Improving nature's visibility in financial accounting

Full Report

April 2020

CAPITALS COALITION

This document has been prepared by a project team led by Economics for the Environment Consultancy Ltd (eftec) on behalf of the Capitals Coalition.

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Foreword

All organizations impact and depend on all kinds of capitals, including natural, human, social, and produced/financial capital.

Advanced businesses recognize that thinking about their resources and relationships in terms of capital can bring significant advantage. There are thousands of companies around the world completing capitals assessments but there is not yet a standardized way to include assessment outputs in accounts.

The International Integrated Reporting Framework sets out the argument for integrated disclosure, and now a range of organizations are developing approaches showing how accounts could evolve to include this essential information.

As with all the projects run through the Capitals Coalition, collaboration is key. The idea to develop this project came from the community of practitioners who were already looking at ways of adjusting financial accounts to make natural capital more visible in disclosures. This work has been supported by a wide range of people from different backgrounds, recognizing that to change systems we need all stakeholders to be involved. The Coalition recognizes that 'value' can be expressed in qualified and quantified as well as monetary terms, and as such is also continuing to explore other alternative approaches that fall outside of the scope of this particular work.

We launch this report in the spirit of open enquiry, of identifying issues and raising questions rather than providing complete answers. We hope that it will be of broad appeal and will act as an invitation to engage. We invite you to join this effort, support the capitals movement, and contribute to the discussion around harmonizing capital approaches, to improve all of our decision making by explicitly valuing the resources and relationships upon which we depend.

Mark Gough, Chief Executive Officer, Capitals Coalition

Richard Spencer, Director of Technical Thought Leadership, Institute of Chartered Accountants of England and Wales

Technical Summary

As a growing number of organizations identify and assess their impacts and dependencies on natural capital, they also seek ways to use and report the results. Given that financial accounting is a key decision-making tool, linking natural capital data with financial accounts is an obvious route to examine. This report presents methods to address the questions of *how can financial accounts be adjusted to make natural capital more visible to decision makers and/or in disclosures*?

The report is based on the contributions of many experts from across disciplines who came together in a collaborative process hosted by the Capitals Coalition (formerly the Natural Capital Coalition). The goal of the project was to illustrate innovative approaches that organizations use to integrate the value of nature into their financial accounts. This report seeks to begin a process by identifying solutions, exploring their synergies, and highlighting how they fit into the current landscape of financial accounting.

This report provides an overview of four innovative approaches and identifies potential future routes and collaborations to mainstream solutions. The four methods explored all show how parts of financial accounts, such as an income or balance sheet, can be altered to include figures that reflect natural capital impacts and/or dependencies. The methods presented are neither comprehensive nor complete, but they are all illustrated through real-world examples, showing that action can be taken. They help companies to understand and visualize how they can integrate natural capital within their income statement and/or balance sheet, and what impact this could have. The specific methods differ in their approaches, providing different routes to make natural capital visible within different aspects of financial accounts:

- **Method 1 – Integrating Natural Capital Accounting practices into Financial Accounting of Intangible Assets**: Treating some investments to enhance natural and human capital as an “intangible asset” under existing accounting standards (International Accounting Standard 38).
- **Method 2 –Value Added Statement for Nature**: Reshaping the income statement to show how much of the value generated by companies is “given back” to nature.
- **Method 3 – Comprehensive Accounting with Respect to Ecology (CARE) Model**: Including new types of liabilities and assets that reflect debts to (as a result of inputs from) natural and social capital.
- **Method 4 – Integrating Natural Capital into Financial Accounting**: Illustrating integration of financial and natural capital into a single income statement and balance sheet.

Like all financial accounting approaches, each of these methods has advantages and disadvantages, but all result in an adjustment to a financial account, illustrated with real data in this report. The discussion of methods and adjustments used is focused on natural capital. However, the methods are considered to be largely applicable to other forms of capital, such as human or social capital, which suffer from the same invisibility as natural capital.

Going forward, there is much more work to do to integrate natural capital into financial accounting.

Further guidance and standards are needed if methods are to be used at a larger scale across business. While related guidance on how companies can measure and value their impacts and dependencies is growing (such as ISO standards ISO 14008: monetary valuation and ISO 14007: using monetary valuation evidence), further guidance is needed on how companies can integrate separate natural capital and financial reporting systems, illustrated by specific examples showing the practicality of methods and the materiality of the data for decision making.

The integration of natural capital in financial reporting will require continued collaboration between leading initiatives to ensure a common approach and understanding for natural capital accounting, and further inputs from businesses to ensure pragmatic uptake and implementation. A common approach does not require harmonization to a single method but does require common principles and rules to ensure the advantages of accounting: the comparability of results across space and time combined with the insights from measuring and valuing natural capital.

We hope that practitioners from across the economy who use differing tools and approaches will benefit from this document by having a comparator for their work, and an input to their thinking.

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1. Why is this needed?

Organizations depend on and impact capitals

Organizations cannot produce goods and services without nature, people, social networks, and shared norms and values. All companies depend upon natural, human, social, and produced capital to operate, directly or indirectly through their value chain supply or relationships. They cannot succeed without natural capital such as land, raw materials, ecosystem services, energy; human capital such as workforce, knowledge, skills; social capital and structures; and produced capital such as equipment and financial resources. These capitals (defined in Box 1) are all interconnected and are, ultimately, underpinned by natural capital.

Organizations also impact and change capitals as a consequence of their operations. Capitals may be degraded and depleted or restored and regenerated, with each change impacting other forms of capitals. All impacts on capitals have consequences, both to business and to society. These consequences are expressed as costs or benefits to both. For example, some businesses include increases in costs from material scarcity or reduction in productivity from low safety standards.

Box 1. Types and definition of capitals

Although many things can be considered as a capital stock there are four that are commonly used and stand out:

- **Natural Capital**: Stock of renewable and non-renewable natural resources, (e.g. plants, animals, air water, soils, minerals) that combine to yield a flow of benefits to people.
- **Social Capital**: Networks together with shared norms, values and understanding that facilitate cooperation within and among groups.
- **Human Capital**: Knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being.
- **Produced / Financial Capital**: All man-made assets, such as buildings, factories, machinery, physical infrastructure (roads, water systems), intellectual property, as well as all financial assets.

Organizations need good information systems to manage risks and opportunities

Dependencies on, and impacts to, capitals affect business performance. Organizations should address related risks and opportunities to manage potential effects to their bottom line. The nature of risks and opportunities varies, from those directly driven by changes in the availability and quality of capitals (also called operational or physical) to those driven by different stakeholders with different perspectives (also called transitional). The transitional category includes risks and opportunities driven by: (i) investors, although they require a return on investment, can drive the (access or) cost of capital based on their interest in wider impacts or respond to societal expectations to act in the interest of those experiencing wider impacts; (ii) society in general, as business exists to meet people's needs they are exposed to a growing number of better-informed stakeholders such as customers and employees; and (iii) policy makers, who can change regulatory frameworks to protect nature and society and so affect business performance.

Most companies have information and accounting systems in place to track their relationship with financial and produced capital. They have some, although still limited, information about the values of their relationship with natural and human capital, and almost no information about their relationship with social capital. Business information systems record financial values of traded goods and services, wages to employees, and some intangibles such as brand value because they are a result of financial transactions. However, many other

connections with capitals, such as dependencies on ecosystem services, need of knowledge and skills, or consumer trust, are missing.

Accounting for only what happens inside the borders of a business provides a narrowed view to business managers and shareholders. This could threaten long-term viability and investors' returns. Better understanding and tracking business impacts and dependencies on all capitals allows better management and decision-making processes intended to reduce business risks and enhance opportunities. Only with more complete and relevant meaningful information on the relationships between all capitals can businesses reach decisions to effectively manage risks and opportunities, as well as inform stakeholders about them.

Progress on integrated capitals assessment to improve decision making

The Natural Capital Protocol and the Social & Human Capital Protocol are two frameworks that are helping businesses to better identify, measure, and value business relationships with these capitals. The way in which businesses are including this information in their systems and processes varies largely across businesses, following a progression entailing the following stages, summarized in Figure 1:

i. **Internal decision making**: A better understanding of the value of impacts and dependencies on capitals is helping companies inform their internal decision making. Businesses at this stage conduct capital assessments and incorporate information into their own internal decision processes or tools.

ii. **Strategy**: More fully informed decisions enable businesses to (re)define their strategies by including other capitals besides financial and produced capital. Keeping track in a more systematic and concise way, by using different natural accounting frameworks, helps businesses assess progress against their strategies.

iii. **External disclosure**: Well-informed strategies enable engagement with stakeholders. This can be done more directly though financial accounts to provide investors, policy makers, and other stakeholders with a better picture of how capitals are strategically managed.

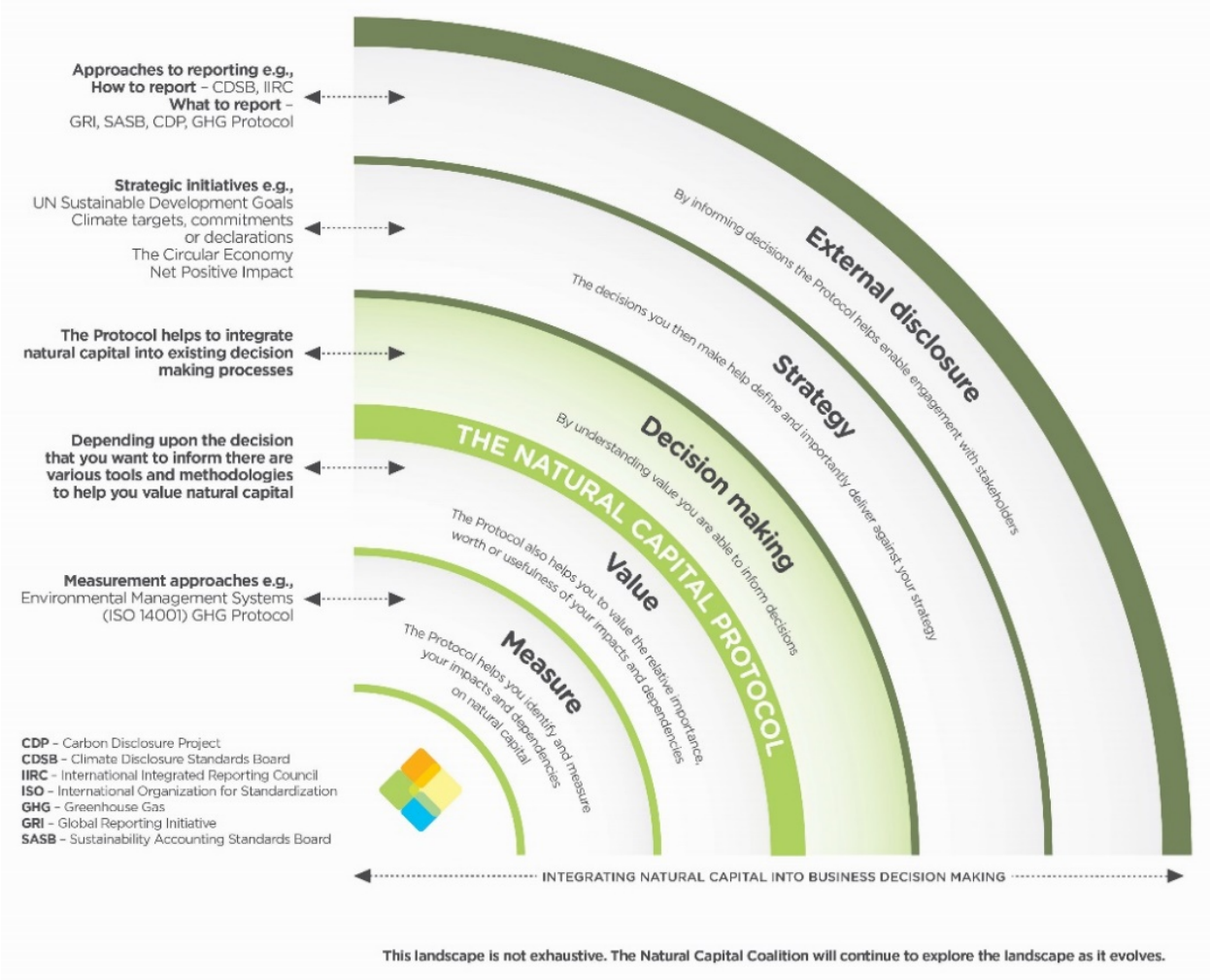


Figure 1: **Progression of stages in business integration of capitals for decision making and reporting (Source: Natural Capital Coalition, 2016)**

Business stakeholders drive the financial, regulatory, and societal context for business activities. Businesses already assessing capitals can better inform their stakeholders about how they manage and include capitals into their strategies. This also allows the business to integrate information from all capitals in a similar way and show how different capitals are relevant for long-term business viability.

There is growing international recognition that the Natural Capital Protocol and Social & Human Capital Protocol provide a standardized framework to help businesses assess, measure, and value their impacts and dependencies on capitals. However, there is not yet an obligation to record this in financial accounts nor report it externally in a standardized way. Nonetheless, frameworks and requirements are developing rapidly in line with global awareness of environmental damage and the flaws in accounting's current business as usual. Chapter 2 of this report reviews the landscape of existing accounting practices, both in the financial and natural capital domains, and explains how the innovative proposals presented in this report contribute to improve the current situation.

2. What is the role of accounting?

"Accounting is a way of recording, analyzing, and summarizing transactions of an entity."

Source: ICAEW (2016)

Accounting financial transactions

Accounting has largely evolved from the most basic forms of record keeping used since 8000 BC. Record keeping combined with calculations provide the basis for the internal reporting that management uses to run the business, which in turn often forms the basis of the information that a firm reports externally. Some of this external reporting will be public (ICAEW, 2017).

Managerial accounting experienced a great boost during the industrial revolution due to the growth in size and complexity of corporations. Managerial accounts support more effective decision taking, such as resources allocation, pricing and business performance management.

But, traditionally, discussions of accounting focus predominantly on external reporting, especially by listed companies. By doing so, the contribution of the different forms of accounting, such as managerial accounting, may be undervalued (ICAEW, 2017). Financial information produced by firms is used by investors in a similar way as managers but with a different perspective.

This report focuses on public reporting but recognizes that this is underpinned by the internal management accounts. Such accounting is prepared in a way to be useful to management to inform decision making. While financial accounts are built following different accounting rules and procedures for disclosure (different to the one for managerial accounts), there is certainly some alignment between the information needed for management and information needed for disclosure.

Accounting natural capital transactions

Entities are increasingly aware of the need to record, analyze and summarize their ´transactions´ with nature, people and society. These transactions, as in traditional economics, encompass the impacts and dependencies on natural, human and social capital. But, contrary to financial transactions, these generally lack a market price. Consequently, they can easily become 'invisible' to business decision makers and investors by not being captured by conventional accounting systems.

There is growing evidence of the influence of nature, people and societies on business performance. However only by measuring and accounting these other capital transactions can business and investors effectively take decisions to properly manage their natural, human and social risks - and opportunities.

A growing number of companies measure and value their impacts and dependencies on natural, human, and social capital. This information is used to inform internal decisions about how to manage natural, human, and social capital risks and opportunities. The Natural Capital Protocol and the Human & Social Capital Protocol provide standardized frameworks to identify, measure, and value natural, human, and social capital impacts and dependencies, resulting in a growing number of capital assessments. These assessments can be considered under managerial accounting practices as they support internal decision making.

In the case of natural capital, some businesses are starting to compile information about their natural capital impacts and dependencies in a more consistent and comparable way using natural capital accounting approaches (see Box 2). These approaches are resulting in an increasing number of procedures and individual

accounts through to reporting statements, such as the natural capital balance sheets (under the Corporate Natural Capital Accounting methodology, CNCA) and the income statement (under the Environmental Profit and Loss methodology, EP&L). Other methods follow similar procedures, but address valuation through a mix of monetary and quantitative approaches, such as the Triple Bottom Line (TBL). While there are growing cases of their application, comparability remains limited with no standardization of the methods (yet).

Box 2. Definitions of natural capital accounting and assessment

Natural Capital Accounting is the compilation of consistent and comparable produced data on natural capital and the flow of services generated, using an accounting approach to show the contribution of the environment to the economy or business and the impact of the economy or business on the environment.

Natural Capital Assessments use natural capital information to answer a specific question or inform a decision. The aim of an assessment is not to collect a set of indicators, or necessarily to produce accounts. Assessments often inform internal decisions rather than disclosure.

The Value Balancing Alliance, founded in 2019 by eight international companies and supported by Deloitte, EY, KPMG, PwC, and the OECD, aims to create a standardized model for measuring and disclosing the environmental, human, social, and financial value companies provide to society. The Value Balancing Alliance, the Capitals Coalition and the World Business Council for Sustainable Development, are leading a European Commission project to develop Environmental Generally Accepted Accounting Principles (E-GAAP). Standardization will help bring greater clarity to the various methods for non-financial accounting.

Linking different capitals through accounting

This report is intended to contribute to these initiatives by exploring innovative accounting approaches and advancing discussions around the integration of different capitals accounts into one statement. Until recently, progress in natural capital accounting has taken place in parallel to produced/financial capital accounting. As a result, accounts of different capitals are not integrated and remain as two distinct sets of information. Only some natural capital impacts and dependencies, such as those relating to marketed products and operational costs, are captured under current financial accounting standards. The lack of integration may be explained by:

- A focus on financial returns. Unless there is an impact to a company's financial performance and within the boundary of the business, accounting omits the value of impacts to society (so-called externalities) and the value of business non-marketed dependencies on nature, as well as the wider risks and opportunities from these (regulatory, reputational, financial, etc).
- A focus on the short term. Short-termism risks losing sight of (i.e., not attributing) many of the longer-term risks and opportunities that relate to nature such as climate change.
- A focus on certainty. Although the tough criteria in financial accounting standards are necessary to prevent under/overstatement, this means that elements of natural capital valuation with no market value can only be recognized at cost.

The lack of integration has resulted in financial accounting focusing on an incomplete picture of corporate performance (particularly financial returns) which only take into account the financial risks and opportunities that a business is aware of and can easily quantify. It leaves out natural capital-related financial returns of environmental services (e.g., clean water and fertile soil) and misrepresents the many risks and opportunities associated with natural capital impacts and dependencies.

Decisions cannot be made based on considerations of just one of the capitals (financial, natural, or other). Integrated systems will help to build integrated accounts that businesses can also use to inform their external stakeholders of their integrated capital strategies.

Four methods are explored in this report, each showing potential to further develop natural capital accounting practices and make the results of natural capital accounting visible within financial accounting practices. The four methods provide new ways to inform and expand on different aspects of current practices in financial and natural capital accounting.

- **Method 1: Integrating Natural Capital Accounting Practices into Financial Accounting of Intangible Assets** – Using this method companies can increase the visibility of spending on natural capital within the financial balance sheet using existing international financial accounting standards on intangible assets. This results in a new line item in the financial balance sheet.
- **Method 2: Value Added Statement for Nature** – This method extends the value-added format of the income statement to focus more specifically on a new provision for nature as an explicit form of capital. This gives explicit visibility to natural capital within the income statement, while remaining largely within current accounting standards.
- **Method 3: Comprehensive Accounting in Respect of Ecology (CARE) Model** – This method takes a step into the integrated reporting space and proposes a separate reporting statement that integrates natural, social, and produced/financial capital into an integrated balance sheet and income statement. Intentionally outside of the scope of existing standards, this method provides insight through showing these integrated accounts as a separate statement.
- **Method 4: Integrating Natural Capital into Financial Accounting** – The most speculative of the four methods, this reflects a scenario where financial and natural capital accounting practices are integrated. The method results in an entirely new integrated balance sheet and income statement, built on their financial counterparts.

All four methods aim to increase the visibility of natural capital within financial accounting and each method promotes integration of natural capital within the current modes of accounting and reporting. But they do this in different ways (see Figure 2). Methods 1 and 2 are designed within existing accounting standards, requiring mainly actions focused on engagement with key stakeholders and further piloting/application to prove their practicality. Methods 3 and 4 require broader changes in accounting standards and rules, and so may require more time and effort to mature.

