Office for National Statistics

Article

Natural capital accounts roadmap: 2022

Assesses achievements since the publication of the natural capital roadmap, outlines various challenges, and sets out priorities for the next phase.

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1 . Main points

- We met the targets in the previous roadmap, notably the inclusion of natural capital accounts in the UK Blue Book since 2020.
- We will undertake the preparatory work needed to produce estimates of some of the economic impacts of climate change in 2024, towards capturing all such costs in the natural capital accounts.
- We will adapt the natural capital accounts for inclusion in extended national accounts most notably with estimates of degradation of assets where possible.
- We plan to produce the natural capital accounts with greater spatial granularity.

2 . Overview

In the Department for Environment, Food and Rural Affairs (Defra) white paper The Natural Choice: securing the value of nature 2011 (PDF, 2.6MB) a commitment was made to the production of natural capital accounts for the UK:

"We will put natural capital at the heart of government accounting. We will work with the Office for National Statistics to fully include natural capital in the UK Environmental Accounts, with early changes by 2013. In 2012 we will publish a roadmap for further improvements up to 2020."

In 2012, the Office for National Statistics (ONS) and Defra began collaborating on the development of natural capital accounts for the nation. The project to develop the natural capital accounts is now 10 years old and a great deal has been achieved.

Natural capital accounts require the measurement of a wide range of natural resources and processes across the UK. Environmental observations must then be linked with socio-economic data to measure their impact on the economy and society. The complexity of the accounts demands an interdisciplinary approach and working collaboratively. This development has benefitted from the support of a wide range of organisations from across government, academia, non-governmental organisations and the private sector.

The devolved governments have supported these developments. The Scottish Government commissioned us to produce natural capital accounts for Scotland, and we have supported the Welsh Government work through their Environment and Rural Affairs Monitoring and Modelling Programme.

The natural capital accounts currently use 275 datasets from 67 different providers. The management and development of those relationships and the data is an important and challenging aspect of developing natural capital accounts. The support of those data providers has been invaluable to the production of the accounts.

With stakeholders' support, the natural capital accounts project met all of the targets in the previous roadmaps and has provided a world-leading set of accounts.

There is increasing interest in the production of national natural capital accounts following the HM Treasury-commissioned Dasgupta Review of the Economics of Biodiversity, updates to UN guidance on accounts production, and their proposed inclusion in the Convention on Biological Diversity reporting metrics. In this context, we intend to do even more to ensure the natural capital accounts meet their full potential for informing policymakers and the public.

In this roadmap we will recount the work that has been achieved to date on the natural capital accounts, reflect on some of the lessons we have learned, and present our strategic priorities and plans for the next phase of the accounts.

Natural capital accounting at a glance

Gross domestic product (GDP) only tells part of the story of UK progress. We need to account not just for market output, buildings and roads, but also for our natural capital: the ecosystems, green spaces and landscapes, that provide us with a range of economic and non-economic benefits.

This includes changes to extent and condition of the physical environmental assets, such as wetlands and forests, and to the value of services provided by healthy ecosystems, such as timber, carbon sequestration, air filtration and recreation.

Natural capital accounts estimate what nature does for us. The ONS's natural capital accounts cover the environment in which we live. This is measured in terms of the stream of goods and services nature provides to us, and focuses on the condition and extent of the habitats that will maintain that provision into the future. For instance, while the fish you eat is a good provided by nature, the fish that remain in the sea, to produce fish next year, are the asset.

Natural capital accounts assess the size and condition of our natural assets, and the physical and monetary values of the services provided to us by nature. For example, in recent years they have shown:

- in 2019, the stock of the aspects of UK natural capital we are currently able to value was an estimated £1.2 trillion
- in 2019, the net benefits, in terms of climate change emissions alone, of restoring 55% of peatlands to near natural condition were estimated to have a present value of approximately £45 billion to £51 billion
- the value of health benefits associated with outdoor recreation in the UK was estimated to be between £6.2 billion and £8.4 billion in 2020
- the extent of UK urban environments increased 30% between 1990 and 2019, while enclosed farmland fell 5% over the same period
- in marine habitats, fossil fuel asset values were lower than both recreation and carbon sequestration separately

The accounts follow an internationally agreed coherent, comprehensive and consistent framework with which to organise and analyse statistical evidence from a wide range of sources. This provides benefits for international comparability, monitoring and identification of data gaps.

The natural capital accounts use the same accounting approach as used for measuring the economy, enabling comparability between economic and environmental information. However, natural capital accounting goes beyond conventional accounting measures. Although some benefits of ecosystems will be implicit in measures of GDP, they account for a range of outputs and services not traded in markets at all. They therefore offer an assessment of the role played by ecosystems in providing a range of other benefits to human well-being that are commonly unpriced and not considered in national-level economic reporting and analysis.

