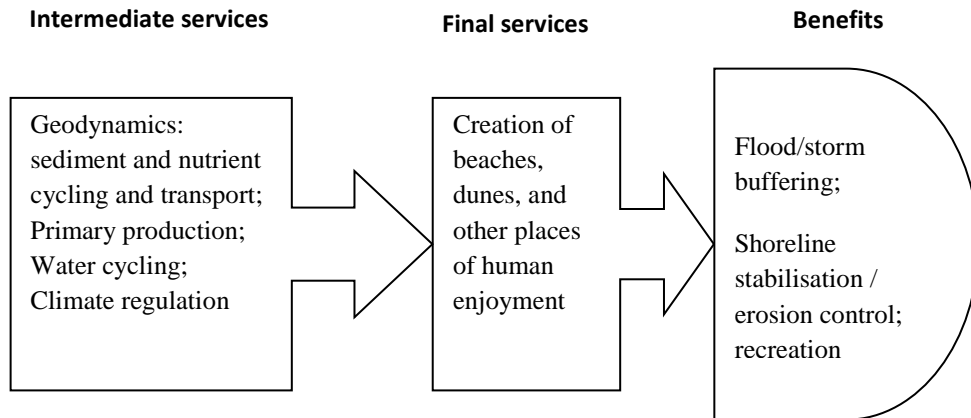
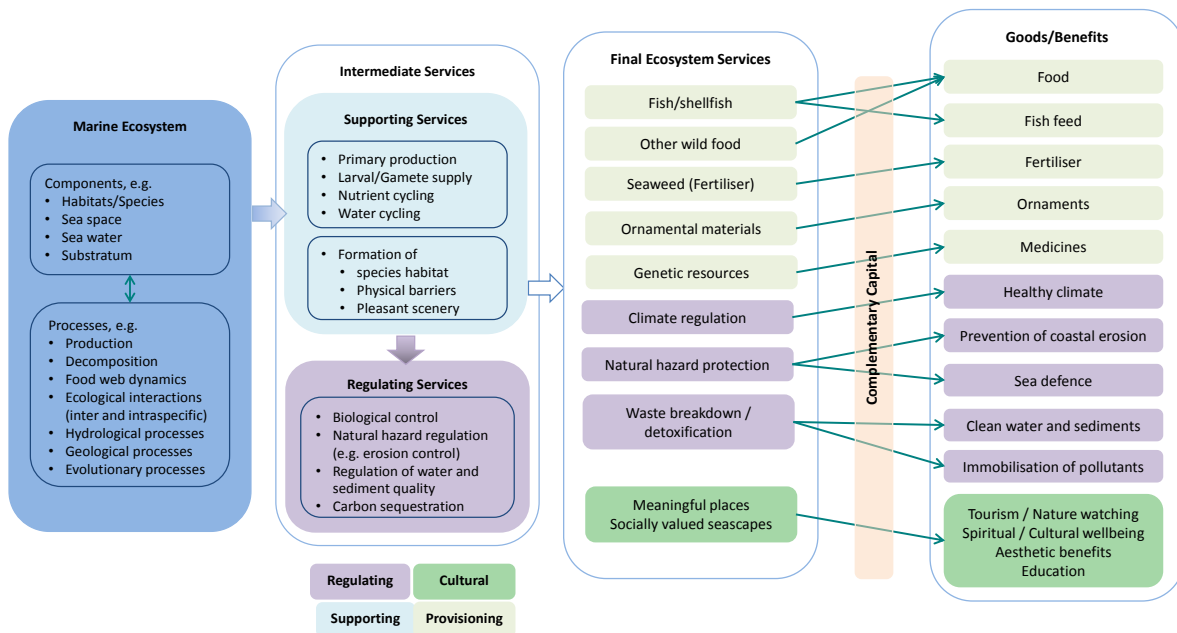


Figure 5 Classification of Coastal and Marine Ecosystem Services (Source: Framework Section of VNN document- R.K. Turner et al 2012, Coastal Zone Ecosystem Services: from science to values and decision making ,a conceptual framework, forthcoming.



A pragmatic stance was taken in order to bring the ecosystem services concept more fully into the collective consciousness of government (particularly finance ministries) and business, so the methodology deliberately allows for the monetary valuation of ecosystem services in an economically defensible way. It was also agreed that enough information exists to justify starting to manage our ecosystems more sustainably and that there is growing evidence of the benefits of doing so. At the same time due recognition is given to the need for precaution because of the scientific uncertainty which

shrouds how certain ecosystems may be adversely affected by human development pressures causing them to collapse or lose significant productivity potential. Many environmental conservation and trade off situations are also highly contested by a number of interest groups. It is also the case that a number of ecosystem services related to culturally important assets such as ,for example, symbolic landscapes and buildings cannot be meaningfully expressed in monetary terms. In this context the UKNEA is looking at alternative ways to build up evidence to illustrate the magnitude and significance of cultural ecosystem services. Nevertheless, if it is accepted that we are moving increasingly from having to deal with relatively simple, safe and slowly changing environments, towards much less benign environmental conditions and possible impacts, then we cannot wait for complete information. Decision making will have to take place under what are called 'bounded rationality conditions' i.e. we have to do the best we can on the basis of the available information and accept that finding the optimal solution is currently beyond us.