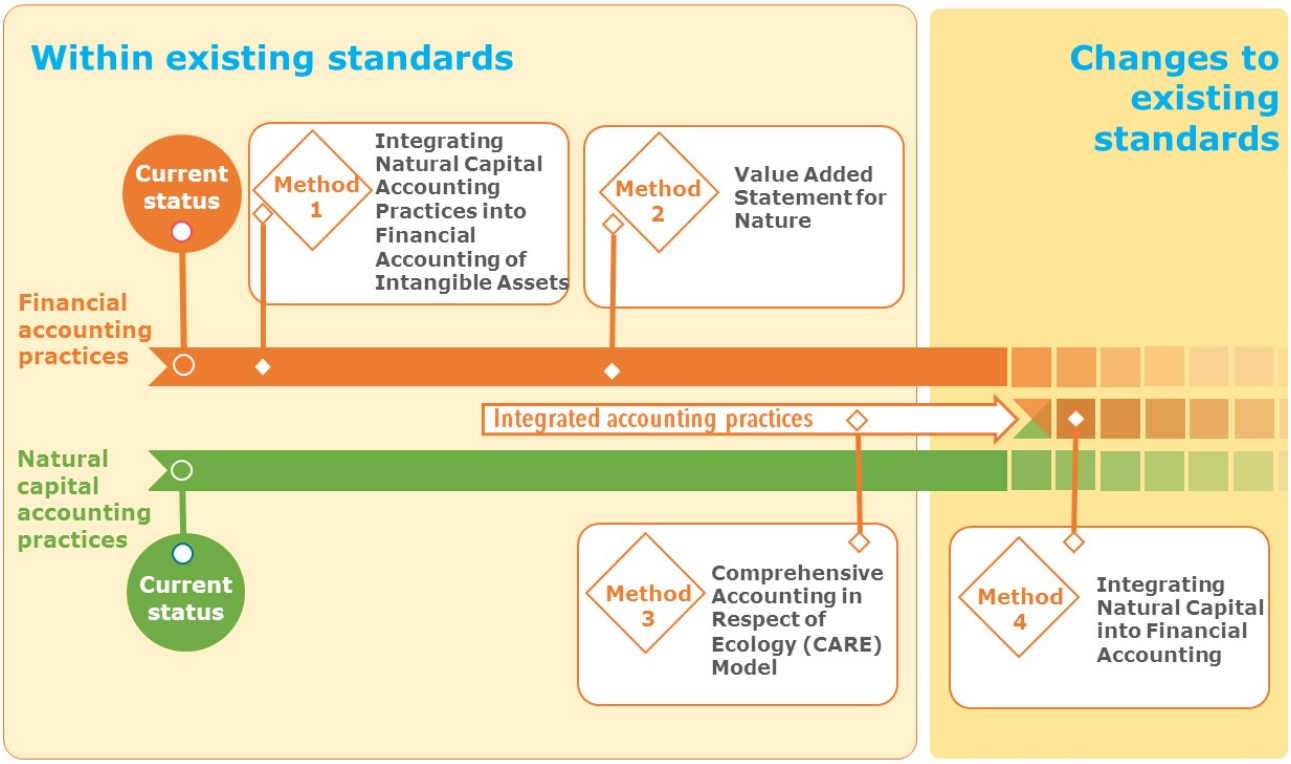


Figure 2: Relative position of project methods in the existing accounting landscape

3. How can we innovate?

The four methods presented here each target a different aspect of the changing landscape of financial and natural capital accounting in practice. The following subsections summarize each method and its application examples in this report across a series of questions. The output from each method is illustrated in an example account shown in Figures 3 through 6. Detailed reports of each method are provided in Annexes A through D.

3.1 Method 1: Integrating natural capital accounting practices into financial accounting of intangible assets

Description of the method

Authors: Adams Koshy and Ian Dickie

Description of method

This method focuses on how natural capital measurement could be (partially) integrated into financial accounts, based on current international accounting standards on intangible assets. The standard allows for capitalization of investments recognized as "intangible assets."

Four forms of investments into intangibles were identified for this project:

- Resource quotas
- Training costs to improve management of natural capital
- Development costs for natural capital solutions to land management
- Brand value related to sustainable management, practices, etc.

Does this relate to natural, human and/or social capital?

The primary focus is on natural capital, but investment in training also relates to human capital.

How does this increase visibility of natural capital?

The method increases visibility using current financial accounting standards (IAS 38) through recognition of an intangible asset in the financial balance sheet rather than traditionally treating it as an expense.

Link to financial accounting

How would this method be interpreted today under current accounting rules?

The four specific forms of spending can be classified as investments within the current IFRS – specifically IAS 38.

What gaps in the current financial accounting approach does this method work to address?

Although standards already exist, these investments are currently not being capitalized. The method outlines the conditions under which capitalization could be applied and seeks to highlight the limiting factors in the use of the current standards.

However, it is important that application of this approach does not allow management to anticipate the recognition of benefits in the financial statements (e.g., from choosing between alternative investment decision), which is often part of the normal course of business and would overstate any benefits.

What is innovative about the method?

The method looks at four specific forms of intangibles (under accounting standards) that could be applied by businesses today.

Case study

Which subject matter and data are used in the case study?

Case studies focus on training costs and development costs, with hypothetical but realistic data to show what a new asset line item in a balance sheet could look like.

- Location: Europe
- Sectors: Agriculture, forestry, water utilities
- Spatial scale: Project / Corporate
  Type of Data: Internal company data on expenditure

What are the results of the case study?

Case studies look at specific investment projects in the agriculture and water utility sectors relating to training costs and development costs (respectively). The cases illustrate the implications of considering these costs as investments for the balance sheet.

What is the final accounting result/output of the case study?

The balance sheet changes as a result of including the capitalized expense.

Other conclusions?

- The results depend on the accounting standards – for example, the US Financial Standards Board does not allow for capitalization.
- Capitalization helps companies meet the accounting principle of matching
- There are potential benefits of capitalization such as communicating with mainstream investors, as natural capital investments are given greater visibility
- Possible industry-specific guidance could be developed to inform key sectors that are linked with the four forms of intangibles (agriculture, forestry, and water utilities)
- Better visibility of natural capital investments could be taken on internally through clearer managerial accounting/audit committee reporting, or externally through more complete disclosure, narrative reporting, and directed communication to key investors.

Applicability of the method

What changes would be required for this method to be widely applied?

Clarity and guidance on its implementation using current standards, and (over time) changes to the standards to ensure they are more inclusive of different forms of natural capital investments.

How can this be of use for further standardization, including by standard steers or government regulation?

Specific recommendations include:

- Provide guidance on the application of IAS 38.
- Develop a study to build consensus on the application of accounting practices for intangibles and natural capital accounting.
- Call for action by the IASB, national standard setters, and regulators to ensure that companies are applying the standards correctly in capturing investments in natural and social capital.
- Engage with the IASB to consider revising IAS 38, such as relaxing the requirements/criteria for capitalization of investments.

Is this method broadly replicable?

Yes, in regions that follow IFRS.

Table 1 is an illustrative example of the impacts of the above method on a financial balance sheet – focusing on changes to the entries within the financial statement. Table 1 shows the results a hypothetical water company case study further developed in Annex A. The results showcase the impacts of capitalizing investment would reduce cash/other current assets in the year of the investment (-€5 million) and result in an equivalent increase in non-current asset recognized (+€5 million). Overall, there is no net effect on the

balance sheet entries. In subsequent years, non-current assets would fall, in line with amortization, and retained earnings will fall by an equivalent amount (from the amortization expense), depending on the useful life of the investment.

Table 1: Example of an adjusted balance sheet under the Accounting for Intangible Assets Method in a hypothetical water company

Assets	**EUR**
Current assets	-€5 million
Non-current assets	+€5 million
Total assets	**X**
Equity	X
Liabilities	X
Total equity and liabilities	**X**

For more details on this method, please refer to Annex A.

3.2 Method 2: Value Added Statement for Nature

Description of the method

Authors: Paolo Quattrone, Kefei Wu

Description of method

The method modifies the Value Added Income Statement to add a "provision for nature" and highlight the destruction of and the need for reintegrating natural resources through the establishment of a Fund for Nature in the balance sheet.

Does this relate to natural, human and/or social capital?

The method relates to natural capital.

How does this increase visibility of natural capital?

The method extends the value added format of the financial income statement to focus more specifically on a new provision for nature as an explicit form of capital.

Link to financial accounting

How would this method be interpreted today under current accounting rules?

It would require changes in regulations to allow the provision and related funds to be booked at the end of the accounting year

What gaps in the current financial accounting approach does this method work to address?

The method addresses the lack of attention to the destruction and need for reintegration of natural resources

What is innovative about the method?

Its innovation lies in its simplicity as it takes something well established in the accounting tradition and measuring practices (i.e., the Value Added Statement) and redesigns it to give visibility to the use and/or restoration of natural resources.

Case study

Which subject matter and data are used in the case study?

Financial data from German companies using value added statements

- Location: Germany
- Sector: Automotive
- Spatial scale: International
  Type of data: Real, anonymized

What are the results of the case study?

The case study shows the technical feasibility of the proposed method.

What is the final accounting result/output of the case study?

The study shows the potential for the method to affect firms' and individuals' behavior positively when dealing with the consumption of natural resources, making them aware of the impact of their economic activities by internalizing the externalities of such activities.

Other conclusions?

A value added framework also helps make visible the managerial philosophy and the negotiations between management and wider stakeholders in relation to environmental issues. If the proposed method is institutionalized through regulation, it can then readily enter into concerns of the public and auditing considerations.

Applicability of the method

What changes would be required for this method to be widely applied?
Testing of the methodology by companies combined with feedback on implementation from various practitioners, including standard-setting bodies and national regulators.

How can this be of use for further standardization, including by standard steers or government regulation?
It could be part of a policy process leading to the issuing regulations on a new format for the income statement and balance sheet of quoted corporations and beyond.

Is this method broadly replicable?
Yes

Table 2 summarizes the adjusted value added income statement, with the inclusion of the additional line for the provision of nature for an anonymized company. It shows that, in this case, 10% of value is distributed to nature.

Table 2: Adjusted Value Added Income Statement of an anonymized company under the Value Added Statement Method

	2018 in EUR million	
VALUE PRODUCED		
Revenues	77,984.00	
Financial income	791.20	
Other income	619.20	
Total Output	79,394.40	
Cost of materials	42,505.60	
Other expenses	10,339.20	
Bought-in Costs	52,844.80	
Gross Value Added	26,549.60	
Depreciation and amortization of total tangible, intangible, and investment assets	6,752.80	
Net Value Added	19,796.80	
VALUE DISTRIBUTED		
Provision for Nature	1,979.68	10.00%
Employees	8,984.88	45.39%
Providers of finance (non-equity)	1,643.76	8.30%
Government/Public sector	1,999.44	10.10%
Shareholders	1,658.16	8.38%
Group	3,466.08	17.51%
Minority interests	64.80	0.33%
Net Value Added	19,796.80	

The adjusted balance sheet is also illustrated in Table 3.

Table 3: Adjusted Balance Sheet of an anonymized company under the Value Added Statement Method (in EUR million)

Assets		Equity and liabilities	
Non-current assets	100,353.60	Subscribed capital	526.40
Current assets	66,830.40	Capital reserves	1,694.40
		Revenue reserves - original	44,896.80
		Adjustment: Provisions for Nature	-1,979.68
		Revenue reserves - adjusted	42,917.12
		Accumulated other equity	-1,070.40
		Equity attributable to shareholders	**44,067.52**
		Minority interest	423.20
		Equity	**44,490.72**
		Pension provisions	1,864.00
		Fund for nature	1,979.68
		Other provisions	4,620.80
		Deferred tax	1,444.80
		Financial liabilities	51,817.60
		Other liabilities	4,239.20
		Non-current provisions and liabilities	65,966.08
		Current provisions and liabilities	56,727.20
Total assets	**167,184.00**	**Total equity and liabilities**	**167,184.00**

For more details on this approach, please refer to Annex B.

3.3 Method 3: Comprehensive Accounting in Respect of Ecology (CARE) Model

Description of the method

Authors: Alexandre Rambaud and Clément Feger

Description of method

A direct extension of historical cost accounting specifically extending the principle of protection of produced/financial capital to natural and human capital*s*. This is implemented through inclusion of social and environmental issues in the balance sheet and income statement, and extension of financial solvency to environmental, human and social solvency. Social and environmental issues are:

- Addressed through the preservation of “capital” “entities” (climate, biodiversity, soils, human beings employed, etc.).
- Reflected in the balance sheet and income statement by the recognition of social and environmental liabilities (debts).

Natural and human capitals, conceived as liabilities, are valued at their preservation costs (prevention or restoration – not compensation – costs).Assets are uses of capitals (financial, natural, and human).

The income is the surplus of revenues after all the capitals have been preserved.

To be fully operational, CARE ultimately needs to be articulated with the “accounting for the management of ecosystems” model that accounts for the ecological performances reached at the level of the collective management of a given natural capital entity.

Does this relate to natural and/or human and social capital?

The method relates to all the capitals, outlined for natural capital.

How does this increase visibility of natural capital?

CARE articulates in the business model, through the “double entry”, societal demands, represented on the liabilities side (preservation of capital entities - natural and human/social capitals are considered as liabilities) and organizational needs for profitability/operation (represented on the assets side, designed as uses of the liabilities).

Link to financial accounting

How would this method be interpreted today under current accounting rules?

This is an extension of the concept of liabilities, assets, expenses, revenues, and income in line with historical cost accounting theory. Adaptable to most *national* accounting standards (like the French Generally Accepted Accounting Principles, GAAP).

What gaps in the current financial accounting approach does this method work to address?

- Lack of dedicated accounts for environmental and social issues
- Integration of some non-financial information is only from the perspective of the (negative and positive) impacts of (natural and social) environment on business, and not from the impacts of business on the (natural and social) environment
- Lack of environmental and social (scientific) objectives, including in the case of provisions (investments for an ecological transition, including environmental and social expenditures to prevent damage and restore)
- No distinction between operating activities and activities to reduce or avoid negative socio-environmental impacts
- Lack of fully integrated performance, which leads to separating financial and non-financial analyses/notations
- Prevalence (in particular, in the case of IFRS standards) of short-term values, and thus measured profitability may not be sustainable, especially in the long term, but made at the expense of capital entities to be preserved.

What is innovative about the method?

CARE and the associated research, R&D, and experimentation program is based on the observation of a convergence between:

1) the requirements of "strong sustainability," based on scientifically and collectively determined preservation/conservation needs and targets (e.g., respect of a 2°C trajectory for climate; conservation of certain levels of biodiversity);
2) the theoretical principles of traditional accounting, at historical cost, purport to manage a capital "thing" to be preserved, meaning "financial capital", provided directly or indirectly by shareholders, banks, suppliers, etc., through its uses (assets), its consumptions (expenses), and the revenues that can be realized accordingly.

CARE is therefore an extension of the purpose of historical cost accounting. All capitals in CARE are treated symmetrically. In addition, the extra-financial and financial aspects are directly linked and associated to socio-environmental scientific objectives.

Case study

Which subject matter and data are used in the case study?

Three experimental uses of CARE in France are reported, illustrating its application to different sectors: (1) A global real estate company; (2) A farm / experiment on one site / Location: France / real data completed by scenarios (for budgets); (3) a French real nursery company / experiment on one site / Location: France / real data completed by scenarios (for budgets)

General results are also based on examples from a series of current experiments in the south of France in different sectors (industrial, distribution, etc.) ranging from SMEs to multinationals.

What are the results of the case study?

Cases illustrate how use of CARE provides more complete information on the costs associated with a sustainable business model, by distinguishing between preservation costs and operating costs, and by providing an appropriate classification to enrich analysis of the company's internal performance (e.g., is profitability at the expense of the environment?).

What is the final accounting result/ output of the case study?

An adjusted balance sheet

Other conclusions?

The results support dialogue with:

- Investors (e.g., possibility of basing investment on integrated performances; possibility of distinguishing between different financing needs between operating activities and preservation of capitals) and customers (e.g., presentation of the costs associated with preserving capitals)
- Public authorities (e.g., accounting system capable of defining the basis for socio-environmental taxation and subsidy policies). By articulating CARE with the “accounting for the management of ecosystems” model, possibility to create new accounting links between:
  - environmental regulations/standards and ecological targets defined at national and EU levels,
  - structured and pre-standardized ecological accounts at the ecosystem scale, and
  - the assessment of individual firms’ environmental performances and accountability

Applicability of the method

What changes would be required for this method to be widely applied?

Some level of standardization is required to integrate the CARE model into financial and natural capital accounting practices.

How can this be of use for further standardization, including by standard steers or government regulation?

CARE makes it possible to produce fully integrated balance sheet and income statements, aligned with scientifically and collectively determined objectives (including IPCC and IPBES data) and strong sustainability issues. Combining CARE with the “accounting for the management of ecosystems” model can allow tracking and assessing in ecological terms the specific contributions brought by a firm to environmental performances and regulatory targets at the ecosystem scale.

These integrated analyses can serve as a basis for “integrated ratings” for a finance oriented towards strong sustainability with real impacts.

CARE provides a framework for pinpointing green/sustainable investments.

Is this method broadly replicable?

Yes

Table 4 shows the impacts of the CARE method on an income statement in the case of a hypothetical apple and wheat farm, which is further developed in Annex C. The soil is the natural capital that needs to be preserved in this case. The following account shows the income statement of the farm for a specific year, providing better visibility to natural capital by inclusion of: (i) natural capital operating expenses and (ii) preservation of soil expenses.

Table 4: Income statement of a hypothetical farm application under the CARE model (thousand EUR)

Operating expenses and revenues			
Expenses on financial capital			
Amortization expenses (tractor)	50		
Expenses on natural capital			
Current expenses	50		
Amortization expenses (tree plantation)	150		
Preservation of capitals			
Preservation of soil	145	Restoration (ex post preservation)	145

Table 5 shows the balance sheet of this farm with the new additions of the CARE model, including: (i) explicit information about amortization and depreciation of assets and (ii) an explicit distinction of different types of issues (financial and natural) and (iii) the articulation between natural and financial capitals (liabilities) and assets (financial, natural, and mixed) and (iii) the preservation of capitals.

For more details on this approach refer to Annex C.

Table 5: Balance Sheet of the farm application under the CARE model (thousand EUR)

Financial issues					
	Gross	**Amortization and Depreciation**	**Net**		
Fixed assets[1]				Financial capital	1500
Field	1000	0	1000		
Tractor	500	50	450		
		Natural issues			
Fixed assets[2]					
Tree plantation	450	150	300	Soil (natural capital)	355
Current assets[2]					
Wheat cultivation			0		
Finished goods (apples)			75		
Mixed assets[3]					
Finished goods (wheat)			50		
Preservation of capitals					
New resources (from sales)			15	Grant	60
				Income	**-25**

[1] Financial assets i.e., assets as uses of financial capital.
[2] Natural assets, i.e., assets as uses of natural capital (soil here).
[3] Mixed assets: uses of different capitals (financial and natural capitals here).

3.4 Method 4: Integrating natural capital into financial accounting

Description of the method

Authors: Jeremy Nicholls and Adams Koshy

Description of method

This method is a proof of concept of one potential direction of travel of financial and natural capital accounting, particularly given the recent evolution of natural capital accounting to reflect its financial accounting counterparts.

Does this relate to natural, human and/or social capital?

Potential application to all, outlined using natural capital.

How does this increase visibility of natural capital?

Through a single set of integrated accounts, it allows for complete integration of natural capital within decision making and reporting through a single, integrated balance sheet and income statement.

Link to financial accounting

How would this method be interpreted today under current accounting rules?

The method is not within current financial accounting standards, but builds on both financial and natural capital accounting practices.

What gaps in the current financial accounting approach does this method work to address?

The method addresses the issue that financial reporting currently does not account for a number of the impacts and dependencies to natural capital. For many investors and analysts, financial reports are the primary source of data on a business and these reports do not consider the separate reporting in natural capital statements. This method illustrates the integration of natural capital accounting with financial accounting to produce a more holistic set of accounts.

What is innovative about the method?

The method illustrates integrated reports using specific natural capital accounting methods that have, so far, only been reported separately. This is not the first, nor only, application of integrated reporting, but focusing on these final reporting statements helps to focus the discussion on the transition to more integrating accounting.

Case study

Which subject matter and data are used in the case study?

Two case studies anonymized – a multinational organization and a paper and pulp company.

- Location: International
- Sector: All (illustrated for supply chain-focused business and forestry business)
- Spatial scale: Corporate
- Type of Data: Anonymized data reported publicly

What are the results of the case study?