The natural capital accounts are developed in line with international guidance, in particular the principles set out in the United Nations System for Economic-Environmental Accounting - Ecosystem Accounting (SEEA EA) framework. This framework was developed to respond to the growing demand for information in policy areas such as sustainable development, resource use and land management.

3 . Major progress made over the last 10 years

We pledged in 2012 to include natural capital accounts in the environmental accounts within the overall national accounts by 2020. We achieved this, publishing statistics in the Blue Book, which presents a full set of economic accounts (national accounts) for the UK, in October 2020.

We are now able to produce high-level, national-scale estimates and monitor changes over time. This and the previous roadmap also set a number of smaller milestones – all of which were also met.

Notable achievements over the last 10 years include:

- regular production of monetary accounts for 13 ecosystem services
- national natural capital accounts for Scotland
- inclusion in the national accounts "Blue Book"
- habitat accounts for the eight broad habitats
- capacity to provide analysis to support pandemic policy
- a separate peatland account and restoration cost account
- UK-wide condition and extent of nature accounts

4 . Strategic focus for future development

Having laid the statistical foundations for UK natural capital accounts, we will do more in the coming five years. Our work will be aimed at improving their relevance and usefulness to UK policymakers, environmental professionals across all sectors, and the public.

The traditional applications of environmental valuation lie in public policy appraisal. Public policy appraisal usually focuses on a single decision. The need for the valuation is identified first and the analysis developed to meet that demand. The appraisal is often in economic terms and so valuing the environment helps to reflect impacts in analyses that would otherwise ignore it.

An important argument for including environmental valuation in accounting is the same: to make environmental change visible in (primarily) economic decisions. The big difference between policy appraisal and accounting is that the account is produced with the expectation that it will find purposes elsewhere rather than to meet a specific demand. This places a greater onus on producers to make these data accessible and promote its useful properties. International guidance has been developed on how to estimate natural capital accounts, but not on the specific ways in which they might be made most usable for stakeholders.

We have identified four main strategic focuses for our natural capital accounts.

Macroeconomic policy

In May 2022, the Office for National Statistics (ONS) published a work plan for creating new measures of "inclusive income" for the UK. This outlines how we propose to integrate natural capital accounts estimates alongside human capital and household accounts with traditional national accounts estimates.

This is in part a response to the Dasgupta Review. This called for the creation of "inclusive wealth accounts" as a measure of the sustainability of the management of all assets.

The natural capital accounts already provide some of the data that are necessary to create inclusive wealth accounts, but some further work is necessary. In addition, we will need to carry out work considering the range of macroeconomic decisions, which would benefit from including natural capital data and how it might affect them.

The Dasgupta Review argues that changing the basis of macroeconomic statistics will improve macroeconomic decision-making. It does not specify which macroeconomic decisions will be influenced or how. Understanding how these statistics could be used will help shape their development and provide a basis on which to promote that work with macroeconomic decision-makers.

Households

Environmental damage can seem like something that is happening globally or somewhere far away. It can be very difficult to find statistics or data about the environment around our homes, how it affects us, or how it is changing.

The natural capital approach focuses on people's relationship with nature, and so our statistics and data often centre around households and neighbourhoods. This means that we have been able to produce interactive data visualisations showing how nature benefits neighbourhoods based on a postcode lookup. These have been among our most popular outputs.

We intend to make the production of accessible interactive and neighbourhood-based articles an integral part of our work in the future. In this way we hope to be able to keep the public informed about their local environment and its importance to their neighbourhood. Further improvements to our core methods will be necessary to enable this work.

Local authorities, private sector and charities

Local government is responsible for large areas of green infrastructure, from roadside verges to public parks. But the benefits of this green infrastructure are not always measured. At present, the majority of the natural capital accounts cannot be produced at the local authority level. Yet we have seen substantial demand from local government for statistics and data for their areas of responsibility.

Environmental non-governmental organisations are also very significant landowners with an interest in the data we produce. Given their wider interest in environmental protection there are a range of ways in which they might use our data if they can be published at scales relevant to their decision-making.

Increasing numbers of private companies are investing in business natural capital accounting. These accounts can be very complicated given the range of scales and impacts different businesses might have. Producing data with higher spatial resolution can help support their production.

Environmental policy and government appraisal

The overall value of the UK's natural capital – as methods stabilise – can provide a useful overall monitor of environmental protection. They can also provide useful inputs to public policy appraisal as supported by the Department for Environment, Food and Rural Affairs (Defra)'s Enabling a natural capital approach work.

A static data time series, however, is not always sufficient for most policymakers. If the natural capital accounts show that the value of forestry's timber production had declined or grown, the natural next question is "Why?".

