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How businesses measure their impacts on nature: A gap analysis

A working paper by the University of Cambridge Institute for Sustainability Leadership

The University of Cambridge Institute for Sustainability Leadership

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Executive summary

Investors and companies alike want to create long-term value by mitigating risks and improving their impact on the natural environment. Company productivity is dependent upon a resilient environment and reducing impacts is beneficial to both nature and business. Opportunities exist for investors and companies to demonstrate positive impacts and show they are reversing the trend of natural environment degradation. The challenge is to identify metrics that are relevant for businesses' decision making processes, whilst being simple and practical for investors to use.

A plethora of methodologies, standards and tools exist that help investors and businesses understand their interaction with the natural environment. However, these tend not to provide directional, specific information for companies to measure and demonstrate impacts upon the natural environment; instead they offer guidance.

Until consistent, context based metrics are developed natural capital measures will continue to be misunderstood and disregarded, and will not become mainstream in decision-making.

This report assesses the drivers for companies to use impact metrics, it evaluates the support that already exists, and identifies where the gaps are.

Why investors and corporates want impact metrics

The drivers for businesses to use impact metrics were identified following discussions with a number of companies. The top drivers were:

- To support operational decision-making
- To meet regulatory and investor demands
- To engage both externally with consumers and internally with employees

The investor community was also consulted. The top drivers were:

- To meet client demand for products with positive impacts
- To respond to stakeholder interest in the disclosure of investment portfolio impact

Impact metrics could be used for a variety of objectives within the business community. Different audiences were identified to have different uses for impact metrics. For example, chief operating officers could use them to formulate strategy and assess performance; finance and sustainability teams could use them to ensure the company's operations are delivering environmental benefits and meeting company targets; metrics could be used within supply chains to monitor site conditions; and performance could be disclosed to stakeholders via reporting standards.

What companies already measure

While businesses are already reporting on their environmental performance within a variety of reporting schemes such as the Global Reporting Initiative, these are based on providing transparency on their activities rather than detailed measurement and monitoring of impact. There are currently no agreed common standards for assessing impact. Most businesses don't assess the impact on natural capital as a whole but determine their impact on biodiversity, soil, water and carbon separately. Many are not robustly assessing biodiversity and soil.

In terms of where impact was assessed, this tended to be monitored at the supply chain level rather than during raw material production. This presents business risks; the largest impacts occur at raw material production and by not considering impacts up supply chains these risks are not being captured nor addressed.

Who is engaging with impact metrics

There are a number of different stakeholder groups working with businesses in the natural capital space and supporting them in assessing and reporting their environmental impacts. These can be summarised into four categories: 1) those who help with disclosure; 2) those providing decision-making support (focusing on the use of measurement and valuation); 3) regulators; and 4) research funders.

Supporting disclosure

Three types of organisation seek to aid businesses in considering their environmental impacts and/or dependencies for internal decision-making and external disclosures: standard setters, membership organisations and professional bodies. The research underpinning this report showed that standard setters and membership organisations are the most engaged across the natural capital topics spanning biodiversity, soil, water and carbon. However, a number of potential gaps were identified that need to be addressed. The gaps included a lack of metrics that are accurate, context-based and consider biodiversity and soil.

Supporting decision-making

There are three types of organisation that support companies in their decision-making around natural capital: NGOs, charities and membership organisations. The analysis showed that data is available across the soil, water, biodiversity and carbon topics but it is if often inaccessible or presented in a format that is not replicable. The data can often be presented in large volumes of information which is not usable or useful to business.

Key findings

This study reveals the following key findings:

- There is a need for useful, simple and commonly accepted impact metrics that can help shape operational decision-making, engage with civil society, and respond to investor requests.
- Most businesses report on separate metrics rather than one aggregated value; this may not be as useful to the investor community.
- While water and carbon are relatively well monitored, biodiversity and soil are often not adequately assessed in impact metrics
- The environmental metrics that are currently available to businesses lack context.
- There is an extensive range of organisations that support businesses in evaluating their impact and dependencies on the natural environment for the purposes of disclosure and decision-making; however, they do not provide consistency in recommended metrics.
- It is recommended that impact metrics should follow a set of principles to be meaningful; measurable and comparable; possible to aggregate; practical; easily accessible; replicable and credible; take into account local context; be responsive to changes in business practices; and drive business decisions.