They show the potential results if natural capital accounts were integrated with financial accounts.

What is the final accounting result/ output of the case study?

An integrated income statement (Case 1) and integrated income statement and balance sheet (Case 2)

Other conclusions?

Use of this method would require either that International Accounting Standards had to change, or national financial accounting policy would not require consistency with International Accounting Standards, but mandate accounting practice designed to reflect investors motivated to make financial, social, and environmental returns.

Applicability of the method

What changes would be required for this method to be widely applied?
Standardization of natural capital accounting practices and methodology as well as changes to the financial accounting standards, to more closely align with the former. This process will need to be coordinated bottom-up through regulatory support from policy makers.

How can this be of use for further standardization, including by standard steers or government regulation?
This methodology could help inform the debate, especially in the transition towards more integration.

Is this method broadly replicable?
Yes, this would be replicable, but would first require changes in the financial accounting standards, regulations, and principles to accounting.

The integrated income statement (Table 6) and balance sheet (Table 7) illustrate one possible approach of integrating natural capital impacts and dependencies in the case of an anonymized company that is further developed in Annex D. For the income statement (Table 6), this shows the inclusion of a negative impact on society, which enters into the balance sheet through retained earnings. The natural capital benefits and the costs of maintaining those (natural capital assets and liabilities respectively) are also reflected in the balance sheet (Table 7). For more information refer to Annex D.

Table 6: Example of an integrated income statement in 2018 under the Integrating Natural Capital into Financial Accounting method.

Integrated Income Statement (2018)	**Value to business** EUR million	**Value to society** EUR million	**Total value** EUR million
Net sales	2,841		2,841
Other operating income	319		319
Change in inventories	-24		-24
Change in value in biological assets	127		127
Raw materials and consumables	-1,032		-1,032
Personnel costs	-469		-469
Other operating expenses	-1,157		-1,157
Result from joint ventures and participations in associates	-1		-1
Items affecting comparability	21		21
Net contribution to natural capital		**-321**	**-321**
EBITDA	**626**		**304**
Depreciation	-206		-206
Operating profit	**420**		**99**
Financial income	7		7
Financial expenses	-23		-23
Profit before tax	**404**		**83**
Taxes	-77		-77
Profit for the period	**327**		**6**

Table 7: Example of an integrated balance sheet in 2018 under the Integrating Natural Capital into Financial Accounting method.

Integrated Balance Sheet (2018)	Value to business EUR million	Value to society EUR million	Total value EUR million
ASSETS			
Non-current assets			
Biological assets	5,687		5,687
Natural capital assets	**3,103**	**13,580**	**16,683**
Other non-current assets	2,899		2,899
Total non-current assets	11,688		25,268
Total current assets	926		926
Total assets	**12,614**		**26,194**
EQUITY AND LIABILITIES			
Equity			
Owners of the Parent			
Share capital	434		434
Other capital provided	1,262		1,262
Reserves	-677		-677
Reserves to natural capital	**-1,388**	**7,943**	**6,555**
Retained earnings	6,361	**-321**	6,040
Total equity owners of the Parent	**5,993**	**7,622**	**13,615**
Non-controlling interests	0		0
Total equity	**5,993**	**7,622**	**13,615**
Non-current liabilities			
Natural capital maintenance cost provision	**5,532**		**5,532**
Other non-current liabilities	1,535		1,535
Total non-current liabilities	**7,066**		**7,066**
Total current liabilities	**595**		**595**
Total liabilities	**7,662**	**-**	**7,662**
Total equity and liabilities	**13,655**	**7,622**	**21,277**

4. What next?

As we have seen, the four methods presented here have different positions in the landscape of integration of financial and natural capital accounting practices (Figure 2). This has implications for the development of these methods as well as for policy making to support further standardization.

The shared blueprint set out by the Sustainable Development Goals provides the case for a positive system transformation that will offer significant opportunities for first movers. As any change, it requires the participation of all the different parts of the system. Public finance needs to lead the way while private actors need to provide the scale of investment. Improving integrated reporting is crucial to integrate the private sector and wider stakeholders in the successful achievement of the Goals.

A summary of potential actions required for further development of these methods is summarized below:

- **Method 1 – Integrating Natural Capital Accounting Practices into Financial Accounting of Intangible Assets**: The actions to generalize practice of this method mainly focus on engagement with key players, including the International Accounting Standards Board to: (i) revise or provide further guidance on the application of the standard; and (ii) to ensure its correct application (which will also involve national standard setters and regulators). To expand the scope of this method, the gaps in current accounting standards need to be more fully assessed in order to determine where harmonization could be proposed, or additional disclosure would be appropriate.
- **Method 2 – Value Added Statement for Nature**: The method calls for relatively small changes on the reporting format (by introducing a "Provision for Nature" line in the income statement and a related "Fund for Nature" in the balance sheet). The method may not require additional data to those already available to firms. Although small changes in format and data collection are needed, a wide application of this method may require actions in terms of: (i) further application and testing of the method by companies to prove its practicality; and (ii) large engagement with accounting standard-setting bodies to discuss changes in accounting rules, as well as with national regulators to introduce legislative changes to promote these changes.
- **Method 3 – Comprehensive Accounting in Respect of Ecology (CARE) Model**: This method is compatible with existing accounting standards, but it proposes the inclusion of new types of liabilities and assets. These changes require an in-depth revision of the existing accounting standards, meaning this method will likely require greater efforts to reach agreement among accounting standard setters and will require significant work on accounting standardization to become an operational model.
- **Method 4** – **Integrating Natural Capital into Financial Accounting**: The widespread adoption of this method would depend (at the very least) on changes to accounting standards and company law, requiring current financial accounting to include statements of non-financial values. This will require a multi-action approach, working on; strengthening the standardization of monetary valuation of natural capital impacts and dependencies; reviewing reporting requirements by accounting standard bodies, and reinforcing the adoption of new reporting requirements by policy makers.

In addition to these specific actions, all four methods would benefit from further piloting/application to verify their practicality with existing data, scalability across spatial areas, and applicability to different sectors.

Due to their different levels of ambition and development, each method requires a different level of action. Nevertheless, any progress towards better visibility of natural capital into financial accounting requires the involvement of all different stakeholder groups, from accounting standard-setting bodies, accounting professionals, asset owners (investors), business, policy makers, academics, and practitioners. It is in their

mutual interest to cooperate and to take this work forward and build on the small block of material provided by this report. Discussions should no longer dismiss such action as impractical, as this report demonstrates a number of practical options for financial accounting processes to pursue to make natural capital visible. The conversation going forward should focus on which of these four approaches (or others) is best suited to respond to specific accounting questions on natural capital.

Some examples of engagement processes that we hope can utilize this report are:

i. **Harmonizing accounting frameworks, rules, and principles**: Progress on standardizing natural capital accounting frameworks to support business decision making and business strategy development. The Natural Capital Protocol and the Social & Human Capital Protocols are frameworks to help in measurement and valuation. The further development of accounting frameworks, rules, and principles will help as a stepping-stone to build accounting structures to track business progress and enable further external disclosure. Some forthcoming initiatives, such as the Value Balancing Alliance or the development of Environmental Generally Accepted Accounting Principles (E-GAAP) (in the context of the TRANSPARENT project funded by the European Commission for the period 2020-2022), will provide an opportunity for starting the process of harmonization of accounting standards.
ii. **Nature-Related Financial Disclosure**: Following the example of the Taskforce on Climate-Related Financial Disclosure opportunities are explored to set up a comparable taskforce to bring together the different stakeholders to agree on the need for and approaches on nature-related financial disclosure. This task force would be to develop international agreements and standardization that support future investment decisions towards businesses that conserve and enhance nature and people's well-being.
iii. **Impact Management Project**: A forum of over 2,000 organizations to build global consensus on how to measure and manage impact, including a structured network of standard-setting organizations.

CAPITALS COALITION

ANNEXES

Annex A –Integrating Natural Capital Accounting Practices into Financial Accounting of Intangible Assets

1. Overview

This method focuses on how natural capital measurement could be (partially) integrated into financial accounts, based on the current international accounting standards on intangible assets. Under International Accounting Standards (IAS) 38, which sets out treatment and disclosure as applied to the recognition and measurement of intangible assets, intangibles refer to investments into non-physical items, such as fishing quotas, staff training, research and development, and customer or supplier relationships. The accounting method discussed here sets out how intangibles (as defined by the standards) that relate to natural capital could be interpreted under IAS 38, what barriers currently limit this implementation of the standards, and how the standards could be revised to provide a more complete measure of a business's natural capital impacts and dependencies.

2. Context

The International Accounting Standards (IAS) set a clear objective for financial reporting: "to provide financial information that is useful to users in making decisions relating to providing resources to the entity" (IFRS Conceptual Framework (IFRS, 2018)). However, there are concerns that financial reporting statements no longer provide all the information required for stakeholders to undertake decisions (Bernanke, 2011; Haskel and Westlake 2017; Lev and Gu, 2016). For example, evidence is mixed on the current usefulness of financial information to investors (Lev and Zarowin, 1999; Collins et al., 1997; Core et al., 2003). One possible driver for this is the increasing prominence of (non-physical) intangibles within businesses (Zéghal and Maaloui, 2011).

This method has identified four (specific) forms of intangibles that relate to natural capital:

i. Resource quotas – for example, investment into/allocation by government of fishing quotas, defined by the maximum sustainable yield of fish and other aspects of the (biological) stock of fish.
ii. Training costs to improve management of natural capital – investment into training to educate staff on how best to manage land to maintain and/or enhance natural capital, or training to implement sustainable practices in the supply chain to reduce emissions or use of resources.
iii. Development costs for natural capital solutions to land management – investments into land management practices to maintain and/or enhance the value of the underlying natural capital.
iv. Brand valuation – integration of natural (and social) capital valuation into the brand value/loyalty of a business. Business investments into natural capital and communication around natural capital management and enhancement could have an influence on brand value that extends beyond the cost of implementing the investments. For example, this could be realized through brand loyalty, a core marketing aim (for sustainable brands), or reflected in the resilience of share prices to negative (internal or external) shocks (e.g., news stories).

The following subsections show how these four forms of intangibles would be treated under current financial accounting practices in IAS 38, and how this could integrate current natural capital accounting practices.

2.1 Links to current accounting practices

Intangibles refer to a broad category of investments into non-physical items. Some of these meet the five strict criteria (see Box A1) for recognition as an "intangible asset," *an identified non-monetary asset without physical substance* (IAS 38.8). Recognizing such assets creates visibility for investments into intangibles in financial reporting and, by entering the balance sheet, requires a company's management to make explicit their approach to the asset's measurement, changes in value, and useful life. Companies do not always capitalize these intangibles, choosing to either: (1) expense the investment;[4] (2) account for it under "goodwill" when a business/division is acquired; or (3) account for the investment within other physical/tangible assets.[5]

Box A1: Recognition of intangible assets under International Accounting Standards 38

The following criteria must be met for an intangible asset to be recognized:

1. The asset is identifiable (IAS 38.12) – either because it can be separated/divided from the business or because the intangible arises from contractual/other legal rights;
2. The business has control of the asset (IAS 38.13) – the business can obtain future economic benefits from the asset and restrict access of others to those benefits;
3. There are future economic benefits that flow from the asset (IAS 38.17) – including sale of products/services, cost savings, or other benefits that are probable as a result of the investment;
4. It is probable that the expected future economic benefits will flow to the business (IAS 38.21a); and
5. The costs of the investment can be measured (IAS 38.21b).

If an intangible asset is recognized under IAS 38, it is initially recognized at cost – the expense incurred in the investment.[6] Following this, the business can choose to follow either the cost model (i.e., initial cost less accumulated amortization) or the revaluation model (i.e., fair value less accumulated amortization). Given that fair valuation is measured in reference to an active market, which is not likely to exist for most natural capital-based investments, the cost method is likely to be the more practical approach for measurement. The following outlines how each of the four intangibles could be interpreted under the standard:

(I) Resource quotas, fishing quotas (in particular) are currently accounted for as an acquisition through a government grant (IAS 38.44). As there is likely to be a market for fishing licenses (where price is likely close to the expected revenue from the fish that can be caught under this license), this is the only intangible (of the four) measured using the revaluation model. This is also the easiest to apply in financial accounting.

(II) Training costs are more challenging to integrate under the standard. According to IAS 38.15 "*An entity may have a team of skilled staff and may be able to identify incremental staff skills leading to future economic benefits from training.*" IAS 38.69 indicates that "*expenditure on training activities*" should be recognized as an expense, this is (in particular) due to the difficulties in having sufficient control over future economic benefits from staff (i.e., the ability of a business to ensure that staff will continue to work for them). This criteria

[4] This means that the investment is accounted for only as a cost in the year it is incurred, and the amount is reflected in the income statement.

[5] Where the intangibles have a material impact on the asset, they should already be accounted for in its fair valuation, for example for biological assets like crops (IAS 41) or mining resources IAS 16). Alternatively, natural capital assessments could be integrated into an impairment test – which would only test if the value of the land could be written down in each reporting period – or to meet specific legal requirements. For example, natural capital assessments could be used to meet the concept of 'usufruct' (i.e., a legal right to temporarily use and derive income/benefit from someone else's property). This is outside the scope of the discussion of this report but could be explored in further research.

[6] However, these values cannot be included retrospectively in the accounts (i.e., for historic costs that have already been expensed).

can only be met if the contractual relationship with the beneficiary of training is linked to a legally binding long-term contract.

(III) Development costs are even more challenging to integrate. In addition to the criteria for recognition as an intangible, there are six additional requirements for development (see Box A2). According to a study undertaken by Deloitte/ACCA, the majority (around 62%) of companies in its sample expensed development costs. Results of the study indicated an important part of this was due to the difficulties of achieving all six requirements under IAS 38 (ACCA, 2019).

Box A2: Recognition of research and development under International Accounting Standards 38

Research is defined as "*original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding*" (IAS 38.8). Development is "*the application of research findings or other knowledge to a plan for the production of new or substantially improved materials, devices, products, processes, systems, or services before the start of commercial production or use*" (IAS 38.8). Under IAS 38, investment in the **research** phase must be expensed, while investment in the **development** phase can be capitalized. However, a business must demonstrate all of the following requirements (IAS 38.57):

A. It is technically feasible for the business to complete the development project;
B. The business intends to complete the asset;
C. The business is able to use or sell the asset;
D. The intangible asset will generate probable future economic benefits – whether from sales or usefulness internally;
E. There are sufficient technical, financial, and other resources to complete the development and to use/sell the asset; and
F. The business is able to reliably measure the expenditure on the asset in development.

In particular, the key difficulties are:

- Requirement C – the most difficult to achieve, commonly referred to as a test of the *commercial viability* of the intangible. If the intention is only to sell a good/service, investment into natural capital is unlikely to meet this criterion. The standard also references that this criterion could be met by internal use, which could (for example) reduce operating costs of the business, as long as the business demonstrates that the asset will generate future economic benefits. However, management should not anticipate the recognition of benefits in the financial statements (e.g., from choosing between alternative investment decisions), as this is often part of the normal course of business and would overstate any benefits.
- Requirement D – requires measurement of the future economic benefits. This may be more difficult for natural capital benefits, which are often more uncertain than financial instruments or investments into physical capital. However, the standard references IAS 36 (on impairment of assets), which implies that this measurement (referred to as "value in use") should include calculations that involve cash flow projections, possible variations in the timings of cash flows, and appropriate discount rate (accounting for the time value of money, price for uncertainty, illiquidity, etc.). Although more difficult to achieve, it simply sets a high bar for the level of analysis.

As such, development costs on natural capital can be capitalized, but it may not be an easy process.

(IV) Brand valuation is outside of current IAS 38 standards. According to IAS 38.63, "*internally generated brands….customer lists and items similar in substance shall not be recognized as intangible assets.*" The only situation where brand value will be recognized is within goodwill[7] acquired as part of a business combination (see International Financial Reporting Standard (IFRS) 3). This is to prevent management from overstating its assets. It means that internally generated goodwill cannot be recognized (IAS 38.48) and if brand value is recognized at acquisition, it does not distinguish the contributions of natural capital practices from other aspects. In general, there is a difficulty in measuring brand value as, unlike other intangibles, this does not relate to a specific investment but a combination of historic and current investments, targets, marketing, etc.

It is (in theory) possible to recognize resource quotas, training costs, and development costs as intangible assets under current accounting standards. However, difficulties in meeting the criteria have limited the application of these standards and management are (rightly) cautious when applying these standards.

2.2 Links to natural capital accounting practices

The natural capital accounting terminology recognizes these four forms of intangibles in accounting terms as tangible current/future benefits from natural capital assets managed by the business. Following what is applicable under IAS 38 allows for some integration of natural capital accounting practices but the focus is entirely on the value to business (i.e., not accounting for value to society). Measurement of the intangibles is based on market values or the costs of implementing the measures (i.e., excluding all non-market values). For the four forms of intangibles:

- Fishing quota – there is limited overlap with natural capital accounting practices. The quota provides fishermen with a right to future benefits from the sale of fish caught and can be seen as an indicator of natural capital stock, reflective of the biological state of fish stock. However, it is a weak measure of natural capital, based on the condition (and partially reflective of extent) of fish stock.
- Training costs – this would be a partial representation of the value of natural capital benefits, measured at the cost of the training, which does not account for any non-market benefits from improvements in natural capital. In practice, training costs are also only a partial valuation of the inputs that go into the capital maintenance and management of the natural capital, other costs include equipment, research studies, etc.
- Development costs – this too would be a partial representation of natural capital benefits. Compared to training costs, these offer a greater coverage of spending. However, this does not account for any non-market benefits from enhancements to natural capital.
- Brand value – this has the greatest potential to cover a number of elements of natural capital, allowing for *some* measure of the value to business and to society. However, this is also the most theoretical of the four, as the exact value of brand associated with natural capital/sustainability may not be separable from other aspects of the business and the valuation of these is not related to a specific investment/program of investments. In some situations, the best available proxy of this may be the costs of natural capital maintenance (e.g., forest management), but this could risk double counting if procedures do not follow double-entry bookkeeping in calculating brand value. Therefore, brand value could reflect a number of non-market benefits, but it may not be possible to state which.

Overall, this methodology allows for some integration of natural capital accounting practices, although limited, as the focus of the method is on what is achievable within current accounting standards.

[7] Goodwill is defined as the difference between the fair value of the equity and the amount spent to acquire a majority/minority stake in a business – see International Financial Reporting Standard (IFRS) 3 for more information.

3. Results

Among the four forms of intangibles, the application of (i) training costs to improve management of natural capital and (ii) development costs of natural capital solutions to land management offer the greatest prospects for progressing integration.[8] The following case studies, therefore, outline the potential application of these two forms with hypothetical, but realistic, data to show what a new asset line item in a balance sheet could look like. Both case studies are accompanied by practical examples of similar investment programs publicly reported by companies. Given that this is based on public information, available details are limited.

3.1 Case Study 1: Training costs

Hypothetical scenario: A food and beverages business is investing €2 million in 2019 to train farmers to implement organic farming practices, spending €10,000 per farmer. This includes 100 farmers who are tenants of land owned by the business, with (on average) 50-year leases, and a further 100 farmers who own their own land but are part of the scheme. The business has exclusive rights to purchase produce from the 100 tenant farmers over their lease and has 5-year contracts in place for exclusive rights with the remaining 100 farmers. The 200 farmers' produce contributes to approximately €500 million in sales of fruit and vegetables for the business. In order to receive the investment, the farmers have to sign a supplemental agreement to maintain organic practices for (at least) the term of their respective contracts.

According to an internal project proposal, this investment will allow the business to label its produce as organic, which is expected to increase the chargeable price of fruit and vegetables by 0.1% (in real terms). Current market outlooks predict that the quantity sold is unlikely to increase over time. No further increases in the costs to the farmers are expected and it is assumed that the farmers will only charge for an increase in prices in line with inflation. All of the farmers have been asked to maintain the organic practices for the foreseeable future.

As shown in Table A1 the investment into training costs in this hypothetical case is likely to meet the criteria for recognition as an intangible asset for the 100 tenant farmers but not for the rest.