We will therefore continue to develop our ability to analyse and communicate the drivers of physical and monetary value by service. In doing so, we will be able to better inform environmental policy experts and those undertaking appraisals on how changes in policy are reflected in natural capital asset values.

5 . Our work plans

Achieving these future developments will require developing the natural capital accounts, including:

- estimating and monitoring more ecosystem services
- adapting existing metrics to better interact with the national accounts
- increasing spatial granularity
- modelling functional relationships
- System for Economic-Environmental Accounting (SEEA) updates

More ecosystem services

Measuring and monitoring all of the benefits of nature is potentially an infinite task. We cannot yet fully model the removal of pollution in rivers by vegetation, and we are unlikely to gather sufficient data on the amount of mushrooms gathered from nature to eat at home. Expansion and improvement of the range of ecosystem goods and services captured is likely to remain a task for the managers of the natural capital accounts in perpetuity.

Beyond Dasgupta

The Dasgupta Review made the case for inclusive wealth accounts.

The natural capital accounts take us a long way towards this, but some adaptations are required to incorporate them in inclusive wealth measures. Estimates of physical degradation are among them, as follows. This work would also involve the development of input-output and supply-use tables also indicated by the SEEA Ecosystem Accounting (EA) methods.

The SEEA EA have been developed as a satellite account to the global System of National Accounting (SNA). The SNA has a strict "production boundary", which excludes many of the services and goods valued in the natural capital accounts, and in some circumstances values the same asset in very different ways. While SEEA EA is helpful, it was not designed to support the extension of the traditional production boundary to capture the environment. Our natural capital accounts statistics would form part of the work needed to expand the traditional production boundary.

There is some guidance on linking to the SNA in the SEEA EA, but this is not comprehensive. We will carry out some experimental work to adapt our figures to attempt to estimate inclusive wealth, and integrate nature with gross domestic product (GDP).

Physical degradation estimates

A fall in the value of an asset does not necessarily reflect degradation of the capacity of that asset to produce the good or service. For instance, if no oil is removed from the ground but the price goes down then the asset value will fall but the asset has not been degraded in function. It is equally possible to degrade an asset while prices are increasing and see the asset value increase overall. Currently the natural capital accounts do not reflect that difference.

We will work to develop degradation accounts to enable us to include them in wider inclusive wealth accounts. Reflecting such changes for a renewable asset is challenging and may not be possible comprehensively. The intent is therefore to develop quantitative degradation accounts as far as possible and explore the possible usefulness of a qualitative approach.

Supply-use tables

Supply-use tables (SUTs) map the way goods and services move through and between sectors in the economy.

The SEEA EA provides guidance for developing a limited supply-use table, similar to those using in the SNA but using ecosystem accounts data. This splits up the goods and services produced in a given year into which assets (habitats) they arise from.

We aim to be more ambitious and look at how our figures would fit into the official national SUTs. Instead of reframing our statistics, this would enable us to contextualise them. For instance, some commentators observe that the UK natural capital asset value seems to be relatively low. In part this is because we are looking at wholesale prices, at the very start of the supply chain.

An integrated supply-use table will enable us to look back along the supply chain at how much value is supported by UK natural capital. In addition, we might also be able to at least partially map the movement of foreign natural capital from other countries into the UK and through the economy.

Non-natural negative externalities

The natural capital accounts do not fully account for the damage caused by pollution. The primary impact of air pollution is on the health of people, emitted by people. As such it sits outside of the bounds of the natural capital accounts.

The Dasgupta Review recommends netting off the costs of such pollution from the industries causing them. In order to produce inclusive wealth accounts, we will need to support the creation of annual costs of air pollution linked to producers.

This work will also include estimates of the cost of emissions from climate change, which would have to be priced on the basis of impact. A team will therefore also develop methods for monitoring the net costs of climate change.

Greater spatial granularity

We have seen significant interest in data for small areas. Improving the spatial granularity of our estimates has a number of benefits, which help to meet the purposes of natural capital accounts.

Local-level breakdowns of such statistics will help to inform government, local authorities, businesses, NGOs and the public. Spatial granularity also adds explanatory data. For instance, if we know where timber forests are, we can link to other spatial data such as weather. Once we link a forest to its historical weather we could use that to partially explain variations in timber yields.

Improving spatial granularity will be an important area for development. We will produce local government-level outputs by default wherever possible and other geographies such as the Nomenclature of Territorial Units for Statistics (NUTS) if demanded. These improvements will be achieved using new data such as those produced by the Department for Environment, Food and Rural Affairs (Defra)'s Natural Capital and Ecosystem Assessment Programme or by altering our methods to enable better use of existing data. Given the scale of this work, this will be published as data only alongside standard outputs rather than detailed analysis. However, we will also produce some one-off outputs at a variety of spatial scales where this is of interest.