Metrics that are meaningful to both investors and businesses can only be co-created by convening the business, investor and decision-support communities.

Contents

1 Introduction

Multinational business corporations represent 40 per cent of the world's 100 largest economies in monetary value and constitute a significant force in shaping the natural environment through their transformation of raw materials into the multitude of products available today. Despite the sustainability of their activities long being recognised as fundamental for ensuring global development outcomes[1], the majority of corporations have only just begun to acknowledge the importance of a productive natural environment to their business, and the risks that increasing global levels of biodiversity loss[2] and natural disasters[3] are causing to their supply chains[3-6]. Development of national policies and growing investor demands on corporate non-financial disclosure are further factors that have influenced recent increases in company sustainability assessments[7-9].

In light of the growing recognition of business impacts and dependencies upon the natural environment, a group of businesses alongside a selection of investors have expressed a need to collaborate. They are working with CISL to develop clear metrics that they can use to demonstrate their progress in reducing impacts on the natural environment, which can be more tangibly categorised into biodiversity, soil, water and carbon.

This report explores existing business practices around metrics and measurement, identifies a range of different organisations that support business in their measurement, and analyses the gaps and needs that exist for a clearer set of simplified metrics that business can apply in their decision-making and disclosure.

2 Business perspectives

Many businesses already consider their impacts and dependencies upon the natural environment using a variety of approaches, metrics, tools, and guidance. However, the difficulty is that these have not be standardised and there is a desire from businesses to have clarity on what metrics they should be using and where there are synergies with other initiatives and peers.

Members of CISL's Natural Capital Leaders Platform were interviewed to determine:

- The audience and objectives for environmental metrics;
- What data, approaches and reporting methods are currently used; and
- Where gaps in metrics exist and how businesses would like these to be addressed.

2.1 Business drivers for impact metrics

Businesses are already reporting on environmental metrics, either voluntarily or to comply with regulations. In addition to these drivers, they revealed that an increased number of requests from investors and risk-rating agencies have created stronger incentives for the use of metrics; these metrics are used to carry out more thorough reporting of environmental impacts. However, businesses explained they do not have clear sight of which metrics investors currently use or indeed what format they would require for corporate metrics to be useful. As well as meeting regulatory and investor demands, businesses expressed a need for metrics to support operational decision-making and engage with consumers and employees (Figure 1). Other drivers mentioned include the need for policy discussions with governments, for long-term resilience, to establish a business case for sustainability, to meet science-based targets, and to meet sustainability goals. While government and customers require businesses to report against certain standards, businesses also envisage environmental metrics being an important way to position themselves and be ranked externally by third parties. Metrics that assess impacts on the natural environment can play a big part in corporate transparency and visibility.

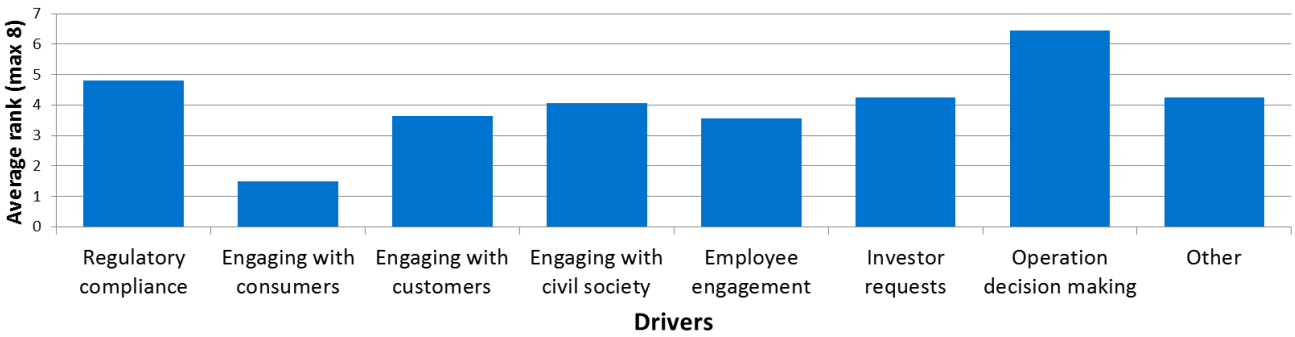


Figure 1: Average ranking of business drivers for using environmental metrics according to importance (1 is lowest and 8 is highest)