Table A1: Criteria for recognition as an intangible asset

Criteria	Likely response for investment	
	Is criteria achieved?	Explanation
1. The asset is identifiable	Yes	The economic benefits from each of the farmers is individually identifiable due to the long-term lease contracts, 5-year exclusivity contracts, and supplemental agreements related to the training
2. The business has control of the asset	Yes, partially	For the 100 tenant farmers, the business has control, so these costs are recognized. As the business does not control the practices of the 100 farmers who own their own land, these costs are not recognized
3. There are future economic benefits that flow from the asset	Yes	For all 200 farmers there are economic benefits in the form of increase in market price to the business
4. It is probable that the expected future economic	Yes	This is likely as all 200 farmers sell their produce to the business, and the business has exclusivity with the farmers

[8] The application of fishing quotas is already common practice and use of brand value will require changes to the standards.

Criteria	Likely response for investment	
	Is criteria achieved?	Explanation
benefits will flow to the business		
5. The costs of the investment can be measured	Yes	The business knows it has spent €2 million for this specific training program

As the business has control over only the 100 (out of 200) farmers who are tenants, €1 million will be expensed in 2019 and the remaining €1 million is included under non-current assets. In this case, the useful life of the asset will also likely follow the 50-year lease (in line with IAS 38.94). Given that there is no indication of how benefits (i.e., mark-up) would change, the default approach is for the asset to be amortized on a straight-line basis over the 50 years (IAS 38.97). Changes to the balance sheet in 2019 resulting from this investment would be as set out in Table A2 where it is assumed that the training costs are paid for in the year using cash or another form of current asset; and the cost incurred for the 100 non-tenant farmers reduces net income and therefore retained earnings. In following years, the non-current asset would fall by €20,000 per year and would be expensed in the income statement as an amortization expense (which is reflected in the retained earnings).

Table A2: Changes to the balance sheet as of 31st December 2019 (EUR)

Assets	€
Current assets	-€2 million
Non-current assets	+€1 million
Total assets	**-€1 million**
Equity	
Share capital	X
Retained earnings	-€1 million
Liabilities	X
Total equity and liabilities	**-€1 million**

However, this does not account for all of the value from this investment:

- Value to business: the balance sheet line item would read €1 million in 2019, while the benefits from the increase in revenue over the 50 years could be several fold higher. To illustrate this (in line with IAS 36), assuming that the 0.01% uplift and revenue (in real terms) were to remain constant over the 50 years, a weighted average cost of capital (WACC) of 3% and a risk premium of the investment of 2% means that the present value of the economic benefits to the business is approximately €9.5 million. For the business this means a net present value of approximately €7.5 million from the full training program (200 farms).
- Value to society: the benefits of transitioning to organic include reducing the negative impacts of chemical fertilizers and pesticides that are put into soil and released into the air (e.g., ammonia) or result in runoff into the water system (e.g., nitrates). Although these benefits are unlikely to be directly realized by the business, there could be an indirect impact on the business as this changes exposure to government regulations within their supply chain and could protect farmers from possible social action.

Although only a partial measure, if this value were to be capitalized and included in the balance sheet it would be a step up from current practice, which is to simply expense these values.

Although hypothetical, this example is realistic as large agribusinesses do invest into farms, some of which would have leases/long-term agreements in place to secure their supply of produce in the long term. For example, the agribusiness Mondelez earmarked investments of $400 million between 2012-2022 into their "Cocoa life" supplier sustainability program which includes training farmers in sustainable practices and planting non-cocoa trees on cocoa farms.[9] Similarly, Olam trained over 285,800 farmers in 2018 in Good Agricultural Practices to improve crop yields (Olam, 2018). In the paper and pulp sector, the Swedish company SCA invests in regular training in nature conservation for all company employees.[10]

Limitations of the above example include that a binding long-term contract (to meet the criteria for control) may not be in place.[11] Shorter contracts are not beyond the scope of the standard and would mean that the amortization would occur over (for example) 10 years rather than 50 years.

Table A3 provides an overview on main pros and cons of this method for training cost.

Table A3. Pros and cons of accounting for training costs under the Accounting for Intangible Assets Method

Pros	Cons
• These investments are already being undertaken and the method allows a business to communicate and manage a measure of the investments into natural capital over several years through its financial reporting statements. Doing so could change corporate perspectives on how natural capital costs are perceived, rather than just considering them within sustainability reporting.	• Only a partial measure of the natural capital benefits are picked up. • It may be difficult to meet the criteria of control, and practical application may be very industry specific (e.g., in agriculture and forestry) • There is some inherent uncertainty in the measurement of natural capital benefits required to meet the IAS 38 criteria

3.2 Case Study 2: Development costs

Hypothetical scenario: a water company catchment includes a peat bog that is in poor condition, resulting in water discoloration and higher water treatment costs downstream from the peatland. The company has spent €0.5 million in a research project (2016-18) to assess the potential improvements to water quality downstream from restoring the peatland. Based on this research, the company has produced a business plan to undertake a more extensive investment spending €5 million in 2019 to restore 10,000 ha of highly degraded peatlands on its land. The company estimates that this investment will help delay or avoid a €10 million investment into a new water treatment plant by 20 years. Another important driver for the company is that engagement with its consumers has indicated that improving water-color is a high priority. However, the final impacts on discoloration from the investment into peatland restoration are far more uncertain than from a known water treatment plant technology.

In this hypothetical case, the investment into development costs for nature-based solutions is likely to meet the criteria for recognition as an intangible asset as well as the specific criteria for development, as set out in

[9] See: https://www.cocoalife.org/the-program/approach

[10] See: https://www.sca.com/en/about-us/our-forest/responsible-forestry/nature-conservation-strategy/

[11] This is not to say that longer-term contracts will not be put into place in the future, which could have longer-term benefits of increased social capital between farmers and agri-businesses and better supply chain continuity for agribusinesses.

Table A4. The greatest concern, in this case, is the inherent uncertainty of realizing improvements in the peatland, which could take longer than expected to achieve or may not be achieved due to other external factors (e.g., droughts). However, the earlier research stage has given the company enough confidence to undertake the investment, particularly given the priorities of its consumers.

Table A4: Criteria for recognition as an intangible asset for Case Study 2 (development costs)

Criteria		Likely response for investment	
		Criteria achieved	Explanation
General	1. The asset is identifiable	Yes	The economic benefits to the water company can be distinguished by its property rights to the peatland upstream of its customers.
	2. The business has control of the asset	Yes	The company owns the peatland.
	3. There are future economic benefits that flow from the asset	Yes	There are expected to be savings of €5 million to the water company. However, there are some uncertainties associated with the benefits of this investment.
	4. It is probable that the expected future economic benefits will flow to the business	Yes	As the water flows downstream to the water company's treatment works, improvements in quality will benefit the company and its customers directly.
	5. The costs of the investment can be measured	Yes	The company knows that this will cost €5 million.
Specific to development	A. Technically feasible to complete	Yes	There are examples of successful peatland restoration projects.
	B. Intention to complete the asset	Yes	Once initiated
	C. Business able to use or sell the asset *	Yes	Based on internal use from expected cost savings related to delaying a more costly substitute investment
	D. Asset will generate probable future economic benefits	Yes	The investment will help delay or avoid a €10 million investment into a new water treatment plant by 20 years.
	E. Sufficient resources to complete the development and to use/sell the asset	Yes	Especially as consumers have indicated that this is a priority area, financial resources will be allocated
	F. Able to reliably measure the expenditure on the asset	Yes	The expenditure on the asset is expected to be €5 million in 2019

** As noted in Section 3, the standard has been interpreted to indicate that the commercial criteria include internal use and not just sales.*

If the asset is recognized, it will be treated in the balance sheet at €5 million, excluding the research costs.[12] The useful life of the investment cannot be classified as indefinite (IAS 38.91), as it depends on some level of maintenance of the peatland in order to prevent degradation. For example, if it is determined that another round of investment would be required in 50 years, then (as with the first hypothetical case) the asset would

[12] As set out in Section 2, research costs cannot be included in the intangible asset and as the investment has already.

be amortized on a straight-line basis over 50 years. Alternatively, if management indicates that the €5 million is part of an ongoing program of investment, an indefinite life of the intangible asset could be argued, in which case an annual test of impairment (or when there is an indication of impairment) should be undertaken (IAS 38.108).

Changes to the balance sheet in 2019 resulting from this investment would be as set out in Table A5, where it is assumed that the development costs are paid for in the year using cash or another form of current asset. If the investment is believed to have a 50-year useful life, in the following years the book value of the non-current asset would fall by €100,000 per year and would be expensed in the income statement as an amortization expense (reflected in the retained earnings).

Table A5: Adjusted balance sheet as at 31st December 2019 under the Accounting for Intangible Assets Method (EUR)

Assets	€
Current assets	-€5 million
Non-current assets	+€5 million
Total assets	**X**
Equity	X
Liabilities	X
Total equity and liabilities	**X**

However, this balance sheet would not capture all of the value from this investment:

- Value to business: it provides a partial value by focusing on the costs, as there are benefits from the savings of delaying investment into the new water treatment plant project. Assuming a weighted average cost of capital (WACC) of 3% and a risk premium of 2%, the €10 million delayed by 20 years is approximately €4 million in present value terms (a saving of €6 million), which is a net present value of €1 million from investing in this project (i.e., €6 million saving – €5 million costs), rather than the current valuation of €5 million. Meaning that these private benefits may be overvalued.
- Value to society: additional benefits in the form of flood risk mitigation from reduction of water runoff, reduction in carbon emissions (as degraded peatland is a carbon source), improvements to biodiversity, etc. are not accounted for in this valuation. Again, these are unlikely to influence the water company directly, but are likely to result in (at the very least) additional positive press and opinion about the company and its activities, resulting in potential regulatory, financial, reputational, or societal opportunities.

The above is a realistic scenario that has been reported by multiple water companies operating in the UK. For example, South West Water's Upstream Thinking program involves £11 million between 2015 and 2020 and includes restoring damaged peatland and providing advice to farmers[13] while United Utilities' SCaMP program invested over £20 million between 2005 and 2015 on various upland catchment restoration activities, in conjunction with other organizations. In the paper and pulp sector, the US-based International Paper state that they spent $28 million in 2017 on R&D (International Paper, 2018), but expense this investment following US Generally Accepted Accounting Principles (GAAP).[14] Limitations of this case study include whether the likelihood of benefit is considered sufficient for company accountants to realize the benefits, and additional

[13] *See: http://www.upstreamthinking.org/index.cfm?articleid=8689*

[14] Unlike IFRS, US GAAP dictates that investments into both research and to development should be expensed.

complications when accounting for this type of one-off investment projects when undertaken in partnership with other organizations.

Table A6 provides an overview on main pros and cons of this method for development costs.

Table A6. Pros and cons of accounting for development costs under the Accounting for Intangible Assets Method

Pros	Cons
• Integrates elements of investment beyond training • Justification for investment already likely to have been undertaken by business internally • Allows for communication of investments through financial reporting – particularly when a priority identified by consumers and regulators	• Only a partial estimate of the impacts and dependencies of the business from the investment • There is some inherent uncertainty in the measurement of natural capital benefits required to meet the IAS 38 criteria • Development projects may be in collaboration with multiple organizations

4. Methodology in practice

This section summarizes how integrating natural capital measures into IAS 38 could be applied in practice.

4.1 Innovation

This method is an opportunity to show what could be achieved within current accounting standards, rather than attempting to redefine financial (or natural capital) accounting practices. The innovation is in highlighting specific applications within IAS 38 to focus efforts on integrating some level of natural capital accounting, using data generated by established (natural capital accounting) practices, and possible reasons and pitfalls for this process.

4.2 Application

By design, this approach is practical as it focuses on what could be achieved within the current international accounting standards. There are three key practical challenges to implementation of these standards for the four forms of intangibles listed in this report:

1. Difficulty of meeting the criteria – with five criteria for recognition of intangible assets, and six (further) requirements when looking at development costs, there are a lot of expectations on what is reported. This could deter managers from approaching capitalizing the investment. This is part of the reason why, when looking at development costs, ACCA (2019) recommends that "*relaxing the criteria for capitalization by reducing their number could be the way forward*" (pg. 9). In particular, requirements to show control and (to some extent) prove that economic benefits are achievable with limited uncertainty are more difficult than the others.
2. Prudence and conservatism – the difficulty of meeting the criteria are reinforced by the accounting concept of prudence[15] and a need for managers to be conservative in their reporting of company

[15] Defined in the International Financial Reporting Standards (IFRS) Conceptual Framework: "Prudence is the exercise of caution when making judgments under conditions of uncertainty. Prudence does not allow for overstatement or understatement of assets, liabilities, income, or expenses."

management accounts mean they are more likely to expense the investment (Zéghal and Maaloui, 2011).

3. Internal generation versus acquisition through business mergers – the standards favor the measurement of intangibles obtained through merger (under "goodwill") rather than intangibles that are generated by a company in its operations.

These are key reasons why businesses do not yet routinely capitalize the natural capital investments identified above, even though data exist to do so. This has been further illustrated by the two case studies and the growing use of natural capital accounting in business (Dickie and Neupauer, 2019).

Replicability and scalability of this method is straightforward as it follows the guidance in IAS 38 – irrespective of geography, industry, or regulatory contexts. However, given the difficulties of applying the standard, there may also be a certain level of judgment required to interpret and meet the accounting standard(s) correctly. The four forms of intangibles and case studies illustrated also highlight that application of these standards may be more applicable to certain sectors, in particular fishing, agriculture, forestry, and water utilities. Guidance and outline documents, such as this report, may help clarify the application of this methodology.

4.3 Other aspects

Additional points of consideration include the variation between different accounting standards boards. This method focuses on the standards under International Financial Reporting Standards (IFRS), which is widely used around the world (IFRS, 2018b), although countries like the US have their own accounting standards. For example, the US Financial Accounting Standards Board (FASB) does not allow for capitalization of investments into intangibles.

Further, there are implications of capitalizing expenses. From an accounting perspective, capitalizing means that these investments are not expensed in a single year and (assuming that the useful life is not indefinite) will be spread out over the useful life of the asset. In the first year, when compared to expensing, this would increase the asset base and improve the profits of a business, but by the end of the useful life the net effect of the investment would be the same in both approaches. Another important reason for capitalizing is the need to "match" the economic benefits a business receives (in terms of revenues / reduction in costs) with the investment. Otherwise a company may misstate its financial position, as costs are realized immediately, and benefits are realized over time.

In addition, the purpose of integrating these values is to increase the visibility of the natural capital investments. For most (mainstream) investors, their primary form of information on a business is through its financial reports, which means that although a lot of the information discussed above is reported in sustainability accounts, this is likely overlooked by investors unless reported and managed in the financial balance sheet. However, investors need consistency in the measurement and treatment of these forms of investment to allow comparability. The widespread adoption of this method would improve communications around natural capital with mainstream investors.

There are also alternative means of reporting on natural capital investments through better information in corporate accounting/reporting approaches internally and externally. Internally this would include managerial accounting and auditing committees responsible for a final say on the investment. Externally, this could include clearer disclosure by businesses of investments, improvements in narrative reporting, and directed communication to key investors.

5. Next steps

This method serves to increase the visibility of natural capital accounting practices in the financial balance sheet today. It would help change corporate perspectives on how investments into natural capital are perceived and provides some incremental information (beyond current reporting). However, it is only intended as an interim step towards more complete integration of companies' natural capital impacts and dependencies.

Other actions that could be undertaken within existing accounting standards are outlined in the main summary report. Of particular note is the need for a wider study to assess the gaps in the current accounting standards to identify differences before determining where harmonization could be proposed or additional disclosure would be appropriate. For example, this could be completed in conjunction with the results from the Financial Reporting Council (FRC) work on *Business Reporting of Intangibles: Realistic Proposals a Discussion Paper* (FRC, 2019), which focused more on financial accounting.

This provides an accessible approach to help the process of integrating natural capital accounting practices into financial accounting practices. Specific recommendations include:

- Provide guidance on the application of IAS 38 and (potentially) write to the accounting standards Interpretations Committee to request clarification on the standards, particularly around the criteria for control and economic benefits.[16]
- Develop a study to build consensus around the implementation of accounting practices for intangibles and natural capital accounting. This could be developed in line with the Financial Reporting Council (FRC) work, assessing across all of the different accounting standards the gaps in the application of intangibles (particularly as it relates to natural capital investments) and could also explore the application of IAS 38 more widely.
- Call for action by the International Accounting Standards Board (IASB), national standard setters, and regulators to ensure that companies are applying the standards correctly.
- Engage with the IASB to consider revising IAS 38, such as relaxing the requirements/criteria for capitalization of the investments. This would require some level of consensus on the application on IAS 38.

[16] See: https://www.ifrs.org/supporting-implementation/how-the-ifrs-interpretations-committee-helps-implementation/

Annex B – Value Added Statement for Nature

1. Overview

Following the logic of value added, Annex B elaborates a proposal to reshape the format of the income statement to show how much of the value generated by companies is "given back" to nature. The method highlights the dynamic tension between the destruction and restoration of natural resources in the production process.

To collect initial data and provide a numerical example of how a Value Added Statement could look in practice, data from current valued-added reporting practices among German corporations (data anonymized and company names removed) have been used. The proposed methodology calls for relatively small but impactful changes to the current financial reporting framework in order to operationalize the concept of Value Added for Nature by introducing a "Provision for Nature" line in the income statement and a related "Fund for Nature" in the balance sheet.

2. Context

Calls to place sustainability on a business's overall agenda are not new (Schubert and La´ng, 2001; Keeble, 1988). In both the field of financial reporting and the younger domain of sustainability reporting, considerable progress has been made. More recently, Ernst & Young (EY) fourth survey of institutional investors reveals that integrated reports have emerged as a preferred source of ESG information. The survey documents that although there is an optimistic sentiment about the ability of firms to assess ESG materiality, this ability is considered much weaker in firms' assessment of environmental factors compared to governance or social factors. Against this backdrop, it is timely to investigate how a deeper integration between financial and sustainability reporting can be achieved more effectively.

The current format of the income statement is designed to satisfy the information needs of a very specific stakeholder: the shareholders. It originates from the first industrial revolution and signals the distinction between functional managers (manufacturing, administrative, finance) and shareholders, who delegate to them the management of the firm. Such a format was not originally designed for wider external reporting but as a tool for shareholders to control functional managers' conduct and the efficiency of each production function. As a result, this format ignores the social dimension of the production and distribution of value as it assumes, for instance, that salaries are costs to be reduced not production factors to be remunerated. It creates a hierarchical order among the various production factors, where the remuneration of capital is the residual but most important resource, thus not granting the same status to other production factors, such as labor or land. Capital therefore enjoys a unique position in the remuneration rank order. Similarly, natural resources are seen as a cost (e.g., raw material) but not as a production factor to be remunerated or reintegrated in the same guise of capital or labor. Natural resources are treated simply as costs with a negative impact on the bottom line.

The logic of value added is not alien to financial reporting. In Italy proposals for a *Bilancio Sociale* (a social financial report) were popular in the eighties (see Vermiglio, 1984). The IV EU directive and subsequent International Accounting Standards (IAS) 1 allowed the classification of income statement items by nature (e.g., salaries, not only function; general and administrative (G&A) expenses) to allow calculation of the production and distribution of value added. National accounts are normally calculated with the value added logic, some corporations under state influence (e.g., Istututo per la Ricostruzione Industriale (IRI) and ENI) have produced plans and budget according to value added (Quattrone et al., 2019), and currently in Latin America various corporations are experimenting with using value added to account for social and environmental issues (Perera

et al., 2012). The method described in Annex B revisits and draws on these experiences to operationalize the notion of Value Added for Nature by introducing a “Provision for Nature” line in the income statement and a related “Fund for Nature” in the balance sheet.

2.1 Links to current accounting practices

This method does not fundamentally alter the calculation of various cost or revenue items under current accounting rules but requires the calculation of a new provision and related fund that does not currently exist. This provision has the objective of altering behavior of companies rather than providing a “true and fair view” of financial transaction. In this sense, the method proposes a new Provision for Nature (in the income statement) and relative Fund for Nature (in the balance sheet), to provide a space for debating the environmental policies of the company and relative long-term investment policies to reconstitute natural capital and alter attitude towards, and behavior in relation to, environmental issues. This would also encourage firms to work towards a zero-net impact when producing goods and services.

The method uses a combination of available environmental data and expert judgment, and so does not pose particularly significant incremental costs related to data collection. The method also utilizes to a large extent current accounting and regulatory infrastructures for financial reporting purposes.

