



# **Monetary Natural Capital Assessment in the Private Sector**

**A review of current status and research needs**

**Valuing Nature | Natural Capital Synthesis Report**

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## Abstract

Businesses have numerous impacts and dependencies upon natural capital which are not captured in normal financial accounting. Ascribing monetary value to natural capital increases its visibility and could therefore promote sustainable practices, and this approach has begun to gain popularity in the private sector.

Here we review 42 case studies of pioneer businesses who have publicly shared their experiences of natural capital assessment. We find that business motivations include the desire to identify natural capital risks, the reputational benefits of adopting innovative sustainability approaches, and the synergies between natural capital assessment and larger sustainability goals. Challenges encountered by pioneer businesses include accessing sufficient high-resolution data, obtaining support for natural capital assessment as a decision-making rather than just a reporting tool, and the uncertainty associated with assessment methods which are still maturing.

Carrying out natural capital assessment has already benefited business reputations; however, there is more limited evidence of benefits for natural capital *over and above* those which would have resulted from the tools already used by businesses with a history of sustainability engagement. These case studies suggest that key research needs include improving the datasets and methods available to support natural capital assessment, and investigating the extent to which monetary assessment translates into positive outcomes for natural capital.

# Key Messages

- **Private sector engagement is crucial to conserving and enhancing global natural capital.**
- **An increasing number of businesses are publicly sharing natural capital assessments.**
- **Most pioneer businesses are large multinationals with histories of sustainability engagement.**
- **Research is needed which supports uptake of natural capital assessment by improving the data and methods available.**
- **An additional research priority is to investigate whether natural capital assessment results in positive outcomes for natural capital.**

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## Introduction

Natural capital is critical to human wellbeing but is being depleted at an unprecedented rate. Private sector organisations depend upon natural capital inputs and also impact natural capital through their activities, and thus have great potential to improve the sustainability of natural capital use.

Much natural capital is freely available, and businesses impacts and dependencies on natural capital are therefore not captured in financial accounts. Valuing natural capital in monetary terms makes the invisible visible, and therefore theoretically motivates more sustainable practices.

Monetary valuation of natural capital has only recently begun to gain momentum in the private sector. Since the publication of the first Environmental Profit and Loss (EP&L) account by PUMA in 2011, a small but growing number of businesses have begun experimenting with natural capital assessment. The publication in 2016 of the Natural Capital Protocol<sup>1</sup> (a standardised framework for corporate natural capital assessment) hints that this approach is becoming increasingly mainstream in corporate sustainability thinking.

This report was produced in recognition of this trend. It aims to provide an accessible overview of the current status of private sector natural capital assessment, and to identify key needs for research in this rapidly evolving area.



## Box 1: Natural Capital and Natural Capital Assessment

### Natural capital

is defined as ‘the world’s stocks of natural assets, which include geology, soil, air, water and all living things.’<sup>2</sup> These assets provide numerous services critical to human well-being, such as climate regulation and food provision, but are becoming dangerously degraded by human activity.

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### Natural capital assessment

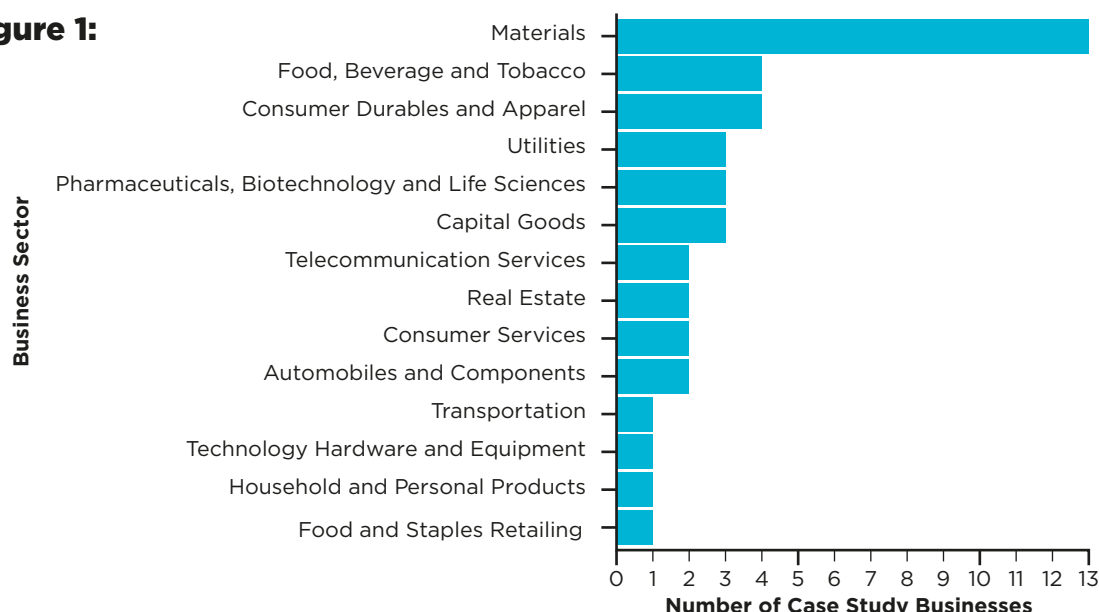
is the process of valuing impacts and dependencies upon natural capital in order to better integrate natural capital into decision-making and so improve natural capital management. Natural capital assessments have been carried out at global<sup>3,4</sup> and national<sup>5,6</sup> scales, but have only comparatively recently attracted interest from private sector organisations. Natural capital assessment can be carried out using both quantitative and qualitative valuation methods<sup>7</sup>; however, our primary interest is in businesses attempting to value natural capital in monetary terms.