Opportunities to increase granularity vary across the accounts, with some services already able to be disaggregated to quite low levels, and others being much more challenging. Our intention is to develop all feasible routes to produce data with the greatest spatial granularity practicable.

Functional relationships and better projections

The theory underpinning natural capital accounts is that the extent and condition of natural assets drive the natural production of goods and services. For instance, one hectare of high-quality forest will produce more timber in less time than one hectare of poor-quality forest. If that same forest produces large numbers of bluebells in the spring it is likely to be visited by more people than a forest without bluebells.

In statistical terms, we can observe the amount of timber produced or number of visits people make to the outdoors more easily than we can observe the condition of those habitats. More importantly even if we could observe the condition of those habitats, we often do not fully understand the functional relationship between condition and production.

Not being able to tie changes in production to changes in natural assets has three impacts on the accounts:

- it is harder to accurately project how management will affect production into the future; asset value calculations rely on the projection of goods and services into the future and less accurate projection leads to less accurate asset values

- not understanding the relationship between changes in the natural world and ecosystem service projection reduces the analytical value of the accounts; improvements in understanding of those drivers allows us to answer important policy questions such as: "What actions are likely to improve the value of our natural capital"?

- in order to produce inclusive wealth accounts, we need to estimate the degradation of an asset separately to changes in price; observing the value of goods and services produced is not sufficient as we need to accurately predict whether we are reducing or increasing the capacity of that habitat to produce those goods or services

The accounts therefore need to continue to seek opportunities to better observe and understand the relationships between the extent and condition of a habitat on its ability to provide humanity with goods and services. This will be achieved by either statistical analysis of our own outputs such as recreation or by building models and methods to directly observe these drivers such as pollinator impacts on food production.

SEEA EA method changes

The landmark methodological updates to the international guidance in 2021 will underpin global production of aligned accounts. Our accounts are already broadly aligned with these methods, with some additional work needed.

A principles article for prioritising moves from existing methods to alignment will be produced by early 2023 outlining how we will update our accounts to remain in alignment with the SEEA EA method updates.

6 . What we will deliver

We will continue to produce the physical and monetary UK natural capital accounts every year, as well as two or three habitat accounts.

We will also produce two or three methodological articles every year, outlining significant advances in the core accounts, as we have done for saltmarsh flood risk, and recreation and health in 2022.

We will also produce at least one analytical bulletin each year on the statistical framework to help the policymakers and/or the public to better understand an interesting aspect of the accounts. These articles will include degradation estimate methods. This will be in addition to accounts that we will produce for devolved nations where they commission them.

In addition to core outputs, we will produce the following.

In 2022

- An updated principles article: reflecting changes in SEEA EA method guidance.

- Experimental extended supply-use tables: including a note on the significant caveats related to the initial draft tables and potential options to improve this work.

In 2023

- Degradation bulletin and methods article explaining the potential for the production of degradation accounts.

- Climate costs: an initial article describing how climate change-related costs will be estimated, which will enable the production of inclusive wealth accounts.

In 2024

- Climate cost estimates: for a limited set of impacts.
- Air pollution cost estimates: first estimates of the costs related to the economic sectors producing these.
- Improvements to extended supply and use tables.
- Interim roadmap updating timelines and strategy.

In 2025

- Updated climate costs article adding further areas of impact and statistical links to climate change.
- Water pollution cost estimates: first estimates of the costs of water pollution linked to the economic sectors producing these.

In 2026

- A wider range of climate-related costs and update on calculating the net impact of climate change on those costs.
- An interim roadmap updating timelines and strategy.

7 . Related links

New Beyond GDP measures for the UK: a workplan for measuring inclusive income
Article | Released 12 May 2022
Planned work, as well as timeline estimates, for projects feeding into a new a measure of “inclusive income”, aligned with the concept of “inclusive wealth”.

UK Natural Capital: interim review and revised 2020 roadmap
Methodology | Released 12 July 2018
This review and revised roadmap offers an introduction to natural capital accounting in the UK, assesses achievements in the three years since the last review, outlines various challenges and sets out priorities for the next and final phase of the roadmap.

UK natural capital accounts: 2021
Bulletin | Released 12 November 2021
Estimates of the financial and societal value of natural resources to people in the UK.

Habitat extent and condition, natural capital, UK: 2022
Bulletin | Released 3 May 2022
The size of area and condition indicators for eight natural UK habitats, including woodland, enclosed farmland, semi-natural grasslands and coastal margins. Uses the System of Environmental-Economic Accounting framework for Ecosystem Accounting. Experimental estimates.

8 . Cite this article

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