While businesses are already using data obtained from impact assessments to some extent, the interviews revealed they were keen to extend the use of these assessments to communicate externally (particularly to investors), demonstrate how the business is performing according to baselines in a systematic manner, and help define their strategies by enabling them to report against internal targets.

2.2 Users of impact metrics

The businesses interviewed agreed that there were a number of different objectives to developing impact metrics and that these should be relevant to a range of business and investor audiences (Table 1). To meet this need there is a requirement for metrics that can be applied both upstream in supply chains, particularly at the site of raw material production, and be aggregated into high-level indicators to be shared externally with investors.

Investor audience	**Objectives**
Pension funds' beneficiaries investing public	• Select funds that are aligned with their interest in social and environmental sustainability • Engage with fund provider to improve social and environmental outcomes
ESG research	• Assess the social and environmental impact of companies in order to inform selection or exclusion in investment portfolios Engage with investees (companies) to improve the social and environmental outcomes of investment portfolios
Portfolio managers, product development, sales	• Use outcome metrics to construct investment strategies/investment products that explicitly optimise for social and environmental outcomes • Report on social/ environmental investment portfolio outcomes alongside financial returns
Business audience	**Objectives**
Investor relations	• Communicate environmental impact of business to investors
Regulatory bodies	• Log and report performance against commitments • Disclose performance, eg through reporting frameworks and annual reports, to external stakeholders • Monitor performance against plans and refine tactics to meet company goals and legal obligations for ecosystems under its control
Finance department	• Assure that expenditures are delivering stated benefits • Differentiate company in sales • Control cost and risk • Tender for additional sources of finance
Strategy team	• Formulate strategy and operationalise sustainability • Inform risk assessment/investment appraisal • Comply with cost control and customer KPIs • Link sustainability objectives to business objectives
Upstream supply chain partners	• Ensure traceability in procurement • Maintain engagement and support of site operators for managing/enhancing biodiversity on their sites • Show efficiency and value added in production and manufacturing • Monitor change in the condition of sites over time with the help of grounds maintenance contractors
Sustainability teams	• Articulate sustainability objectives in the context of specific corporate roles/jobs • Create alignment opportunities and identify shared benefits for value creation and improved livelihoods • Show that sustainable activities have resulted in improved incomes (e.g. yield increases)
External relations	• Communicate on risk management and value creation • Communicate with NGOs and government departments • Show consumers that products have been sustainably produced and/or are of higher quality

Table 1: Investor and business audiences and their objectives for impact metrics

2.3 Current approaches used by businesses

While some of the businesses interviewed do measure and monitor impact at the corporate level, all of those interviewed also measure impact at the supply chain level, which includes indirect impacts on the natural environment (Figure 2). At the supply chain level, businesses primarily report through life cycle assessments and using third parties for the reporting. They mostly assess carbon emissions, deforestation, and water consumption. Businesses report at the corporate level particularly through corporate social responsibility reporting and within direct operations, for example in shops, manufacturing plants, and factories. Measuring and monitoring impact upon the natural environment is not yet a central part of how businesses measure progress.

Figure 2: Levels at which businesses measure and monitor impact (percentage of all businesses interviewed).

2.3.1 Reporting schemes

The main reporting schemes used by the businesses interviewed are the Carbon Disclosure Project (CDP) and the Dow Jones Sustainability index (**Figure** 3). Under CDP, businesses can assess their impacts on climate change, water, forests, and supply chains. The businesses reported that the simple measures laid out in CDP have been useful in engaging the investor community; it was suggested that if simple metrics were also developed for biodiversity and soil, these could influence business practice and investor requests. A significant barrier to enabling change at a broader scale was the lack of an open source methodology, particularly with respect to the use of the Dow Jones Sustainability Index.