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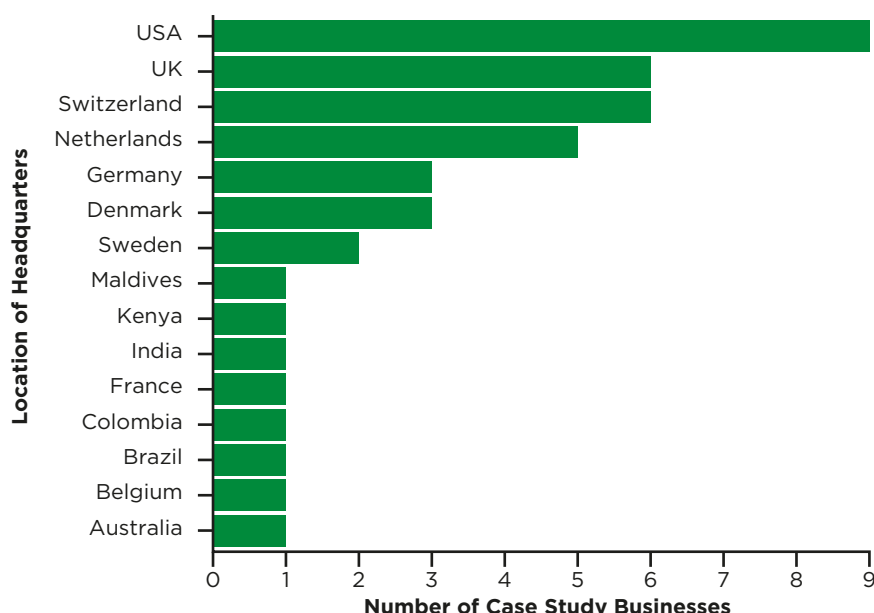
## Which businesses have publicly documented natural capital accounting?

A review of academic and grey literature identified 42 case studies of businesses or business groups who have publicly shared natural capital assessments and who have attempted to value at least some of their impacts or dependencies in monetary terms. This should not be considered a complete list as there are additional studies not in the public domain, but these examples can provide valuable insight into the experiences of early adopting businesses.

**Figure 1:**



**Figure 2:**



**Figure 1:** The Materials, Food and Apparel industries contributed the greatest number of case studies (industry definitions based on GICS®). Chemical companies were particularly well represented, accounting for 10 of the 42 case study companies.

**Figure 2:** 84% of case studies were based on companies headquartered in either the USA or Europe. 80% of case study companies were multinational or transnational corporations. Almost all case studies were derived from larger companies, with only two represented companies classed as small to medium enterprises (SMEs).

## The Natural Capital Protocol and the stages of natural capital assessment

The Natural Capital Protocol identifies four main stages of natural capital assessment: **(1) frame** (why the assessment should be carried out); **(2) scope** (identifying the objective and appropriate scope of the assessment, and the impacts and/or dependencies which should be included); **(3) measure and value**; and **(4) apply** (interpret the results and take action). We therefore structure this report based upon the different sections of the framework.