Value added statements represent an alternative approach to the conventional reductionist notion of profitability. Such statements are grounded upon the inclusive and open-ended notion of value added that can reconcile business, societal, and natural values into one institutional and calculative space (i.e., the income statement and balance sheet accounts). Our proposal aims to expand the value added logic to nature, by making nature a stakeholder to be remunerated in the same way in which capital and labor are.

The method potentially internalizes the environmental externalities related to the production and distribution of economic value.

2.2 Links to natural capital accounting practices

Given the pivotal role of the firm as the main driver of the economy, the logic of the Value Added Statement for Nature acknowledges that environmental matters need to be considered by a business as one of the main drivers of natural resource consumption and production of economic value.

The Value Added Statement for Nature highlights that firms are the appropriate place where negotiations and compromises happen in relation to social and environmental values. Such statements function in linking business actions to societal impacts by encouraging the narrow shareholder group to reflect on what kind of societal and environmental futures a firm is contributing to make. This realization also dovetails with the main aim of this project that financial and natural capital reporting (together with other capitals) become more integrated.

The notion of value added reflects both the impacts and dependencies of a business on natural capital, as it shows a fuller picture of how environmental issues can be distilled from income statements (describing “flows” of resources) and how changes in flows of positive and negative income can feed into balance sheets (the “stock” of capital). However, being an expansion of conventional financial statements, it implies that the notion of value added may not completely capture the multifaceted dependencies of a business on natural capital, and further efforts to expand the scope of natural capital captured in such a reporting framework are needed.

The valuation method for natural capital within this framework does not preclude the use of either market, cost, or non-market data for calculating value added. To the extent that data are captured by internal management accounting systems (e.g., cost and R&D data) and market-to-market measures (e.g., manufacturing costs), they could be relevant to achieving the objective of reflecting the value/provision for nature.

3. Results

This section includes a case study applying the Value Added Statement for Nature method, including relative numerical calculations followed by a brief discussion.

We have gathered publicly available financial reporting data from selected German companies, as some of them provide Value Added Statements (VAS) which reclassify items in the income statement prepared according to International Financial Reporting Standards (IFRS) principles into a Value Added report. The data collection exercise could also be extended to historical examples where reporting format by nature were admitted under the IV EU Directive on financial reporting and the initial formulation of the International Accounting Standard (IAS) 1.

Tables B1 and B2 illustrate the financial reports of an anonymized large German corporation.

Table B1. Income Statements for Group

in EUR million	2018
Revenues	77,984.00
Cost of sales	-63,139.20
Gross profit	**14,844.80**
Selling and administrative expenses	-7,646.40
Other operating income	619.20
Other operating expenses	-520.80
Profit / loss before financial result	**7,296.80**
Financial result	555.20
Profit / loss before tax	**7,852.00**
Income taxes	-2,060.00
Profit / loss from continuing operations	**5,792.00**
Loss from discontinued operations	-26.40
Net profit / loss	**5,765.60**

Table B2. Group Balance Sheet at 31 December 2018 (in EUR million)

Assets		Equity and liabilities	
Non-current assets	100,353.60	Subscribed capital	526.40
Current assets	66,830.40	Capital reserves	1,694.40
		Revenue reserves	44,896.80
		Accumulated other equity	-1,070.40
		Equity attributable to shareholders	46,047.20
		Minority interest	423.20
		Equity	46,470.40
		Pension provisions	1,864.00
		Other provisions	4,620.80
		Deferred tax	1,444.80
		Financial liabilities	51,817.60
		Other liabilities	4,239.20
		Non-current provisions and liabilities	63,986.40
		Current provisions and liabilities	56,727.20
Total assets	**167,184.00**	**Total equity and liabilities**	**167,184.00**

Table B3 illustrates the value added statement of the same company (as published, data disguised), which reclassifies cost and revenue items to fit into a value added statement.

Table B3. Value Added Statement

	2018 in EUR million
VALUE PRODUCED	
Revenues	77,984.00
Financial income	791.20
Other income	619.20
Total output	**79,394.40**
Cost of materials	42,505.60
Other expenses	10,339.20
Bought-in costs	**52,844.80**
Gross Value Added	**26,549.60**
Depreciation and amortization of total tangible, intangible, and investment assets	6,752.80
Net Value Added	**19,796.80**
VALUE DISTRIBUTED	
Employees	9,983.20
Providers of finance (non-equity)	1,826.40
Government/Public sector	2,221.60
Shareholders	1,842.40
Group	3,851.20
Minority interests	72.00
Net Value Added	**19,796.80**

=5,765.60 (net)

What follows takes these statements as basis for further elaborations that show how Value Added for Nature could be calculated and operationalized in practice.

3.1 Towards a Value Added Statement for Nature

The method is designed around a Provision for Nature in the income statement which is to constitute a Fund for Nature in the balance sheet. The rationale for this proposal is that as much as companies have provisions for various kinds of risks they could have a provision for a fund to be subsequently used for environmental investments (e.g., installing solar panels; improving the treatment of water polluted by industrial manufacturing processes, restoring natural resources such as trees). In such a way, the company would remunerate nature, conceived as a production factor consumed in the production of economic value, in the same guise of labor and capital.

We do not prescribe any fixed methodology for deciding the amount of this provision for nature. This is intentional, as the purpose of the Provision for Nature is to open discussion on how ecologically responsible various stakeholders and the company aim to be. As much as firms have discretion in determining how much dividend to distribute, this approach gives firms and their stakeholders the discretion to determine how much value they would like to attach to the natural environment and resources they and their company have consumed in the production of economic value.

Similar to the way that shareholders punish companies for holding onto too much cash and distributing too little, companies that are not adequately providing for nature would be penalized by an increasingly ESG-aware investor community as well as the broader stakeholders group. It is noteworthy that transparency in disclosing how a provision number is reached by the reporting entity is crucial, as much as the debate when discussing the financial reports in the general assembly.

The value of this provision can theoretically be zero, as can the value of the corresponding fund. This would signal either a low level of attention devoted to environmental issues, or that the company considers its overall impact on nature to be neutral or net positive in the accounting period. Further work is required to frame the calculation of the Provision for Nature, but there are multiple examples of businesses calculating the value of their net impact on nature, either in relation to positive and negative impacts in their value chain (e.g., Kering (2017) or in terms of the value of natural capital assets (e.g., Forest Enterprise England (2019).

Despite not providing detailed methodologies, a potential scenario and its impact on accounts is demonstrated below to illustrate the potential magnitude of the numerical changes. A provision that equals 10% of current value added has been assumed and its effect on the distribution of value added to other stakeholders is illustrated.

The income statement would assume the format of a value added income statement (adjusting the value added income statement in Table B3) and is shown in Table B4. The adjusted balance sheet is also illustrated in Table B5.

This proposal also entails a provision for a Fund for Nature in the balance sheet, with the same approach companies follow when booking provisions for various other risks. This provision is not to be considered as an operating expense but as a form of distribution of the overall value created by the company through its production process. The Fund for Nature is to be considered as a liability, for it is a debit towards the nature that needs to be eventually repaid. Its use could be decided by a company's stakeholders (not only shareholders) on a collective basis (e.g., using on-line voting systems).

Table B4. Adjusted Value Added Income Statement under the Value Added Statement for Nature Method

	2018 in EUR million	
VALUE PRODUCED		
Revenues	77,984.00	
Financial income	791.20	
Other income	619.20	
Total output	79,394.40	
	0.00	
Cost of materials	42,505.60	
Other expenses	10,339.20	
Bought-in costs	52,844.80	
Gross Value Added	26,549.60	
Depreciation and amortization of total tangible, intangible, and investment assets	6,752.80	
Net Value Added	19,796.80	
VALUE DISTRIBUTED	0.00	
Provision for Nature	1,979.68	10.00%
Employees	8,984.88	45.39%
Providers of finance (non-equity)	1,643.76	8.30%
Government/Public sector	1,999.44	10.10%
Shareholders	1,658.16	8.38%
Group	3,466.08	17.51%
Minority interests	64.80	0.33%
Net Value Added	19,796.80	

Table B5. Adjusted Balance Sheet under the Value Added Statement for Nature Method (in EUR million)

Assets		Equity and liabilities	
Non-current assets	100,353.60	Subscribed capital	526.40
Current assets	66,830.40	Capital reserves	1,694.40
		Revenue reserves - original	44,896.80
		Adjustment: Provisions for Nature	-1,979.68
		Revenue reserves - adjusted	42,917.12
		Accumulated other equity	-1,070.40
		Equity attributable to shareholders	**44,067.52**
		Minority interest	423.20
		Equity	**44,490.72**
		Pension provisions	1,864.00
		Fund for nature	1,979.68
		Other provisions	4,620.80
		Deferred tax	1,444.80
		Financial liabilities	51,817.60
		Other liabilities	4,239.20
		Non-current provisions and liabilities	65,966.08
		Current provisions and liabilities	56,727.20
Total assets	**167,184.00**	**Total equity and liabilities**	**167,184.00**

3.2 Discussion

The Value Added Statement for Nature represents a significant change to current reporting practices. It considerably improves the visibility of a business's assessment of its impacts and dependencies on the wider natural environment. The approach provides adequate flexibility for standard setters to frame the value for nature as either costs, provisions, or tax. The method would require further work to frame the valuation of the provision.

This work can build on the principles and methods described in the Natural Capital Protocol and some progress on natural capital applications (such as Kering (2017) and Forestry England (2019).

Table B6 provides an overview on main pros and cons of this method.

Table B6. Pros and cons of the Value Added Statement for Nature Method

Pros	Cons
• Technically relatively simple • Low cost of implementation • Significant impact on behavior • Empowers stakeholders in debating and pursuing an environmental strategy • Offers a space for discussion of various stakeholders' attention to environmental issues	• Requires change in accounting culture and practices due to the existence of the provision and treatment of the fund • Requires collective action and possibly a change in governance rules

4. Methodology in practice

The EC (2019) acknowledges that the scale of the investment challenge involved in sustainable finance is beyond the capacity of the public sector alone. The financial sector has a key role to play in reaching these goals. Further improvements in integrated reporting are crucial in integrating the private sector and wider stakeholders in the EC's Sustainable Finance Action Plan. Above all, better reporting on natural capital can reorient investments towards more sustainable technologies and businesses. In addition, Value Added for Nature can redirect finance consistently to growth in a sustainable manner over the long run. Moreover, this framework highlights that a low-carbon, climate-resilient, and circular economy should be based on an explicit recognition of value for nature and an institutionalized provision for nature.

4.1 Innovation

The Value Added for Nature method utilizes monetary measures (either as costs, provisions, or taxes and their subsequent use) to give visibility to how an organization and its members deal with environmental issues, which are intrinsically difficult to represent and require serious attention. By so doing, the method links environmental issues to concrete financial issues (be they related to the quantum of the provision, fund, or related expense), facilitates the incorporation of environmental issues into financial statements, and reduces the implementation burden of reporting entities.

This method recognizes the value of nature and the need to consider it as an integral part of the production of economic value and not as an externality. Yet the controversies over how to distribute value among shareholders, employees, the state, and nature are made explicit and the Value Added Statement for Nature constitutes the space where the required negotiations and compromises among stakeholders happen.

In summation, a framework based on value added encourages compromises:

- between humans (who exploit natural resources) and nature (which provides human with such resources)
- between profitability (which is currently defined by narrow corporate objectives) and sustainability (which represents wider societal interests)

4.2 Application

The method works on the basis of double-entry bookkeeping. Unlike other sustainability reporting initiatives which require the definition and implementation of new metrics beyond the financial ones, this method integrates sustainability issues in the current method of calculating economic value. In this sense, after careful experimentation, the method is scalable, if adequately supported and sponsored by policy bodies.

The method, given its integration with current double-entry bookkeeping, is also easily applicable to various geographical, business, and industry contexts. This is also due to the minimal regulation involved in the definition of the provision and its subsequent use, the suitability of which is left to the market and various stakeholders to assess.

The method would not require additional data from those already available to firms, and the regulation required to adopt the method is minimal as it would imply only the change of the reporting format and the full disclosure of the valuations involved.

4.3 Other aspects

In the context of this case study, a value added framework not only improves visibility of the consumption and formation of natural capital, it also helps make visible the managerial philosophy and the negotiations

between management and wider stakeholders in relation to environmental issues. This aspect is especially important in an industry featuring high environmental risks.

The notorious emissions scandal wiped out a third of VW's value and posed a threat not only to the reputation of individual companies but also to the German economy (Topham, 2015). If value added thinking were in place and an entity's attitude towards nature (e.g., how much the entity is willing to provide for nature or an environmental fund) were made visible, investors and the competent regulators would be able to identify such potential risks in a timelier manner. Value Added Statements, as a demonstration of an entity's overall relationship to nature, can thus function as an early warning signal of potential environmental risks.

If the proposed method were institutionalized through regulation, it could readily enter into concerns of the public and auditing considerations. As shown in the numerical example, the Value Added Statement for Nature is easy to visualize and conveys clear and intuitive information to a wide range of audiences. This feature of the method can potential facilitate policy innovation in the field of natural capital protection.

5. Next steps

Concluding points on next steps:

- To mitigate the risk of management biases and impression management, the framework could be accompanied with disclosure requirements to enhance transparency and trust in the numbers, especially in relation to the use of the Fund for Nature. Disclosures could include calculation methodologies employed by the reporting entity, data sources, and key assumptions made, building on the principles and methods presented in the Natural Capital Protocol. Such disclosures are not only a device for auditing and accountability, but also an explicit expression of how an entity perceives its relationship with nature.
- It is important to recognize that this framework provides only one indicator of the value of nature. Just like no single indicator can forecast a financial crisis, the value added approach proposed should also be used in benchmark exercises organized by industry, country, etc.

Annex C – Comprehensive Accounting in Respect of Ecology (CARE) Model

1. Overview

CARE (Comprehensive Accounting in Respect of Ecology)[17] is a direct extension of historical cost accounting and its principles. Schematically, the CARE model is based on:

- an inclusion of social and environmental issues in the balance sheet and income statement;
- an extension of financial solvency to environmental and social solvency;
- an extension of the principles of protection of financial capital to natural and social/human capital*s*;

The income in CARE is the surplus of revenues after all the capitals have been maintained (preserved).

In broad outline, CARE is a "natural" extension of the concept of liabilities, assets, expenses, revenues, and income in line with historical cost accounting theory. For these reasons, CARE is adaptable to *the structure and theory* of most *national* financial accounting standards (like French GAAP), but with a need for in-depth evolution of these (in particular, to include new types of liabilities and assets) (see part 3.3.2 of Annex C).

Natural, social and human capital, conceived as liabilities, are valued at their preservation costs (prevention or restoration, not compensation, costs). Assets are uses of capitals (financial, natural, and social).

To be fully operational, CARE ultimately needs to be articulated with an "ecosystem-centered accounting" model that accounts for the ecological performances reached at the level of the collective management of a given natural capital entity.

Most results of the ongoing experiments using the CARE method cannot be reported to respect confidentiality. This report draws from these real cases to provide schematic examples.

2. Context

CARE was introduced in Richard (2012) and developed in particular in Rambaud & Richard (2015b), Rambaud (2015), and Richard, Bensadon, & Rambaud (2018). It is part of an ongoing research and development program (Richard et al., 2018) involving academics, business, and civil society, at the interface between management sciences, economics, environmental sciences, sociology, and history.

At the development level, various phases of the model's progress have been tested and are being tested through consulting firms and associations:

- The Research and Development (R&D) section of the consulting firm "Compta Durable"[18] is dedicated to this model. From 2016 to 2018, the firm experimented with a previous version of CARE in a nursery company, a real estate company, and a farm. Since April 2019, this firm has been conducting an

[17] The term "ecology" in the acronym CARE should not be interpreted as a synonym of "environmentalism," but taken in the term's initial and fundamental meaning: the interrelations of humans and non-human entities, in which we include all living conditions in a broad sense. Therefore "ecology" encompasses social and natural concepts as entangled issues.

[18] http://www.compta-durable.com/

experiment (Collective Operation) of the last version of CARE, involving ten companies (in different sectors, industrial, distribution, etc., and ranging from small and medium enterprises to multinationals) in the south of France, in partnership with the French environment and energy management agency (ADEME)[19] and the French Circular Economy Institute (INEC),[20] with the support of the Haut-commissaire à l'Économie Sociale et Solidaire et à l'Innovation Sociale[21] (attached to the French Ministry of Environment).

- The principles of CARE are used by the "Fermes d'Avenir"[22] network as a basis for their advocacy for "triple capital" (or rather "multi-capital") accounting.
- A previous version of CARE was tested in the "Bergerie Nationale,"[23] in the framework of a PhD thesis (Altukhova, 2013); this experiment is being updated.

At the academic level, several research projects[24] and research chairs, including one entitled Ecological Accounting[25] (AgroParisTech, Paris-Dauphine University, University of Reims-Champagne-Ardenne/LVMH, "Compta Durable", Association of Chartered Accountants of Paris-Ile de France, CDC Biodiversité),[26] collaborate in theorizing and developing the model and its socioeconomic consequences. CARE is also taught (and will be taught) in some training courses (Paris-Dauphine University, AgroParisTech, Kedge Business School). In this context, several PhD theses deal with CARE in various fields (in particular, in agricultural and distribution sectors) (Altukhova, 2013; Ionescu, 2016; Rambaud, 2015; Taibi, 2019).

At an institutional level, CARE is included in several reports (De Cambourg, Gardes, & Viard, 2019; Finance Watch, 2019; Notat & Senard, 2018; WWF France & AXA, 2019) and is the subject of a number of recommendations (Rambaud & Richard, 2016), notably from the French Economic, Social and Environmental Council (Abel & Blanc, 2017; Pasquier, 2018), while also contributing to debates within organizations such as the French Society of Financial Analysts, the French Association of Chartered Accountants, the French accounting standard setter, and the French Ministry of Environment.

CARE was created to address the following gaps in the current financial accounting approach:

- Lack of dedicated accounts for environmental and social issues;
- Failure to articulate financial and non-financial data as well as financial and socio-environmental impacts;
- Lack of environmental and social (scientific) objectives, including in the case of provisions;
- Lack of emphasis on investments for an ecological transition and on environmental and social expenditures (to prevent and restore);
- No distinction between operating activities and activities to reduce or avoid negative socio-environmental impacts;
- Asymmetry of treatment between financial, environmental, and social issues, contrary to the demands of sustainable development. Moreover, today's integration of some non-financial information is conceived mainly from the perspective of the (negative and positive) impacts of (natural and social)

[19] https://www.ademe.fr/
[20] https://institut-economie-circulaire.fr/
[21] https://www.ecologique-solidaire.gouv.fr/ministere/haut-commissaire-leconomie-sociale-et-solidaire-et-linnovation-sociale
[22] https://fermesdavenir.org/
[23] French National Sheep-fold - http://www.bergerie-nationale.educagri.fr/
[24] With funding from Institut Europlace de Finance, Louis Bachelier Institute and the "Autorité des Normes Comptables" (French accounting standard setter).
[25] Inaugurated in presence of the president of the French accounting standard setter, of the French High Commissioner for the Social and Solidarity Economy and of the Director General of the European Commission's Directorate General (DG) for Environment. They intervened to support this initiative.
[26] https://www.cdc-biodiversite.fr/ (CDC: French public company "Caisse des Dépôts et des Consignations")

environment on business, and not from the impacts of business on the (natural and social) environment;
- Lack of shared governance with stakeholders: financial accounting does not really serve the public interest (especially for IFRS);
- Lack of fully integrated performance: this situation leads to separating financial and non-financial analyses/notations;
- Lack of consideration of longer time periods; prevalence (in particular, in the case of IFRS) of short-term values.

2.1 Links to current accounting practices

As a consequence of these gaps, current measured profit/profitability may not be sustainable, but made at the expense of "capital" (natural and human) "entities" to be preserved. Moreover, as explained below, some of these issues are also present in some current proposals of integrated reporting or environmental extension of financial accounting.

