

## ECOSYSTEM SERVICES AND NATURAL CAPITAL

The term Ecosystem Services is used to describe the direct and indirect benefits of ecosystems to humanity. The concept has been developed partly to address findings of the Millennium Ecosystem Assessment that 60% of the world's ecosystems are degraded or used unsustainably.<sup>1</sup> By viewing the ecosystem as a service, we can translate threats to ecosystems and the environment into measures of value to human security, health and wellbeing.

**Ecosystems services play an essential role in public health: from helping to meet air and water quality standards, to food provision, climate change adaptation, and promotion of physical, mental and emotional wellbeing. Public health professionals have a key role to play in their protection, and in turn the concept provides valuable tools for demonstrating the returns on investment of protecting the environment**

### Ecosystems as Natural Capital

**Capital:** Natural Capital is an approach to monetising the value of ecosystems services. Ecosystems, when viewed as 'assets', can become sources of revenue. They can then be managed in a way that generates income, so that any investment in protection and maintenance is covered by revenues. For example, water is an ecosystem service that is routinely paid for, so that investments in the protection of river catchments, and of protecting and improving water quality, generate income from customers. Another example is charging for entry to national parks: in 2014, the 15 national parks in Great Britain had 73 million + visitors who spent £5.5 billion.<sup>2</sup>

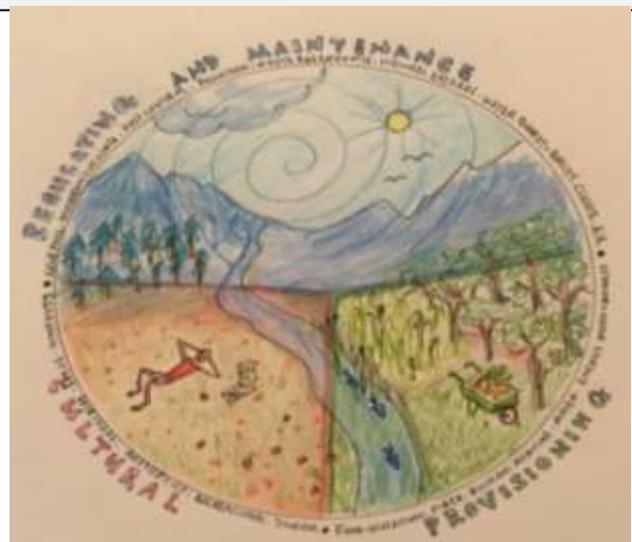
### Environmental economist Dieter Helm describes 3 key benefits of thinking in terms of natural capital:

- 1) It is asset-based: nature provides us with huge benefits for free, which have value.
- 2) It demonstrates that the environment is part of the economy, rather than economic growth and protecting the environment being unrelated.
- 3) Focusing on maintaining natural capital, makes a clear distinction between renewable and non-renewable assets - important when planning for sustainable development.<sup>3</sup>

### What are Ecosystems Services?

Ecosystem services are generally categorized into four main types:

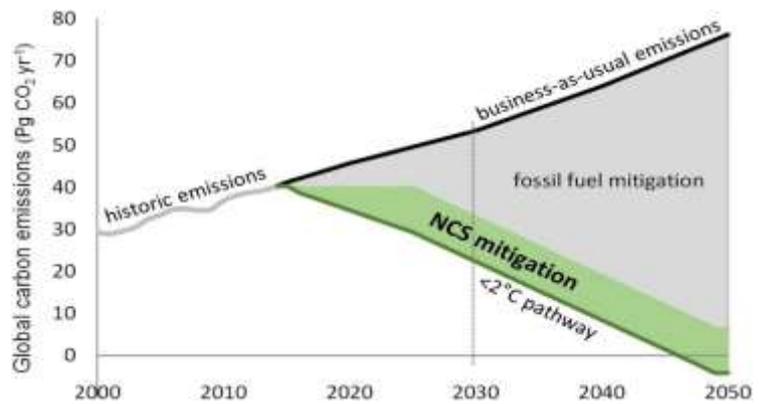
- Provisioning:** products obtained from ecosystems such as food, fresh water, wood, medicines – these often have a market value.
- Regulating:** the benefits obtained from the regulation of ecosystem processes such as climate and natural hazard regulation, water purification and waste management, pollination and carbon sequestration.
- Habitats:** including habitats for species and maintenance of genetic diversity.
- Cultural:** non-material benefits, such as spiritual enrichment, recreation, tourism, a sense of place and aesthetic values