# Framing the assessment:

## why did early-adopting businesses choose to assess natural capital?

### To inform decision-making and identify risks

A number of businesses including Yorkshire Water, Dutch Railways and Roche used natural capital assessment **to improve the targeting of sustainability interventions**, identifying the types of impact and areas of the value chain most in need of improvement. Natural capital assessment has also been used to justify existing strategy: Interface Global, for example, used monetary assessment to validate their focus on reducing greenhouse gas emissions.

Natural capital assessment has also been used **as a comparative tool** based on the conversion of diverse value types to comparable monetary units. This approach was used by Natura to assess the environmental value of different agricultural systems in Brazil, and by Yorkshire Water to assess future land use options at a landfill site in the UK.

Monetary assessment has also enabled companies **to identify natural capital risks**. Natural capital costs are currently ‘external’ to businesses, but may increasingly become internalised in the future. The means by which costs could be internalised vary by sector and by natural capital type: Nespresso, for example, were interested in understanding vulnerability in coffee supply chains due to climate change, whereas Cemento Argos, Hammerson, Robert McAlpine and PUMA all highlighted increased environmental regulation as the anticipated mode of internalisation.

### To enhance communication and company reputation

**Monetary valuation is seen as means of enhancing sustainability communication, both internally and externally.** PUMA described how scientific metrics such as carbon dioxide equivalents can be difficult to interpret for those not familiar with sustainability research, and both BASF and Kering describe monetary valuation as ‘a language business understands.’ This is suggested to help increase internal support for sustainability improvements, and was also cited in multiple case studies (e.g. The Coca Cola Company, Roche, Safaricom and Yarra Valley Water) as being useful for engaging with company stakeholders, investors and consumers.

**There are also perceived reputational benefits to publicly releasing a monetary natural capital assessment.** However, in many cases this reputational benefit was partly associated with narratives of innovation. The terms ‘pioneering’ and ‘ground-breaking’ were used regularly in case study materials, positioning early-adopting companies as leaders in a new movement, and releasing a natural capital assessment was characterised as an act of bravery – Nespresso are described as ‘bold’ and Dutch Railways as ‘showing courage.’ This raises questions as to whether reputational benefits – and therefore the appeal of monetary assessment – will persist if monetary valuation approaches become more common.

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## As part of a broader sustainability vision

The majority of case study businesses have strong pre-existing engagement with sustainability. Many had previously investigated impacts on natural capital, if not in monetary terms, and viewed natural capital assessment as complementary to existing approaches. AkzoNobel, for example, described monetary assessment as part of an ‘on-going sustainability journey’ which has broadened gradually from an initial focus on greenhouse gas emissions, while the Crown Estate and Hugo Boss appear to have integrated monetary valuation into existing environmental impact strategies. Case study businesses also placed emphasis in their annual reporting on larger sustainability initiatives, such as Integrated Reporting, the Circular Economy, and the UN Sustainable Development Goals. **This suggests that monetary natural capital valuation is becoming part of the larger toolkit used by businesses with strong understanding of corporate sustainability.**

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## Scope and measure: what have pioneer businesses included in their assessments?

Case study businesses varied substantially in their choice of scope. The chosen focus of the assessment varied from a single product, such as AkzoNobel assessing the natural capital impacts of a book, up to an assessment of the whole Danish Apparel Sector. Most common was to adopt a business-wide approach, as characterised in the Kering and Arla Foods EP&Ls, or to carry out a pilot study upon a subset of products or sites, as chosen by Roche in focusing only upon locations in Switzerland.

Greenhouse gases were the most common impact to be included in natural capital assessments (Table 1), and were also in many cases the biggest natural capital costs. Many more case studies reported impacts than dependencies, perhaps reflecting the evolution of natural capital assessment from the original EP&L approach to the current Natural Capital Protocol. Reported dependencies included mineral and energy extraction, flood protection, knowledge creation, and spiritual values. Many businesses also included positive natural capital impacts, such as improved carbon sequestration and soil quality.

A technical critique of natural capital valuation methods is beyond the scope of this report, but detailed overviews are available elsewhere.<sup>9</sup>

**Table 1:** Most commonly included impacts and dependencies in the 33 case studies providing full details of assessment methods.

Impact/Dependency	Number of Case studies
Greenhouse Gases	31
Water Use	26
Air Pollution	21
Water Pollution	20
Land Occupation and Land Use Change	13
Solid Waste	12
Land Pollution	6
Biodiversity	6
Human Toxicity	6

## What barriers were encountered by pioneer businesses in the ‘scope’ and ‘measure’ stages?

**Data availability** was the most commonly reported constraint on monetary assessment, with businesses reporting scaling down assessments or excluding potentially material impacts due to limited data availability.