To address these issues, CARE is firstly based on an analysis of the notion of "capital" and its implications in the non-financial context. Broadly speaking, there are two opposite interpretations of the concept of (financial) capital, which accounting is able to distinguish. "Capital" is (Finance Watch, 2019; Rambaud, 2017; Rambaud & Richard, 2015a):

1. Model 1: either "money to be repaid," disconnected from the notion of interest. From this perspective, in accounting, capital is a credit concept (Nobes, 2015), and corresponds to liabilities (including to owners/shareholders). Assets, as a consequence, are "uses of capital."[27] Model 1 is the conceptual basis of historical cost accounting and thus of the CARE model.
2. Model 2: a set of productive resources or a productive fund, generating, through its control, money or services. In this context, a machine, for instance, can be "capital." In this way, money is not capital, but it is productive money (money's worth) that is "capital." According to this view, in accounting, capital is a debit concept (Nobes, 2015), defined as net assets and refers only to owners/shareholders. Model 2 is the conceptual basis of fair value accounting.

The first conception corresponds to the historical origin of the term "capital": capital is etymologically the main, the *capital*, part of a debt, the part to be repaid/preserved over time, regardless of any interest (Braudel, 1992).

These two interpretations[28] also have important consequences for the concept of "non-financial capital."

2.2 Links to natural capital accounting practices

2.2.1 Natural and human capital as "assets" (extension of Model 2)

An extension of Model 2[29] leads to an understanding of "non-financial capital" as a set of non-financial productive resources (non-financial assets) that generate money and services, in particular, for owners/shareholders in the context of a company (Rambaud, 2017). More precisely, natural or human/social capital correspond to specific natural or human/social features, able to produce money and services, like pollution absorption, pollination, etc. or knowledge, skills, etc. Therefore, natural capital or human capital is not, for instance, a given ecosystem, *per se* – a particular biophysical and complex entity – or a human being

[27] e.g., a machine is not an asset, according to Model 1, but it is the "purchase of this machine" which corresponds to the "real" asset (Ijiri, 1967).
[28] We do not discuss here the consequences of these two approaches on financial accounting. Cf. (Finance Watch, 2019) for such a discussion, in particular about the issue on volatility.
[29] Which is at the core of the <IR> (Integrated Reporting of International Integrated Reporting Council (IIRC Council, 2013)) or of the environmental P&L of Kering.

per se, but only the recognition that "capital" can have other sources of productivity (natural and human assets). In this way, nature and human beings are mere means for increasing "capital" (value). Reporting natural and human capital can simply lead to a reporting of immaterial assets (natural and human assets), which constitute a part/an explanation of the *internally generated goodwill*.

From this perspective, the value of natural or human capital is based either on market values, extended to virtual market values assessed by consumer's willingness-to-pay or willingness-to-accept for natural assets or on discounted future free cash-flows generated by natural or human assets.

Furthermore, from this perspective, the levels of preservation of natural entities, like biodiversity, plant and animal populations, or climate, are *the result of a cost-benefit analysis*, including the value of natural and human capital eventually lost. Perhaps paradoxically, this approach systematically leads to environmental degradation (Clark, 1973; Godard, 2004; Pearce, 1976). For instance, Pearce (1976) proved that the optimum production, even with an internalization of (positive and negative) externalities in the cost-benefit analysis, is always beyond the regeneration capacities of the exploited ecosystems.

2.2.2 Natural and human capital as "liabilities" (extension of Model 1)

Sustainable development, from a strong sustainability perspective (Dedeurwaerdere, 2014; Holland, 1997), involves the preservation or conservation of some natural and human entities, in their materiality and their complexity. More clearly, it requires levels of preservation, determined scientifically and collectively, that constitute the framework within which the economy and accounting must operate. With this aim in mind, *a* natural capital and *a* human capital can be interpreted through an extension of Model 1, as "capital" things to be "refunded" or preserved over time.

This interpretation represents the basis of CARE and of its associated R&D program.

2.2.3 Principles of CARE: Ecological/Sustainable Historical Cost Accounting

The principles of CARE can be summarized as follows (this report focuses on natural issues, though the same reasoning is applied for human and social issues (Rambaud & Richard, 2015b, 2017):

a) Conceptualizing natural "entities"[30] (or at least part of them) used, directly or indirectly, by a company as "capital" in the sense defined in Section 2.2.2 of Annex C, so as "liabilities", and not as resources or assets. It is therefore a question of treating them as real liabilities and not as mere means. Moving to a "liabilities" logic makes it possible to conceive of the uses made of natural entities as a "loan", a kind of "social and ecological debt", which it is necessary to be able to "repay": the preservation of natural entities used thus becomes a basis for the company's activity, in accordance with the classic accounting logic of preservation of financial capital. Thus, financial solvency – the company's central performance, which measures its ability to meet its obligations (i.e., financial liabilities) is complemented by "natural" solvency. From this perspective, these capitals are "matters of concerns" and preserving/maintaining them requires the most accurate investigation into their nature, complexity, and levels of conservation.

b) Conceiving (natural) assets as the different types of uses of natural capitals, in line with Table C1 (first column). Again, this point is consistent with the classic accounting logic (Model 1). This type of reporting makes it possible, as is currently the case in the balance sheet, to scrupulously detail the uses (e.g., repeated/fixed or current uses) of natural entities (capitals). For instance, in the case of a farm, a soil-as-

[30] Biodiversity, soil-as-ecosystem, river-as-ecosystem, climate, etc.

ecosystem is a “natural capital,” whereas a tree plantation is a (fixed) “natural asset” and wheat cultivation is a (current) “natural asset.”

c) Therefore, considering the income as a surplus beyond the preservation of all the different capitals used by a firm. The accounting income and the revenues appear as a co-creation of value through the uses of all capitals, which collectively contributes to this creation of value.

d) Evaluating capitals through the costs of their preservation over time. More precisely, let us consider a natural capital (for instance, a river-as-ecosystem). The levels of its preservation are determined upstream, scientifically and collectively. Before its uses by a given business, processes of preservation (prevention or restoration, not compensation) must be planned over a relevant period of time to ensure the conservation of the considered capital. The (undiscounted) sum of the costs of these processes is the value of this capital at the beginning of its use: it is thus a budgeted value.

e) Evaluating assets (i.e., uses of given capitals) on the basis of the share of the preservation costs (see point d) of the used capitals, because of these uses. Thus, the more a given use degrades a given capital, the higher the value of this use, and therefore of this asset, will be (i.e., the cost of preserving the capital, generated by this use).

The recognition of an entity as a “capital”, and the operationalization of this notion, is one of the central elements of the CARE model. To this end, CARE needs to be articulated with an “ecosystem-centered accounting” model (see Section 3.3.2 of Annex C).

Figures C1 and C2 show the generic balance sheet and income statement of CARE (only for financial and natural capitals) (Richard et al., 2018).

Figure C1: CARE Balance Sheet

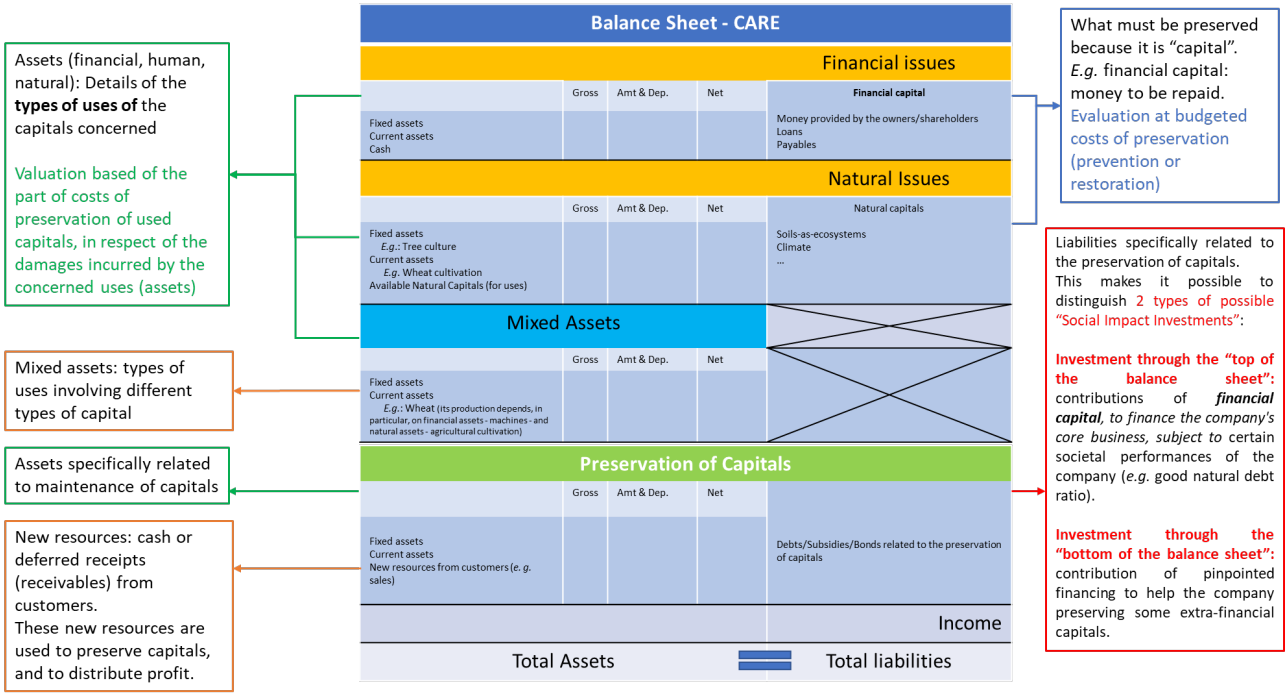
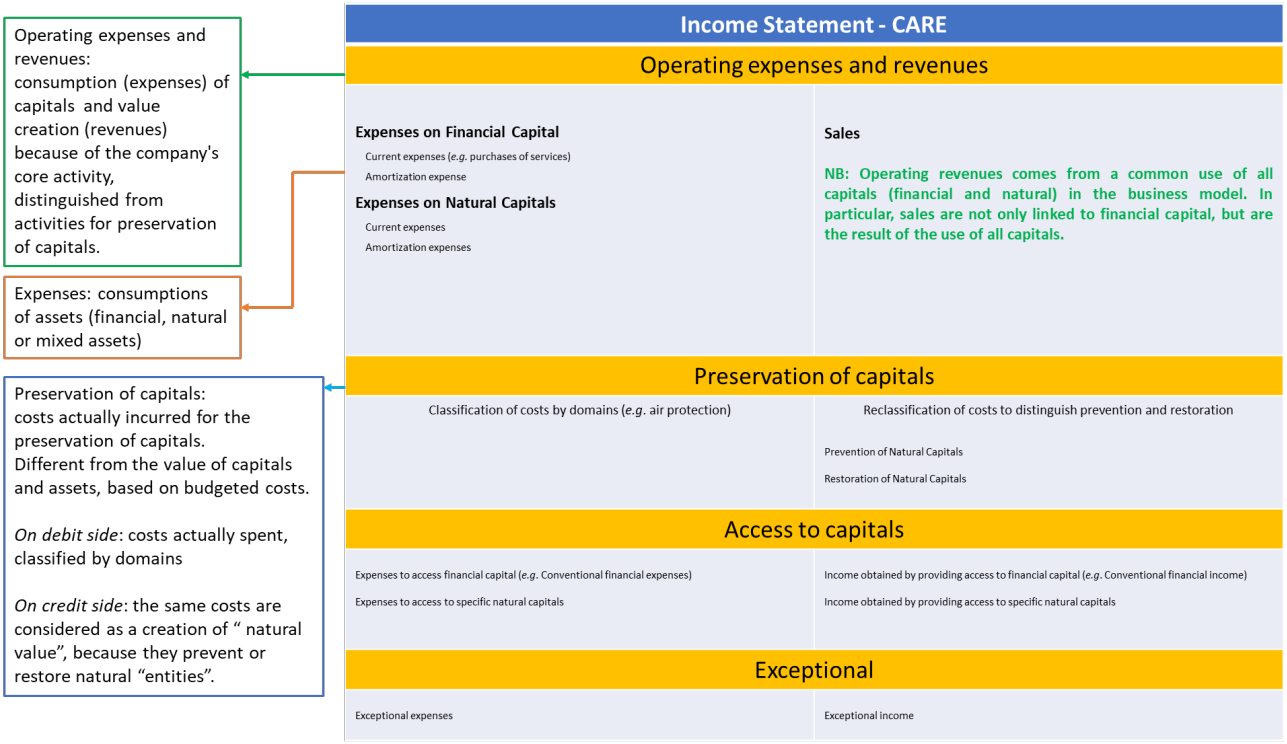


Figure C2: CARE Income Statement



3. Results

Through different examples and stylized case studies, several characteristics, uses, and implementations of CARE are presented. As explained before, most of the results of the ongoing experiments of CARE cannot be reported to respect confidentiality. Here, we draw from these real cases to provide schematic examples (all located in France), to deepen the understanding and application of the model.

3.1 Case Study 1: Simplified example of the use of the balance sheet and income statement under the CARE model

This simplified example shows the balance sheet and income statement under the CARE model in the case of a farm of apples and wheat. The detailed example can be found on the site of the "Ecological Accounting" chair[31]. The soil is the natural capital that needs to be preserved in this case. The following account shows the income statement of the farm for a specific year, providing better visibility to natural capital by inclusion of: (i) natural capital operating expenses and (ii) soil preservation expenses.

[31] https://www.chaire-comptabilite-ecologique.fr/publications/

Table C1. Income Statement of the farm application under the CARE model (in thousand EUR)

Operating expenses and revenues			
Expenses on financial capital			
Amortization expenses (tractor)	50		
Expenses on natural capital			
Current expenses	50		
Amortization expenses (tree plantation)	150		
Preservation of capitals			
Preservation of soil	145	Restoration (ex post preservation)	145

Table C2 shows the balance sheet of the farm with the new additions of the CARE model, including: (i) explicit information about amortization and depreciation of assets and (ii) an explicit distinction of different types of issues (financial and natural) and (iii) the articulation between (natural and financial) capitals (liabilities) and (financial, natural, and mixed) assets and (iii) the preservation of capitals.

Table C2. Balance Sheet of the farm application under the CARE model (in thousand EUR)

Financial issues					
	Gross	**Amortization and Depreciation**	**Net**		
Fixed assets[32]				Financial capital	1500
Field	1000	0	1000		
Tractor	500	50	450		
		Natural issues			
Fixed assets[33]					
Tree plantation	450	150	300	Soil (natural capital)	355
Current assets[2]					
Wheat cultivation			0		
Finished goods (apples)			75		
Mixed assets[34]					
Finished goods (wheat)			50		
Preservation of capitals					
New resources (from sales)			15	Grant	60
				Income	**-25**

It can be noted that the choice of actual restoration costs (145 in income statement) does not affect the income. This one is only based on the budgeted costs. The fact that the result is negative therefore means that the company does not generate enough turnover to cover the necessary restoration costs.

Actual expenditures on restoration costs, on the other hand, affect the level of environmental debt (natural capital) and, more importantly, the gap between environmental liabilities and assets. In absolute terms, a

[32] Financial assets i.e., assets as uses of financial capital.
[33] Natural assets, i.e., assets as uses of natural capital (soil here).
[34] Mixed assets: uses of different capitals (financial and natural capitals here).

company that really spends nothing on preservation actions would ultimately have a fixed debt for a zero asset.

3.2 Case Study 2: Conception of “capital”

Company: Real estate company (global real estate operator of a French multinational) / experiment on one site.

The company is concerned about water runoff from their buildings and concrete floors. The company wants to integrate the issue of water management into their Corporate Social Responsibility (CSR) approach.

Processing in CARE:
It had to be determined whether there was a “capital” at stake and, if so, what capital. Thus, behind the problem of water flows, it was necessary to define the entity (or entities) which the company cares about and which is degraded through allowing this activity. The answer is “the water cycle at the scale of the company's river basin.” A capital “water cycle” has therefore been created. This allows the company to be part of a more global reflection, at the level of the catchment area. The difficulties generated by this type of approach are:

- A certain lack of collective and scientific standards on the “things” to be preserved and the levels of preservation.
- A lack of appropriate management systems, focused on ecosystems, making it possible to manage "capital" on this scale (see Section 3.3.2 of Annex C).

The CARE model contributes to addressing these issues and helps or incites firms and public policies to design adapted instruments and information systems for ensuring preservation at different scales.

3.3 Case Study 3: Integration of a natural capital in business model

Company: Farm / experiment on one site

The farm, with significant societal commitments, has a livestock activity. Animal welfare is a concern. The case study is focused on sheep.

Processing in CARE:

1) *Identification of the capital at stake*. The first hypothesis was to consider each sheep as a capital, a living being to be preserved in its quality of life. The fact that sheep are raised for their meat in particular led to the abandonment of this idea. The object of concern is not each sheep, but the herd as a whole, which has led to the recognition of a "flock-capital"
2) *Determination of the uses of this capital in the company's activity*. After study, four uses emerged: meat supply (A1), wool supply (A2), animation (A3) (the farm being also an educational farm) and loan (A4) to another company (of a part of the flock) to control grass by grazing. These four uses therefore constitute the four “natural assets” associated with the "capital-flock." This analysis leads to the direct integration into the company's business model of the flock of an aspect that was absent: the four assets are understood as real sources of value creation. It is therefore possible to question the profitability of each use. In addition, the assets meat supply (A1) and animation (A3) are current assets: the use of capital in these two cases can be modified in the short term. The assets wool supply (A2) and loan (A4) are fixed assets: the loan is concluded over a period exceeding one year, while the fact of caring for a sheep herd physiologically obliges them to shear throughout their lives (it is not possible to question this use, unless the quality of life of the sheep is radically challenged).
3) *Determination of the value of the herd capital and related assets (general idea)*. We start from the analysis of uses and their impact on the flock's quality of life. A1, A2, and A3 imply being able to feed and shelter

the flock decently; these total feeding and sheltering costs (C) are allocated between the different uses (C1 for A1, C2 for A2, and C3 for A3 such that C = C1+C2+C3). A1 leads to specific costs (SC1) of stress reduction during transport to slaughter. A2 involves specific costs (SC2) to ensure a comfortable shearing. A3 involves specific costs (SC3) to protect animals from visitors. A4 involves specific preservation costs (SC4) determined by the company that employs and hosts a part of the flock. Broadly speaking, without taking into account temporality, the value of the "capital-flock" is equal, at the moment when it is just beginning to be used, to C (=C1+C2+C3+C4) + SC1+SC2+SC3+SC4. The value of A1 is C1+SC1; that of A2, C2+SC2; that of A3, C3+SC3; that of A4, SC4. The principle of the double entry is thus respected.

It is worth noticing that societal issues correspond to the liabilities side (here, for instance, animal welfare) whereas business issues correspond to the assets side (the way capitals are used in the business model to ensure value creation). The connection between these two issues is made possible by the double-entry principle.

NB: the flock also appears as an asset, as a use of financial capital, because part of it has been purchased. In this case, the value of this flock asset is the purchase cost. This asset does not correspond to a concern for the preservation of the flock beyond maintaining its productivity. The recognition of the flock as liability implies that it becomes more than a simple source of productivity whose conservation is subject to cost-benefit analysis (see Section 1.2 of Annex C) and that the farm's productivity comes mainly from the services provided by the flock, and not by the flock itself, allowing the value creation analysis to be refined.

3.4 Case Study 4: Difference between evaluation of natural capital and costs with environmental impact / Natural debt ratio

Company: Nursery company/ Experiment on one site

The company has High Environmental Quality (HEQ) buildings and wants to promote its low-carbon policy.

Processing in CARE:

1) The capital at stake here is "climate-capital." A first hypothesis was to treat the cost of building construction as part of the costs of preserving (preventing) "capital-climate." However, this is not really about prevention, but about reducing impact. More precisely, the construction of such a building serves as the company's core business and makes it possible to reduce the impact on the climate, and therefore the costs necessary to preserve it.[35] The valuation of capital in CARE is based on the costs necessary to prevent or restore a capital as a result of the activity and does not include costs that reduce negative impacts on a capital. Therefore, the construction of the building is a use of financial capital, aimed at reducing natural debt.
2) *Integrated analysis*. CARE makes an integrated analysis possible (i.e., a joint financial and non-financial analysis). One of the first workable ratios of such an integrated analysis is the natural debt (or natural solvency) ratio equal to R=CN/(CF+CN), where CN refers to all natural capitals and CF, all financial capital (CF+CN therefore constitutes the total value of liabilities, if human/social capitals are not taken into account).

[36] Declared as a legal person in 2017.

The change from a normal building to an HEQ building leads to the following ratio evolution:

- CN decreases, as the impact of the new building reduces the necessary costs of preserving climate capital;
- CF increases because an HEQ building is more expensive (and therefore requires more financial capital) than a normal building.