**Natural Capital Accounting** is a tool to measure the changes in the stock of natural capital sources that would otherwise not be accounted for, and to integrate the value of ecosystem services into accounting and reporting systems. The Common International Classification of Ecosystem Services (CICES) is a new classification of ecosystem services being developed to facilitate integration of ecosystem services into environmental accounting worldwide.<sup>5</sup>

### Global Commitments to Ecosystems

The Paris Climate Accord is a global agreement to limit global warming to below 2C above pre-industrial levels. Ecosystems services, and in particular their carbon sequestering properties, have been identified as a cornerstone to achieving this, alongside steep reductions in fossil fuel use. It is estimated that *'if natural climate solutions are mobilized over the next 10 to 15 years, they could provide 37 percent of the needed mitigation for global climate targets'*.<sup>4</sup>



**Fig.1** Contribution of natural climate solutions (NCS) to stabilizing warming to below 2 °C.

### How Can We Put a Price on Nature?

The natural capital approach has been criticized for valuing nature for its usefulness to humanity, rather than its intrinsic value. Even with regards to people alone, we derive many non-material benefits from nature that are difficult to measure and integrate into ecosystems frameworks, eg. spiritual enrichment, recreation and aesthetic appreciation. Various techniques address this:

#### Culturomics

The cultural value placed on a species can be measured by the frequency with which it is searched for and appears on social media. Its proponents suggest that culturomic assessment could be integrated into decision-support tools. This approach is especially useful for estimating reputational risk to organisations if they damage habitats, which in turn can be translated into a financial value in protecting them.<sup>6</sup>

#### Hedonic Pricing

This method is based on the theory that the value of a good is based on the sum of its attributes. It is widely used to determine the value of green space to home buyers by including proximity to green space as a variable whilst controlling for other attributes (size, build quality, transport links etc). In London this method was used to estimate that the presence of a regional or metropolitan park within 600 metres adds 1.9% - 2.9% to total house value.<sup>7</sup>

#### Preference surveys

These are proxy measures of intrinsic value which can be elicited by asking people their preferences, or through photo selection if conducting a survey. This enables elicitation of trade-offs between different value dimensions, and of preferences of different groups.<sup>8</sup>

#### The EU: Making Natural Capital a Priority

The EU have developed an Environmental Action Programme. Its first priority is to protect, conserve and enhance the Union's Natural Capital. The EU are developing a natural capital accounting system decision making tool, and have produced a framework for Mapping and Assessment of Ecosystems Services, to standardise approaches across member states.<sup>9</sup>

#### The UK – Protecting Ecosystems and Health

The UK has specific challenges to taking a 'natural capital' approach. One of these is deciding what is 'natural', as intensive development and land use mean the UK is at best described as 'semi-natural'.

Some of the UK's ecosystem services are severely threatened, due to biodiversity loss, water security, risks associated with sea level rise, and soil degradation.<sup>1</sup> The UK government's 25-year Environment Plan seeks to measure and value a wide range of natural capital benefits, e.g. flood protection, recreation and improved water and air quality. Initiatives include a new environmental land management system rewarding land managers for preserving natural capital, and applying a 'polluter pays' principle more widely.<sup>10</sup>

The Office of National Statistics (ONS) produce annual natural capital accounts which estimate the number of deaths averted by UK ecosystems services in pollution removal and protection against floods and extreme weather events. They also value the amount of carbon sequestered, renewable energy produced and water purified by ecosystems – services with a direct benefit to public health.<sup>11</sup>

## References

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2. Committee on Climate Change, Natural Environment and Assets, UK Climate Change Risk Assessment, 2017 [<https://tinyurl.com/ycftzwlo>]
3. Helm D, Natural Capital, [www.dieterhelm.co.uk/natural-capital/](http://www.dieterhelm.co.uk/natural-capital/) [Internet], 2018
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9. European Commission, Mapping and assessment of ecosystems and their services: an analytical framework, Jan 2018
10. HM Government: A Green Future: Our 25 Year Plan to Improve the Environment, 2018
11. Office for National Statistics, Developing Estimates for the Valuation of Air Pollution Removal in Ecosystem Accounts, July 2017

### FPH General CPD Questions

1. What did I learn from this activity or event?
2. How am I going to apply this learning in my work?
3. What am I going to do in future to further develop this learning and/or meet any gaps in my knowledge, skills or understanding?