**Maturity of methods** was also a significant issue. The novelty of monetary natural capital valuation methods has reputational benefits, but is also associated with higher uncertainty

which can undermine perceived credibility and which has in some cases resulted in **lack of internal support for natural capital assessment**. Data demands and technical complexity also mean that **a full natural capital assessment requires substantial resources** – Novo Nordisk suggest that carrying out a comprehensive EP&L takes between 12 and 18 months.

These capacity gaps, while challenging, are not insurmountable. In some cases businesses have used initial pilots to identify and address data needs – Nespresso, for example, altered their farm level data collection strategy following a natural capital assessment trial in Colombia. Many more businesses have adopted partnership working models, either with consultancies such as Trucost and KPMG, or with NGOs and academic institutions. There is thus great potential for researchers to collaborate with private sector organisations to identify and collect appropriate data and to improve the rigour and consistency of natural capital assessment methods.

A number of businesses have also developed approaches to enhance internal support for natural capital assessment, primarily highlighting the importance of cross-departmental communication and higher level support. The Crown Estate, for example, describe how internal engagement work has been key to transforming perception of their ‘Total Contribution’ approach from being a reporting tool to a decision-making tool, while Skanska stress the importance of fostering collaboration between sustainability professionals and other business departments to enable the uptake of natural capital concepts. Jaguar Land Rover identify language choice as important in internal communications, arguing that natural capital terminology should be only gradually integrated into internal business conversations. The importance of support from higher level management was also demonstrated or commented upon in a number of case studies, such as those from PUMA, AkzoNobel and Tata. A more detailed investigation into the strengths and weaknesses of different communication models, and the extent to which these are transferable to other organisations, would be very timely as more businesses begin to engage with natural capital assessment.



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# Applying the assessment:

## is adoption of monetary natural capital accounting associated with positive outcomes...

### ...for business?

Case study businesses have reported a number of beneficial impacts from monetary natural capital accounting, particularly in terms of **communication, collaboration and stakeholder engagement**. Skanska described the value of the assessment for promoting communication between teams who did not normally collaborate, while Dow Chemical found that the assessment engaged with stakeholders and employees at all levels of the company. Several businesses including PUMA and Roche have also directly acknowledged the reputational benefits derived from publicly sharing monetary assessments.

Some companies have also begun to integrate the findings from natural capital assessment **into decision making and risk identification**. PUMA found that the EP&L supported improved targeting of the sustainability strategy by identifying the areas of the supply chain with the greatest natural capital impacts, while Novartis found that the assessment helped motivate behaviour change in other parts of the company and Solvay found that the results of the assessment helped them advocate for the development of more sustainable products.

Early trials have also been invaluable for improving **natural capital assessment methodologies**. Many case studies acknowledged that natural capital assessment and particularly the calculation of monetary values for natural capital is still in a testing phase. Businesses such as the Crown Estate, LafargeHolcim and BASF therefore stress the importance of sharing experiences and methods for natural capital assessment in order to progress towards more standardised, widely recognised approaches. From this perspective it would be valuable to increase the diversity of businesses covered by publicly available pilot studies. The case studies informing this report are primarily from large US and European multinationals and are dominated by businesses in the materials industry group, and expanding available literature to give a more balanced representation of different industries and geographic contexts would allow easier identification of sector- and location-specific capacity limitations and data needs.

## ...for natural capital?

The evidence as to whether monetary natural capital assessment is having positive impacts on natural capital is less clear. There are a number of reasons for this. Firstly, **at present monetary assessment has been carried out mainly by businesses with pre-existing sustainability programmes.** This means that firstly it is difficult to disentangle which improvements have been obtained due to monetary assessment, and secondly that the overall benefit derived from using monetary assessment may be lower in businesses which are already observing good practice.

The second reason is that **monetary natural capital assessment by business is still at a very early stage.** The Natural Capital Protocol was only published in 2016 and many businesses are still trialling new methods, so changes in approach may not yet have filtered through to changes in decision-making.