Both these evolutions have the effect of reducing the natural debt ratio. An HEQ building is therefore classified in CARE as an asset on financial capital, with natural debt reduction.

4. Methodology in practice

As explained, CARE makes it possible to produce fully integrated balance sheet and income statements, aligned with scientifically and collectively determined conservation (including IPCC and IPBES data) and strong sustainability issues. Under these conditions, CARE provides "integrated performances" (solvency, profitability, integrated leverage effects, etc.), which do not separate financial and non-financial aspects and which leads to an integrated analysis of companies. Moreover, combining CARE with an ecosystem-centered accounting model (see part 3.3.2) can allow tracking and assessing in ecological terms the specific contributions brought by a firm to environmental performances and regulatory targets at the ecosystem scale. As a consequence, these integrated analyses can serve as a basis for integrated ratings for a finance oriented towards strong sustainability with real impacts. CARE provides a framework for pinpointing green/sustainable investments (see part 3.1 and Figure C1) and a coherent framework for integrating/accounting for new sustainable financial products and aligning accounting with European taxonomy.

Moreover, CARE reporting is directly compatible with the Directive 2014/95/EU on disclosure of non-financial and diversity information, and with the classification of environmental protection activities (CEPA) of EUROSTAT.

4.1 Innovation

In summary, CARE, and the associated research, R&D, and experimentation program, is based on the observation of a convergence between:

1. the requirements of "strong sustainability," based on scientifically and collectively determined preservation/conservation needs and targets (e.g., respect of a 2°C trajectory for climate; conservation of certain levels of biodiversity; prevention of psychosocial risks, burnout or musculoskeletal problems), and thus on the management of the costs necessary to ensure these preservations;
2. the theoretical principles of traditional accounting, at historical cost, whose purpose is to manage a capital "thing" to be preserved (financial capital, provided directly or indirectly by shareholders, banks, suppliers, etc.), through its uses (assets), its consumptions (expenses), and the revenues that can be realized accordingly.

CARE is therefore an extension of historical cost accounting, whose purpose is to manage several capital entities to be preserved, as defined by strong sustainability in association with financial capital, through their joint uses, common consumptions, and the revenues that can be realized accordingly, and through the management of preservation and operating costs.

Under these conditions, all capitals in CARE are treated symmetrically. In addition, the extra-financial and financial aspects are directly linked and associated to socio-environmental scientific objectives.

CARE articulates in the business model, through the double-entry principle, societal demands, represented on the liabilities side (preservation of capital entities) and organizational needs for profitability/operation, represented on the assets side, designed as uses of the liabilities.

4.2 Application

CARE is adaptable to any type of business sector, as shown by its various past and present experiments. Furthermore, this model was thought to be capable of standardization.

In practice, the application of CARE in a firm requires:

- its active involvement in:
    - a discussion on – or an evolution of – its business model;
    - the identification and framing of ecological (and social) issues to be taken into account and addressed;
- an articulation with context-specific ecosystem management systems (see part 3.3.2).

For instance, in the case of the "Collective Operation" (see parts 1 and 2) in the south of France, this implementation needs a one-day theoretical training in this model and four one-day workshops, bringing together at least representatives of the financial, accounting, and CSR departments of the companies concerned, plus specific work from companies between each workshop. The planned implementation period in this case is approximately nine months.

Under these conditions, CARE can also be used to detect gaps in terms of data and concrete measures to ensure the strong sustainability of an organization.

For its standardization, CARE requires some evolution in the current legal structures – in terms of natural and social protections – in social and environmental data collection as well as in ecosystems management (see part 3.3.2). Nevertheless, this type of evolution is directly related to those observed in social and environmental law and in the current awareness on sustainability issues: the French law on biodiversity, the case of Whanganui River in New Zealand[36] (Sanders, 2017), or of Lake Erie in the US,[37][38] to mention only a few examples, show a change of the law/mindset towards a recognition of new obligations (liabilities) towards the environment.

4.3 Other aspects

4.3.1 Other aspects of CARE

CARE allows an information gain on the costs associated with a sustainable business model, by distinguishing between preservation costs and operating costs, and by providing an appropriate classification to enrich:

- an analysis of a company's internal performance. For instance, is profitability at the expense of natural solvency?

[36] Declared as a legal person in 2017.
[37] https://www.greatlakeslaw.org/blog/2019/02/lake-erie-bill-of-rights.html
[38] Excerpt from the Lake Erie Bill of Rights: "Lake Erie, and the Lake Erie watershed, possess the right to exist, flourish, and naturally evolve. The Lake Erie Ecosystem shall include all natural water features, communities of organisms, soil as well as terrestrial and aquatic sub ecosystems that are part of Lake Erie and its watershed [...] All rights secured by this law are inherent, fundamental, and unalienable, and shall be self-executing and enforceable against both private and public actors. Further implementing legislation shall not be required for the City of Toledo, the residents of the City, or the ecosystems and natural communities protected by this law, to enforce all of the provisions of this law".

- dialogue with investors. For instance, the possibility of basing investment on integrated performances; as explained in Figure C1, the possibility of distinguishing between financing needs of core business and for transition assistance (see Case Study 4). This aspect of CARE is the basis of discussions with the extra-financial commission of the French Society of Financial Analysts;
- dialogue with customers. In particular, a presentation of the costs associated with preserving capitals, properly structured, can generate a new consent to pay on the part of customers who want to have responsible purchases (as in the case of initiatives like "C'est qui le Patron,"[39] where the presentation of certain social issues/costs[40] to consumers makes it possible to empower consumers and generate a new consent to pay higher prices). This is one the purposes of one of the experiments of CARE in the distribution sector;
- dialogue with public authorities. CARE can be seen as an evolution of the accounting system, capable of defining the basis for socio-environmental taxation and subsidy policies, adapted to the needs and specificities of companies;
- understanding costs throughout the value chain;
- the information and information system needs, at the level of companies, sectors, and public authorities, necessary to ensure the preservation of capitals and the management of preservation costs (see Case Study 2 and part 3.3.2).

4.3.2 Articulating CARE with the "Accounting for the management of ecosystems" approach and model

Ultimately, CARE needs to be articulated with accounting methods (1) that allow assessing natural capital in biophysical metrics in order to define ecological targets in collective action contexts and measure the specific contributions brought by a firm to achieve them; (2) that can become the support of a collective dialogue and negotiation process with other stakeholders that interact strategically with a firm at the ecosystem management scale, and share the responsibility for its ecological quality.

A specific "Accounting for the management of ecosystems" method and model at the ecosystem scale thus needs to be implemented in complement to CARE (Feger, 2016; Feger & Mermet, 2017, 2018, 2019). This is key to progress towards a complete accounting system that goes from the internal management of a company to the collective and inter-organizational management of specific ecosystems (Feger & Rambaud, 2019). This will allow individual firms involved in collective ecosystem management dynamics to assess whether and how their actions really contribute to obtaining ecological results relative to other actors' actions, and to evaluate the costs necessary for providing these efforts. Three main aspects of such ecosystem-centered accounting models are summed up here (Feger, 2016; Feger & Mermet, 2017, 2018, 2019):

(a) There is first a need to establish structured accounts of ecological results and performances obtained at the ecosystem level (in biophysical and ecological terms, based on conservation sciences as well as available environmental regulatory standards) to serve as a collective reference to organizations involved in its collective management (e.g., in Case Study 2, accounts for water quality status and performance targets at the scale of the catchment on which the real estate company and other organizations operate).

(b) Accounting for ecological impacts and contributions to assess how specific activities and operations from different actors - including those of a given company implementing CARE - are impacting negatively the overall ecological quality of the ecosystem at hand (e.g., a given ecosystem functioning; a given species habitat). In addition, accounts need to be established to measure how actions and efforts negotiated and undertaken by different organizations contribute to the sound

[39] https://lamarqueduconsommateur.com/

[40] Structured in this way (for milk): Grazing about 3 months a year: +0.01€ per carton of milk / Remuneration that allows the producer to pay himself properly: +0.08€ / Etc.

management of the ecosystem (for a more detailed description of the possible structures of these accounts, see Feger (2016) and Feger & Mermet)2018)).

(c) The “accounting for the management of ecosystems” approach recognizes the great diversity of ecosystem governance and management contexts and does not promote ready-made solutions (Feger et al., 2017; Feger, Mermet, McKenzie, & Vira, 2017; Mermet, 2018; Mermet, Homewood, Dobson, & Billé, 2013; Mermet, Laurans, & Leménager, 2014). Defining how the accounts can be used for negotiation and long-term management between actors requires in-depth analysis of the realities of the collective action dynamics, strategic interactions, and institutional structures at play in each given ecosystem. The main accounts (ecological results, impacts, contributions) however have the same general structure, which can allow for comparability between situations. These accounts can also be a basis for a structuration and pre-standardization of ecological accounts at the ecosystem scale, across this diversity of contexts.

5. Next steps

The next steps in the R&D program associated with CARE include:

- an extension of the organizations involved in this project (in different countries), in terms of consulting firms,[41] of companies ready to test the model,[42] of public institutions interested in supporting this project, of academic organizations wishing to collaborate on this subject, etc.;
- the continuation and increase of experiments;
- the continuation of an in-depth study on natural (and human) capitals, to understand their nature and how to preserve them, and thus better measure their preservation costs (see following point);
- the efforts of articulation with ecosystem-centered accounting, on theoretical, conceptual, and practical levels;
- the practical and theoretical development of the different aspects mentioned in the section “Other aspects of CARE” (see part 3.3);
- CARE’s implications on business models;
- specific work on accounting standardization that would enable the model to become operational at the European level.

A detailed version of Annex C is available on the website of the "Ecological Accounting" Chair: https://www.chaire-comptabilite-ecologique.fr/publications/

[41] For example, a French CSR consulting firm is currently working on the feasibility of developing CARE within the framework of public accounting.

[42] For instance, CARE is included in a recently awarded project (named Sesame) of the French program “Territoires d’Innovation”. This program is supported by the French state within the framework of the “Grand Investment Plan” to develop innovations on a large scale in response to the transformation needs expressed by the actors in the winning territories. The Sesame project is located in the Paris region and focuses on agro-ecology and the ecological and energy transition (in the context of farms and the redevelopment of the territory concerned). CARE will be tested as an accounting model to support this ecological transition, in partnership with “Fermes d’Avenir” and researchers of the chair “Ecological Accounting”.

Annex D – Integrating Natural Capital into Financial Accounting

1. Overview

This method is a proof of concept of what reporting could look like if natural capital accounting were fully integrated with financial accounting. The focus is on the reporting statements at the end of this accounting process: combining financial reporting statements with the natural/social capital reporting statements (the natural capital income statement and natural capital balance sheet). It illustrates one potential (long-term) direction of travel for reporting, which could occur (in particular) because of investor motivations for clearer environmental and social impacts. By combining these accounting practices, it implicitly places the same weight on information from natural capital reporting as financial reporting. Therefore, natural capital accounting is not relegated into a separate document or chapter of wider annual reports. However, looking beyond reporting, it is also important to highlight the significance of integrated *thinking*, as closer integration enables more cohesive decision making on investment and could have a more significant effect on capital allocation (SAICA, 2015).

It does not, however, seek to outline a detailed set of accounting procedures on how this could be implemented – the case studies only include illustrative examples of the double-entry process that could be developed for this in the future. This also does not seek to solve the discussion on whether monetization is the right approach to help management of natural capital resources. The reporting statements focus on the monetary values, but in practice these statements will be accompanied by underlying accounts that include physical measures of natural capital.

Ultimately, this approach would require more substantive changes to the financial accounting ecosystem than the other methods presented in this report. This includes (potential) changes to national legislation on company reporting or changes to the way in which accounting issues are defined within International Accounting Standards (IASs). If implemented, more work would also be required on the technical detail and on managing transition. Therefore, this method is included as a proof of concept within this project – see the main report for more information.

2. Context

Current accounting practices, as in the International Accounting Standards (IAS), set a clear objective for financial reporting: “to provide financial information that is useful to users in making decisions relating to providing resources to the entity” (International Financial Reporting Standards (IFRS), 2018). IAS 1 describes financial reporting information as information useful to a wider range of users to make “economic decisions.” This financial information provides insights into the long-term financial health (e.g., non-current liability) of the business and short-term financial performance, however it does not provide a complete picture of business. In particular, it does not account for: (i) longer-term risks and opportunities (i.e., impacts) to business or dependencies of business on natural resources; and (ii) shorter-/longer-term impacts to society (i.e., externalities). Companies are increasingly exposed to these through external regulation, legal action, etc., but these are often hidden to decision makers/users of this information. The lack of information on impacts and dependencies is an inherent gap in financial accounting and reporting, which has been targeted separately by natural and social capital accounting (see WHAT section of the main report for more information).

This method presents how these two (currently) separate, preexisting practices *could* be fully integrated. As a proof of concept, it is important to understand where this sits within current accounting practices and (more importantly) what changes would need to occur to make full integration practical.

2.1 Links to current financial accounting practices

Full integration relies on taking traditional financial accounting as the starting point, which means information that feeds into this method must be consistent with International Accounting Standards (IAS). Financial information is based on market-based values (i.e., fair valuation) and/or historic costs, where entries into the financial reports (assets, liabilities, etc.) must meet a number of requirements. The current financial standards allow for some level of integration of natural capital (see WHAT section of the main report), however, there are still limitations to integrating natural capital within financial accounting.

For example, one of the two fundamental qualitative characteristics of financial reporting is that financial information must be a "faithful representation." Although this opens the door for more complete reporting of business impacts and dependencies, the standards set requirements on measurement uncertainty to fulfill faithful representation. According to the IFRS Conceptual Framework, measurement uncertainty "does not necessarily prevent the use of a measurement basis that provides relevant information," however "if [uncertainty is] too high [it] might make it necessary to consider selecting a different measurement basis" (IFRS, 2018). This means that if a financial impact cannot reasonably be measured, valued, or attributed to the enterprise, it is not recognized in the financial accounts.

Natural capital accounting values and measures are inherently more uncertain given the combination of market and non-market values, which makes justification of faithful representation more difficult. Including additional line items in the financial reporting statements adjusted to reflect natural/social capital factors without meeting the requirement for faithful representation produces a reporting statement that sits beyond the scope of the IFRS. This does not stop a user from taking on board this information, particularly if the user is looking for a more complete picture of natural capital impacts and dependencies, but disclosure in separate reporting statements limits the accessibility for some stakeholders.

In order for full integration to occur within financial accounting, a combination of the following must occur:

- Changes in statutory requirements for accounting and reporting – the two components of these requirements are the International Accounting Standards (IAS) and the national/regional legislation. If both change at the same time, this would require changes in financial accounting and/or reporting by business. However, in reality, these components are likely to take time to change, and there is likely to be a delay between these components – whether national/regional legislation reacts to changes in the IAS or the standards react to legislation in a specific country/region.

  Looking at the most fundamental definitions within the standards, changes could be implemented through (for example): (1) a change to how economic behavior is defined in the IAS 1; (2) an expansion of the requirements for financial information;[43] (3) changes to the threshold at which the probability of the financial impacts that relate to nature are recognized and the level of accuracy required.

- Changes to the requirements / implicit motivations of investors – changes to the corporate financial reporting requirements will have a direct knock-on effect on investors. In addition, investors could also experience changes in regulatory requirements for investors' reporting or could prompt voluntary changes in a sufficiently large group of investors around natural or social capital factors (e.g., in response to the Task Force on Climate-Related Financial Disclosure (TCFD) requirements). In the

[43] This will allow business to make economic social and environmental decisions irrespective of whether the social and environmental impacts have financial consequences.

longer term, this could also be due to changes in legislation to clarify the basic motivations of investors for consuming financial information, as they consider natural and social capital impacts and dependencies to be material.

- Internal governance / management-driven changes – internal changes to meet stricter requirements set by internal audit committees require better accounting (financial and/or management accounts), particularly for the sustainability committee. Changes may also be due to (or reinforced by) targets set by companies' management and/or in response to pressures from investors/regulators. Finally, there are strong indications that integrating natural capital accounting practices, which requires a multi-department input, will allow for closer internal engagement of departments. This could reinforce (rather than drive) integration further.

The most important change required to allow implementation at scale are to the accounting standards, but all of these aspects are complementary and many are likely to occur simultaneously.

2.2 Links to natural capital accounting practices

Similarly, full integration relies on readily available natural capital accounting that is comparable to its financial counterparts. Although there are increasing signs of convergence, unlike financial accounting, there is no (single) standard for natural capital accounting, as methods have grown organically to fit the requirements of different businesses and implementation remains voluntary. Although there are a multitude of different reporting methods under the wider umbrella of natural capital accounting, the key methods with obvious similarities to its financial counterparts are the natural capital income statement (or Environmental Profit and Loss, EP&L),[44] the natural capital balance sheet (or Corporate Natural Capital Account, CNCA – see eftec et al. (2015)) and the combined Natural Capital Statements approach (or NatCapStatements™ – see Koshy et al. (2019)).

This report focuses on the reporting statements, but as described in their respective references, the Environmental Profit and Loss (EP&L), Corporate Natural Capital Account (CNCA), and Natural Capital Statements approaches involve significant underlying schedules in their development.[45] This level of detail is not outlined here in order to focus the discussion more on the reporting.

Depending on the context of the business, the appropriate method will vary. As set out in Table D1, there are several key differences in the insights (or use case) and applicability of the natural capital income statement and balance sheet. Combined, the Natural Capital Statements provide complementary insights for businesses from both reporting statements.

[44] See: https://www.kering.com/en/sustainability/environmental-profit-loss/

[45] For example, as set out in Koshy et al. (2019), the full Natural Capital Statements involves a combination of: materiality mapping of relevant impacts and dependencies; natural capital asset register (of physical measures of asset health); separate physical and monetary flow accounts for the positive and negative flows from the impacts/dependencies of the business to natural capital; and a maintenance cost account of operating expenses to maintain a defined state of natural capital.

Table D2: Insights of the natural capital income statement/ balance sheet

	Integrated natural capital income statement	Integrated natural capital balance sheet
Time horizon	Short term (annual)	Long term
Value to business / society	Primarily value to society	Value to business and to society
Valuation method	Primarily non-market values	Market and non-market values
Impacts / dependencies on natural capital	Mainly impacts	Both impacts and dependencies
Types of businesses method is best suited for...	Primarily value-chain focused	Any organization with spatial management responsibility

Given that there are no formal standards for natural capital assessments or accounting, changes to historic standards / legislation is not an issue. However, in order to achieve full integration with financial accounting, it still requires a combination of the following:

- Introduction of standardized natural capital accounting/reporting practices and principles – the implementation of standardized practices and principles has slowly begun to occur given the growing application of different natural capital accounting methods. Standardization of (a subset of) these methods could also allow for closer association with their financial counterparts – enabling more consistent integration over time.
- Increased financially focused external reporting of sustainability – this could be achieved through a number of different avenues, including: changes in investor requests, stricter non-financial disclosure legislation, social pressures for better reporting. Ultimately, these require more comprehensive, consistent reporting of impacts and dependencies. In order for these to be directly comparable to financial reporting, it is also useful for more monetary values to be used in natural capital accounting, complemented by relevant quantitative metrics. This comparability is likely to be especially useful for investors, who are a key stakeholder in driving this change due to their position within the decision-making process.
- Changes to internal requirements for natural capital accounting/reporting – environmental/social targets set by a business may require closer integration of financial and natural capital accounting practices for reporting on investment decision making to risk committees (for example). This is likely to be reinforced by the above changes, for more transparent reporting.

Overall, closer integration could be achieved more easily from natural capital accounting (compared to financial accounting) as the accounting methods continue to grow and develop through application, but as with financial accounting, the final step to full integration may be years away.

3. Results

Two case studies are outlined below to show practical examples of this methodology.

3.1 Case Study 1: Integrating the profit and loss account

This case study refers to anonymized data for a supply chain-focused multinational organization which reports a natural capital income statement. Table D2 presents the financial income statement for the financial year 2018, which indicates a net income from operations of €611 million in 2018.