The combination of the need for an interdisciplinary research effort and the diverse characteristics displayed by the many ecosystem services that nature provides, and not mere eclecticism, led to the adoption of a pluralistic perspective for the UKNEA. The aim was to give some focus to an extensive field of sometimes overlapping theory and empirical applications from a range of disciplines, natural science, social science, humanities, ethics and ethical reasoning. Pluralism allows reasoning, analysis and methods to be adapted to particular contexts and circumstances. Pluralism is required in order to allow the UKNEA research to investigate, for example, how value can be assigned to nature, either through individuals and their perceptions, or via collective group/community expression. The latter mechanism provides what the NEA has called 'shared values' and it is attempting to build an evidence case for such values, as well as identifying means for the incorporation of such values (if they exist) into practical decision making.-see figure 2.

Environmental philosophers emphasise that nature-based value has multiple dimensions and that it therefore can be discerned and evaluated in a number of different ways (monetary, quantitative non-monetary and qualitative measures). Each of the value dimensions has validity in its own domain and decision making may involve consideration of multiple domains depending on the context and circumstances. The philosophy literature has illustrated a generic fourfold nature-value typology: anthropocentric instrumental value; anthropocentric intrinsic value; non-anthropocentric instrumental value; and non-anthropocentric intrinsic value. The UKNEA is focused primarily on the two anthropocentric categories, with the instrumental value encompassed by the economic concepts of use and non-use value. The anthropocentric intrinsic value notion is a culturally dependent concept which is linked to human stewardship of nature motivation and which requires a human to ascribe intrinsic value to non-human nature. The economic concept of 'existence' value may overlap into this category. Existence value derives from individuals who feel a benefit from just knowing that , for example, an ecosystem and/or its component parts, exists and will continue to exist somewhere on the planet into the future.

Conventional economic thought is anchored to individualism and instrumental values. So the value that counts is that informed by an individual person's preferences which are usually assumed to be fixed and held prior to some choice/valuation decision. Information relevant to that decision context that is newly

acquired by any given individual may result in a change in preferences or their ordering. Some analysts have argued that in the environmental change context, individuals may exhibit so-called lexicographic preferences (related to ethical positions and concerns over rights and interests held by humans and non-humans). Such preferences it is argued cannot be changed via compensation measures if trade off decisions are required, they are immutable.

From the behavioural sciences, we now know that individuals are as much influenced by 'others' (with whom they are in contact via groups, clubs, neighbourhoods and other social networks) as they are by their own individually held values, preferences and rationality. It also seems to be the case that preferences can be changed because of social network interactions and collective actions. Social networks help to build so-called social capital (the institutions, relationships and norms that shape the quantity and quality of a society's social interactions and overall wellbeing) which is the glue that holds society together. Individuals may therefore hold 'other' regarding preferences with altruistic or bequest motivations.

Deliberative arrangements (citizen juries or less formal focus groups etc) can lead to individual value/preference changes but this is still one step behind the claim that so-called shared values exist. Following the deliberative process the individual value basis may still remain intact, albeit now in a changed form, or certain individuals may opt out of any outcome that is arrived at through deliberation (maybe even refusing to take part at all). In these cases their individualism and sense of sovereignty are dominant. Shared values (expressed on and through a collective basis) could arguably exist, for example, if the group in the deliberative process collectively agreed on a group valuation via consensus, or by majority vote. In other words, all or a majority of individual participants agreed to a common value outcome, even though their own individual personal inclination may have been to support a different value (+ or -). These individuals give up their individualistic value in favour of a different shared value expressed as a collective agreement. Some would argue that they are now acting as citizens rather than consumers.

Limitations of the shared value notion and approach, if it is proved to be valid and robust, include the following; that the deliberative groups are numerically small, are open to manipulation by more dominant personality types and pose issues of democratic representation. They may therefore be best suited to 'local' environmental problems and trade off situations and less well suited to regional to national scale strategic decision making. Cultural ecosystem services values can be seen in one way as an expression of collective/shared values that are embedded in a culture and tradition of a locality, region or nation over historical time periods. They are expressed in art and other media forms, stored in archives and collectively transferred over generational time within communities of varying scales.

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