**Businesses also argue that they are constrained in their ability to reduce natural capital impacts,** even with access to the improved information derived from natural capital assessment. PUMA suggest that 85% of their environmental impacts were in areas of the supply chain where they had limited control, while Hammerson and Robert McAlpine highlight the difficulty of influencing customer behaviour during the product use phase. However, other case study companies have begun to take steps to address both upstream and downstream supply chain impacts. The Crown Estate have begun to pilot natural capital valuation with tenant farmers and businesses on their estates<sup>10</sup>, Nestle are trialling a natural capital premium for dairy farmers<sup>11</sup>, and larger scale industry initiatives such as the Better Cotton Initiative<sup>12</sup> aim to promote both environmental and social sustainability. It is therefore apparent that private sector organisations can drive sustainability improvements – but there is limited empirical evidence that monetary natural capital assessment has so far motivated these kinds of real-world actions.

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# What research is needed to support the uptake and impact of natural capital assessment?

From the review of case studies provided above, we identify the following priorities for research on natural capital assessment.

- 1. Innovation and motivation:** many of the reputational benefits of natural capital assessment lie in its novelty, and we suggest a need to investigate the consequences of this for the longer term viability of natural capital assessment in sustainability strategies.
- 2. Data and methods:** while natural capital assessment methods are progressing rapidly, there is still a demand for improved data availability and more consistent methodological approaches in corporate natural capital assessment. Partnerships between research organisations and the private sector represent one method of addressing the capacity gaps faced by early-adopting businesses and particularly by less well-resourced SMEs.
- 3. Models of internal and external communication:** buy-in from internal and external stakeholders and higher-level management is key to converting natural capital assessment from a reporting to a decision-making tool. Investigating the successes and failures of the communication models used by early-adopting businesses would be valuable to inform the strategies of subsequent adopters.
- 4. Improving the case study literature:** existing publicly available case study literature is skewed towards multinationals and towards particular geographic locations and industry sectors. Expanding this evidence base would allow improved tailoring of natural capital assessment approaches, and would also provide models which could motivate uptake by a greater range of businesses.
- 5. Reaching beyond businesses with prior sustainability engagement:** the case study businesses covered in this report have built upon long histories of sustainability engagement – this means that they have greater capacity and willingness to engage in natural capital assessment, but that the sustainability gains to be made are perhaps less profound. It is therefore important to investigate whether natural capital assessment can also have value to those businesses which heavily impact natural capital and which have not engaged with previous sustainability initiatives.
- 6. Natural capital impact:** in order to advocate for greater uptake of natural capital assessment, a clearer evidence base is needed showing positive outcomes for natural capital *over and above* those which would have been achieved by existing corporate sustainability tools. This will be challenging to establish, but is critical to evaluating the validity of natural capital assessment as a sustainability approach.

# With thanks

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## References

- 1 <https://naturalcapitalcoalition.org/protocol>
- 2 <https://naturalcapitalforum.com/about>
- 3 Millennium Ecosystem Assessment (2005) Island Press, Washington DC
- 4 Costanza et al. (1997) *Nature* 387: 253–260
- 5 <https://www.wavespartnership.org>
- 6 Watson et al. (2011) UK National Ecosystem Assessment.
- 7 Bullock (2017) NESC Research Series Paper 10.  
Available at [http://edepositireland.ie/bitstream/handle/2262/82055/Research\\_Series\\_Paper\\_10\\_CBullock\\_NaturesValue.pdf?sequence=1&isAllowed=y](http://edepositireland.ie/bitstream/handle/2262/82055/Research_Series_Paper_10_CBullock_NaturesValue.pdf?sequence=1&isAllowed=y)
- 8 Global Industry Classification Scheme.  
Available at <https://www.msci.com/gics>.
- 9 Modée & Werner (2014) World Environment Centre.  
Available at <http://www.wec.org/2014naturalcapitalvaluation>
- 10 <http://www.crownstatescotland.com/media-and-notices/news-media-releases-opinion/scottish-farmers-to-trial-valuing-nature>
- 11 CISL (2018) Cambridge, UK.  
Available at <https://www.cisl.cam.ac.uk/publications/publication-pdfs/modelling-better-business-case-study-feb-2018.pdf>
- 12 <https://bettercotton.org>

A full list of the case study literature used to inform this report can be found at: [http://valuing-nature.net/sites/default/files/documents/Synthesis\\_reports/PrivateSectorNC\\_CaseStudies.pdf](http://valuing-nature.net/sites/default/files/documents/Synthesis_reports/PrivateSectorNC_CaseStudies.pdf)



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