A number of the businesses interviewed report to the Global Reporting Initiative (GRI) and to its core guidelines. However, the focus of the GRI is on businesses providing transparency to their activities rather than detailed measurement and monitoring of impact. It therefore does not, for example, include peer reviewed impact metrics and indicators, nor does it provide a robust means for representing metrics such as those related to biodiversity. Businesses also report impact as part of certification schemes or other programmes including the World Wildlife Fund (WWF)'s Environmental Paper Company Index, the Confederation of European Paper Industry (CEPI)'s '10 Toes Framework' for the development of carbon footprints for paper and board products, the Roundtable on Sustainable Palm Oil, the Forest Stewardship Council, and the Rainforest Alliance.

While some overlap exists between the different schemes, there is currently no agreed common standard. Most of the schemes cover carbon emissions and water-use quite comprehensively, especially through footprinting, while biodiversity and soil are not included as effectively. The businesses revealed that there is a huge potential for reporting schemes to drive change but that there is a need to gain better insight into what metrics the investment community requires. They believe this would create a real incentive for the use of robust impact metrics

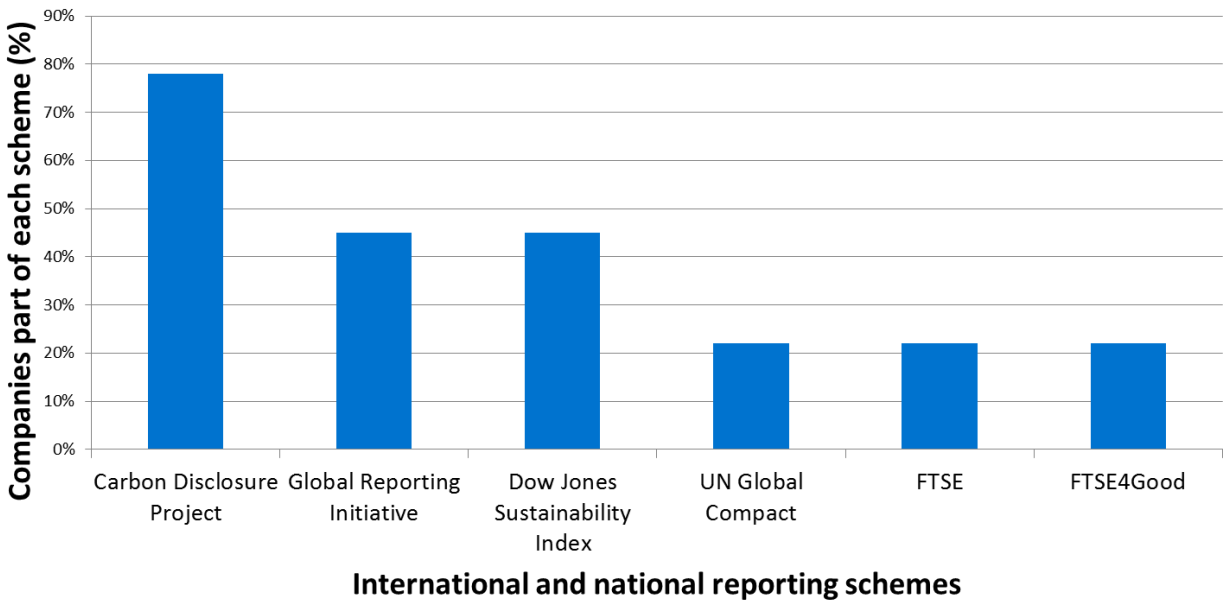


Figure 3: The international/national reporting schemes and initiatives that businesses are part of (percentage of all businesses interviewed)

Other reporting schemes which have company participation between five and 15 per cent are shown below:

- Sedex
- Oxfam behind the brands scheme
- DEFRA
- Ofwat
- Integrated reporting council
- BITC Corporate Responsibility Index
- STOXX index
- Euronext Vigeo
- Enjeux Les Echos
- Ethibel Sustainability Index
- MSCI Global Sustainability Indices
- Johannesburg Stock Exchange
- FTSE4Good Index

2.3.2 Application of impact assessments

Businesses are currently using the data obtained from impact assessments and valuations in a number of practical and strategic ways. Examples of these include looking at how to better use the data obtained from impact assessments to reduce activity in high-risk areas, to change sourcing processes, and to reduce their impact (and that of their supply chains) on the environment (Figure 4).