Table D2: Group financial income statement (f.y. 2018)

	EUR million
Revenue	3,143
Cost of sales	(797)
Gross margin	***2,346***
Payroll expenses	(478)
Other recurring operating income and expenses	(960)
Recurring operating income	***907***
Other non-recurring operating income and expenses	(51)
Operating income	***856***
Finance costs, net	(48)
Income before tax	***808***
Income tax expense	(200)
Share in earnings/(losses) of invested companies	3
Net income from operations	**611**

In the same reporting cycle, the company reports separately a natural capital income statement with a (net) loss of approximately €118 million in its total social and environmental impacts from operations. At its simplest, the bookkeeping for this would be to debit the natural capital impacts account(s) (initially in physical metrics and later in monetary values) and then credit a provision (a long-term liability) to account for the losses to the environment from the monetary impacts – this is illustrated in Box D1. This specific treatment is required as these impacts are externalities,[46] so there is no direct cost to the business.

[46] Externalities – A consequence of an action that affects someone other than the agent undertaking that action, and for which the agent is neither compensated nor penalized. Externalities can be either positive or negative (Natural Capital Coalition, 2016).

Box D1: Illustrative double-entry accounts (Case Study 1)

The below T-account illustrates how natural capital impacts could be accounted for each year – this is similar to the approach illustrated in Houdet et al. (2014). There could be separate accounts for each form of impact (e.g., carbon emission, water consumption, soil erosion) in physical values (e.g., tons of emissions) and then in monetary values. For example, as a result of a company's activities the estimated impact of air pollution on human health is €10 in a given year, it is debit the natural capital impacts account and credit the natural capital impacts provision. At the end of the year, the natural capital impacts account will be closed off (like any expense) with a credit of €10 in the impact account and credit in the (natural capital) income statement.

Natural capital impacts a/c

Natural capital impact provision	€10	Income statement	€10
	€10		€10

The provision (a liability) will accumulate over time and feed into the company's balance sheet. As set out below, if the balance of the previous year of the natural capital impact provision was €100, this will then accumulate to €110 and will be reflected in the balance sheet under non-current liabilities.

Natural capital impacts provision a/c

		Balance brought forward	€100
Balance carried forward	€110	Natural capital impacts	€10
	€110		€110

For this liability to be reduced, it would require the company to realize some of the cost through investments to improve the environment (e.g., investments to improve the land or through the purchase of offsets). This provision could also lead to the company setting up a fund to return the state of the natural environment to its original condition (for example). For more information on how this could be treated, please see the Method 2 Annex B.

Note, if the impacts were positive, these entries would simply be reversed.

Overall, the impact intensity on net income from operations of the potential exposure to this social and environmental cost is approximately 24% - i.e., the percentage change in net income from the financial income statement (Table D.2) and the integrated income statement (Table D.3). Although, the social and environmental impacts are reported separately, this company (like many) do not report on what the impacts of integrating the net loss to society will involve.

Table D3 reports the financial income statement shown in Figure D2 with an additional line item for social and environmental costs. The internalization of these additional externalities means that the business still has a going concern (i.e., it still makes a profit), but the new line item results in a 19% reduction in the net income from operations in the same financial year.

Table D1: Group integrated income statement (f.y. 2018)

	EUR million
Revenue	3,143
Cost of sales	(797)
Gross margin	***2,346***
Payroll expenses	(478)
Social and environmental costs	(118)
Other recurring operating income and expenses	(960)
Recurring operating income	***789***
Other non-recurring operating income and expenses	(51)
Operating income	***738***
Finance costs, net	(48)
Income before tax	***690***
Income tax expense *	(200)
Share in earnings/(losses) of invested companies	3
Net income from operations	**493**

** implications on tax would depend on national tax law, but it is assumed that the social and environmental costs are excluded.*

It is important to note that the implications of this adjustment are not only on the income statement, but also on the balance sheet. Naturally, any changes to the net income value will have implications on the retained earnings for the year, and therefore the company's reserves – particularly if looking at (consolidated) group accounts. As noted previously, the double entry for this change would then have to come through increases in the liabilities, in line with a long-term provision set up by the business for social and environmental impacts. This can have implications for a business's capital growth.

However, investors may be more interested in the dividend income, rather than capital growth. If the reserve/fund is held outside of the organization, it would not have any impact on the distributable reserve (which feeds into dividends), but if held within the organization, then internalizing the social and environmental costs could have implications on capital allocation decisions. Increases in the negative social and environmental costs would reduce the distributable reserves. It would result in an incentive (for company management) to shift capital towards lower impact projects and for investors looking across their portfolio – for example using an adjusted dividend discount model (DDM) – to allocate towards individual investments with lower (negative) impact. In practice, a net positive result could also increase the distributable reserves and act as a positive driver towards investments with a positive impact.

Irrespective of where the reserve/fund is held, this would require an effective assurance process to be implemented in order for the system to function.

There are pros and cons to this approach (see Table D4).

Table D4: Pros and cons of integrating the profit and loss account

Pros	Cons
• Direct effect on investment decision making and internal KPIs • Direct effect on investors' decision making and resource allocation • Indirect effects on investors' motivations for investing • Key step could be achieved by a (relatively) simple change to companies law relating to clarification of True and Fair to cover social and environmental impacts	• For wider application, need significant changes to the current accounting standards • Complexities in accounting for the (revised) distributable reserves • Changes to the conceptual framework may not lead to changes in accounting standards • Could take time to implement due to national differences in regulations • It is assumed that there would be no tax effect, so the items would be an adjustment in the tax computation • This would require further standardization on recognition and valuation of impacts on ecosystem

3.2 Case Study 2: Integrating the natural capital statements

This case study combines financial reports and natural capital reports of an anonymized paper and pulp company. As set out in Tables D5-D8, this includes publicly available financial information for the financial year 2018, as well as the natural capital income statement and balance sheet for the same financial year.

Table D5. Financial income statement

Income Statement (2018)	EUR million
Net sales	2,841
Other operating income	319
Change in inventories	-24
Change in value in biological assets	127
Raw materials and consumables	-1,032
Personnel costs	-469
Other operating expenses	-1,157
Result from joint ventures and participations in associates	-1
Items affecting comparability	21
EBITDA	**626**
Depreciation	-206
Operating profit	**420**
Financial income	7
Financial expenses	-23
Profit before tax	**404**
Taxes	-77
Profit for the period	**327**

Table D6. Financial balance sheet

Financial Balance sheet (2018)	EUR million
ASSETS	
Non-current assets	
Biological assets	5,687
Other non-current assets	2,899
Total non-current assets	8,586
Total current assets	926
Total assets	**9,511**
EQUITY AND LIABILITIES	
Equity	
Owners of the Parent	
Share capital	434
Other capital provided	1,262
Reserves	-677
Retained earnings	6,361
Total equity owners of the Parent	**7,381**
Non-controlling interests	0
Total equity	**7,381**
Total non-current liabilities	**1,535**
Total current liabilities	**595**
Total liabilities	**2,130**
Total equity and liabilities	**9,511**

Table D7. Natural capital income statement

	Total impact EUR million
Sources of enhancement to natural capital	
Net carbon sequestration of productive forestland	37
Total enhancement	**37**
Sources of deterioration to natural capital	
Air pollution	(13)
Climate change	(194)
Loss of wider social benefits from productive forestland	(100)
Raw materials sourcing	(50)
Total deterioration	**(358)**
Net contribution to natural capital	**(321)**

Table D8. Natural capital balance sheet

Natural Capital Balance Sheet (2018)		Value to business	Value to society	Total Value	Of which reported in financial accounts
Assets		EUR million	EUR million	EUR million	EUR million
1	Timber	5,688		5,688	5,688
2	Biofuels	2,653		2,653	
3	Seedlings	450		450	-
4	Carbon sequestration		5,500	5,500	-
5	Recreational benefits		<1	<1	
6	Wider social benefits		8,080	8,080	-
	Gross asset value	**8,790**	**13,580**	**22,370**	5,688
Liabilities					
6	Maintenance provisions	(5,532)		(5,532)	-
7	Resource provisions		-	-	-
	Total liabilities	**(5,532)**	**-**	**(5,532)**	**-**
8	Retained earnings to stakeholders		69	69	
Total net natural capital		**3,259**	**13,580**	**16,839**	**5,688**

The follosing accounts combine these individual reporting statements into (I) an integrated balance sheet (Table D9) and (II) an integrated income statement (Table D10). This presents an alternative format to the approach in the first method, by distinguishing beween the value to the business and value to society.[47] In practice, the creation of these accounts would involve a series of accounting practices that are not outlined here.

[47] Value to business assesses how natural capital impacts and/or dependencies affect, positively or negatively, the financial performance of the company (i.e., the bottom line) and thus the value at risk. In contrast, value to society refers to understanding the significance of your natural capital impacts and dependencies to other/external stakeholders (Natural Capital Coalition, 2016).

Table D9: Integrated income statement

Integrated Income Statement (2018)	Value to business EUR million	Value to society EUR million	Total value EUR million
Net sales	2,841		2,841
Other operating income	319		319
Change in inventories	-24		-24
Change in value in biological assets	127		127
Raw materials and consumables	-1,032		-1,032
Personnel costs	-469		-469
Other operating expenses	-1,157		-1,157
Result from joint ventures and participations in associates	-1		-1
Items affecting comparability	21		21
Net contribution to natural capital		**-321**	**-321**
EBITDA	**626**		**304**
Depreciation	-206		-206
Operating profit	**420**		**99**
Financial income	7		7
Financial expenses	-23		-23
Profit before tax	**404**		**83**
Taxes	-77		-77
Profit for the period	**327**		**6**

Table D10: Integrated balance sheet in 2018 under the Integrating natural capital into financial accounting method

Integrated Balance Sheet (2018)	**Value to business** EUR million	**Value to society** EUR million	**Total value** EUR million
ASSETS			
Non-current assets			
Biological assets	5,687		5,687
Natural capital assets	**3,103**	**13,580**	**16,683**
Other non-current assets	2,899		2,899
Total non-current assets	11,688		25,268
Total current assets	926		926
Total assets	**12,614**		**26,194**
EQUITY AND LIABILITIES			
Equity			
Owners of the Parent			
Share capital	434		434
Other capital provided	1,262		1,262
Reserves	-677		-677
Reserves to natural capital	**-1,388**	**7,943**	**6,555**
Retained earnings	6,361	**-321**	6,040
Total equity owners of the Parent	**5,993**	**7,622**	**13,615**
Non-controlling interests	0		0
Total equity	**5,993**	**7,622**	**13,615**
Non-current liabilities			
Natural capital maintenance cost provision	**5,532**		**5,532**
Other non-current liabilities	1,535		1,535
Total non-current liabilities	**7,066**		**7,066**
Total current liabilities	**595**		**595**
Total liabilities	**7,662**	**-**	**7,662**
Total equity and liabilities	**13,655**	**7,622**	**21,277**

For an illustrative example of the accounts that could be applied for natural capital impacts please refer to Box D1, and see Box D2 for a similar illustrative example of accounts for natural capital dependencies.

Box D2: Illustrative double-entry accounts (Case Study 2)

The below set of T-accounts illustrate how natural capital dependencies could be accounted for each year. This illustrative example takes a simple case where the plantation forest grows by 10m^3 of timber in a given year, which depends on inputs from the environment in terms of carbon dioxide (which results in carbon dioxide being sequestered into the tree biomass) and water consumed. The trees also remove pollutants from the atmosphere. Given that this illustrates a production function, this is assumed to produce no balancing brought forward in physical terms.

Timber production (growth, physical) a/c

Carbon sequestration	5t	Timber	10m^3
Water consumption	1m^3		
	-		-

Focusing on the carbon, the 5t consumed by the trees (i.e., sequestered) is credited in the annual sequestration account. This is netted off with the loss from the embedded carbon due to the felling of trees/loss of other biomass to result in a net benefit to the income statement of 4.5t. In the annual carbon sequestration monetary T-accounts, this could be priced at the social cost of carbon. Given that sequestration is a benefit to society this would be a positive value and enter the income statement as a source of income. Water would follow a similar pattern but is a cost to society, which would be treated in the income statement as cost.

Annual carbon sequestration (physical) a/c

Loss due to felling/natural falling	0.5t		
Income statement	4.5t	Timber production (growth)	5t
	5t		5t

The balance sheet also includes an entry for carbon sequestration as an asset, but this is based on the projected future benefits from sequestration. This would be tested every year (including using information from the annual carbon sequestration) and adjusted accordingly.

For timber, the contra entry would be in the timber accounts. The stock of timber increases by the timber production (debit), but reduces by the felling and natural falling of tree branches, etc. (credit). The resulting balancing value reflects the current standing stock. This quantitative measure is also used to undertake an update to the assessment of the timber asset value, which follows IAS 41 (on agricultural goods).

Timber stock (physical) a/c

Balance brought forward	100m^3	Felling of trees	4m^3
Timber production (growth)	10m^3	Fallen tree branches etc.	1m^3
		Balance carried forward	106m^3
	110m^3		110m^3

The integrated income statement (I) takes figures from the financial income statement in the value to business and adds the profit/loss from the net contribution to natural capital (i.e., the profit/loss from the natural capital income statement). As the natural capital income statement is valued using the impacts on society from the operations of the business (from sequestration, air pollution, etc.) the net loss is recorded in the value to

society. This means that if the company were forced to internalize these costs due to changes in raw material prices, legislation on air quality, etc. they could be exposed to (up to) 51% reduction in their earnings before interest, taxes, depreciation and amortization (EBITDA) and will be just above breakeven on their profit for the period. Although the likelihood of this scale of impact is low, it (crucially) indicates that the paper and pulp company is still able to operate on an ongoing basis (i.e., meet going concern).

In contrast, the integrated balance sheet (II) has four key insights:

- The asset base has increased in part due to underreported book value of assets – the asset value to the business has risen by €3,103 million, in line with gross asset value in the natural capital balance sheet, excluding the timber value which is already accounted for in the biological assets (in line with IAS 41).
- The asset base has increased primarily due to the unreported book value of assets to society – the asset value to society has risen by €13,580 million, in line with the natural capital balance sheet. This reflects the positive dependence on society of the company's maintenance of its forest asset as a carbon sink as well as other nonmarket values. Although these values are external to the business, this does not mean that they will never be internalized by the company. Changes in legislation, public opinion on management practices, internal targets/Key Performance Indicators (KPIs) (e.g., in line with Sustainable Development Goals, SDGs), and/or broader forces relevant to share prices could result in direct/indirect internalization of these values.
- Liabilities have risen – this is driven entirely by the inclusion of a contingent liability to reflect the estimated cost of maintaining the forest assets over its (preexisting) forest schedule as well as the provision for the impacts from production.
- Equity has fallen due to a fall in retained earnings – this reflects the treatment in the integrated income statement of the net loss in contribution to natural capital.
- Shareholder equity has risen overall due to reserves for natural capital – this balancing figure reflects the net impacts to shareholder capital from the undervalued natural capital assets.

These results indicate that although there is a net negative effect in the short term due to exposure from the impacts of the company's operations, in the long term, the management of its forest assets remain sustainable. A deeper dive would be required to highlight further risks and opportunities to the business.

There are pros and cons to this approach (see Table D7).

Table D7. Pros and cons of Integrating Natural Capital Statements

Pros	Cons
• Shows the financial and non-financial values in one single statement, focusing on material impacts and dependencies using the common metric of monetary units • Distinguishes between the value to business and to society, allowing users of the accounts to consider each aspect separately or in combination • Allows for the assessment of both the impacts and dependencies to natural capital	• Combines market-based and non-market-based valuation figures in the same statement, which risks inconsistencies and potential double counting • Cannot be implemented (in practice) within current accounting standards, but may be applicable alongside the standards

4. Methodology in practice

The purpose of assessing this methodology is to articulate its potential practical application. The following section outlines the viability of this method in practice.

4.1 Innovation

The key innovation of this method is in illustrating integrated reports using specific natural capital accounting results that have, so far, only been reported separately. The natural capital income statement and balance sheet are uniquely suited for this application.

This is not necessarily the first, or only, application of an integrated set of reports. The Integrated Reporting movement advocates for this, although so far South Africa is the only country to require Johannesburg Stock Exchange (JSE)-listed companies to publish annual integrated reports (under the King Code for Corporate Governance). Beyond this, a more recent example is Olam's Integrated Impact Statement, although the combined statement is intended as a complement to the financial reporting (not a replacement). However, none of these approaches advocate the use of a single reporting statement that combines values for financial and natural/ social capital.

The simplicity of this approach is that a single statement forces investors, managers, and analysts to recognize natural capital values side-by-side with traditional financial reporting. This goes back to the basis of current (financial) reporting and its assumption that investors are only interested in financial returns – which is not always true. Particularly given the growing importance of impact investing and management, and movement towards standardization (see Impact Management Project).

However, this simplification is also a potential drawback. Without the necessary mechanisms in place, there is no reason why a company would have the motivation to undertake this level of integration; nor the know-how to undertake the detailed accounting procedures required to implement both financial accounting and natural capital accounting. Illustrative examples have been included here for one possible way of conducting the double-entry procedure, but developing a detailed set of guidelines for companies would (alone) be a multi-year project.

4.2 Application

The potential widespread application of this method in practice depends on its practicality, replicability, and scalability. As outlined previously, there are practical challenges – technical and political – to this method. Overall implementation of this method would require:

- Changes to national legislation – For example in the UK, the UK Companies Act requires that accounts are true and fair or in accordance with International Accounting Standards. If national legislation were to define True and Fair as including social and environmental outcomes, companies could (in theory) make changes to accounts that are beyond the scope of the International Accounting Standards. In turn, this could help investors define their motivation for making investments as including financial, social, and environmental factors; and/or
- Changes to the accounting standards – It is possible to call on the International Accounting Standard Board and national standard setters and regulators to revise standards, for example through the Interpretations Committee. In order to implement the required large-scale changes outlined above, changes may need to be made to the definition of assets and liabilities in the Conceptual Framework (as a precursor to the change to International Accounting Standards).

Once such standards are in place, the replicability is easy to follow as it sets a reference or outline for implementation.

The scalability of the accounts is also dependent on a certain level of standardization. Businesses currently follow consistent methods for financial accounting, but vary on natural capital accounting. In order to get to scale, it is important to increase the reporting requirements for businesses (for example through legislation) whilst supporting the more innovative companies trying new natural accounting approaches.

One factor that supports scalability is the increasing availability of data collected by a number of organizations or required by investors. As with the accounting practices, standardization of this information, through (for example) the Impact Management project (IMP) and the Value Balancing Alliance (VBA), is increasing its availability.

Deeper integration does not require a single statement, potential interim alternatives include:

1. Separate integrated reporting statements, as with Olam. While this partly defeats the point of a single statement for all stakeholders, it could be an achievable intermediate step to achieving full integration.
2. Comparison of the financial and natural capital reporting statements through ratios – again this defeats the point of maximizing visibility by merging statements. However, it could sidestep technical complications surrounding the methodology of integrating the accounts. Instead, equivalents to financial ratios could be used to present the relationship between the financial reporting statement and natural capital reporting statement (e.g., the return on shareholder equity, net of natural capital reserves; liquidity ratios that account for value to business, value to society and/or combined; or financial risk ratios that account for the contingent liabilities surrounding the long-term maintenance costs).

4.3 Other aspects

Investor motivations are an important aspect – although investment managers may be cautious of natural capital data (due to unfamiliarity, and concerns of assurance and consistency) and short time horizons (compared to much longer-term horizons for natural capital accounting). This approach forces these aspects to be taken into account. Changing the bottom line in financial accounting could affect investors, directly through their dividends and indirectly through (for example) the impacts on share price.

5. Next steps

This method is a proof of concept of one potential direction of travel of financial and natural capital accounting/ reporting. It builds on the recent evolution of natural capital accounting and reporting to reflect their financial counterparts and demonstrates how natural capital accounting data can be included in existing financial accounting and reporting formats.

For the European context, this simple next step shows a practical, replicable, and scalable method. However, its widespread adoption would depend (at the very least) on changes to accounting standards and company law: to require current financial accounting to include statements of non-financial values. In time, this would most likely be implemented through an extension of the Non-Financial Reporting Directive, both in terms of driving consistency in the recognition and valuation of social and environmental outcomes but also in terms of the integration of those outcomes.

For the European Sustainable Finance Strategy, the key is to ensure that resulting legislation and standards are such that they enable the closer integration of natural and financial capital in decision making. In particular:

- Instigating reviews of financial reporting requirements that will be in collaboration with the international accounting standards bodies.
- Increasing the baseline of the minimum required reporting by businesses, particularly through the non-financial reporting directive.
- Enabling the development of standardization and further developments of natural capital accounting/reporting.

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