There is therefore an opportunity to improve and optimise the use of impact metrics to satisfy these objectives.

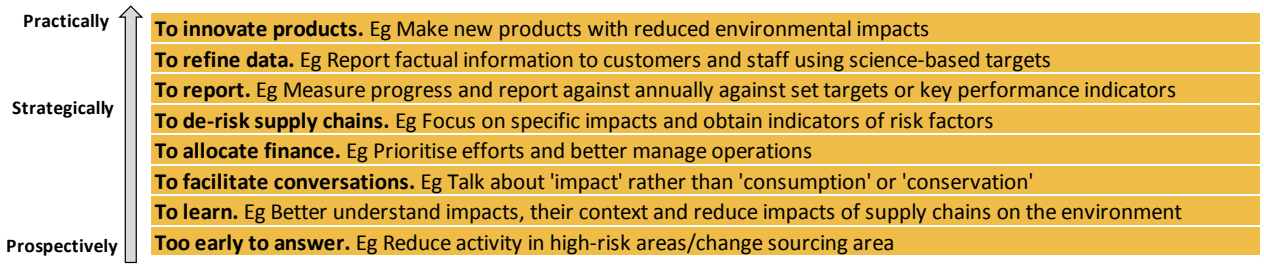


Figure 4: How businesses currently use the data obtained from impacts assessments and valuations.

2.4 Measuring impact on biodiversity, soil, water and carbon

The businesses were asked what metrics they use to measure impacts upon biodiversity, soil, water, and carbon. Most businesses determine their impact on each element separately rather than using a general, aggregated measure that summarises impacts and dependencies on natural assets in a single metric. Only one of the businesses interviewed uses an aggregated value within its own reporting methodology, referred to as Environmental Profit and Loss accounting[10]. One limitation to this methodology is based on how it currently represents impacts on biodiversity and ecosystem services.

2.4.1 Biodiversity and soil

Biodiversity and soil are less often reported on, and are frequently aggregated into a general land use proxy. The businesses expressed the use of a land use indicator as unhelpful and 'not good enough' for assessing their realised impact.

Some businesses assess biodiversity impacts by comparing the status of their Sites of Special Scientific Interest, designated sites, and protected areas with averages at the national level. Other businesses engage more actively in ecological surveys and field trials in order to determine their biodiversity impact. Some businesses rejected the idea of using baseline information on biodiversity as they believe there should no presumptions regarding its ideal condition, while others measure change in biodiversity within their production sites with respect to pristine conditions.

In terms of measuring soil impacts, some agricultural-based businesses are carrying out field tests with farmers and using geospatial modelling and geotechnical analyses to better assess their impacts on soil. They believe that it is important that both input metrics (such as the soil's water retention coefficient) and output metrics (such as crop yield) are used when assessing impacts on soil. However, there is generally a lack of meaningful metrics and understanding of soil health.

2.4.2 Water

The interviews showed that water-use is consistently reported on by businesses, through assessment of water consumption and intensity of use during processing. Tools such as the World Resources Institute's Aqueduct tool [11], water-stress coefficients, and bio-indicators are used to support businesses in assessing their impacts and dependencies on water. Many of the tools and models are too generic or high-level and it was suggested that more site-specificity is required when measuring water impacts and dependencies. It was reported that appropriate water metrics require full disclosure from suppliers, with a clear awareness of tonnage used and provenance of water.

2.4.3 Carbon

Carbon is well reported by the interviewed businesses, through carbon footprints, direct carbon emissions, carbon in the energy imported, and carbon used in the supply chain. Some businesses have specific targets for carbon use (i.e. capital carbon, operational carbon), and products are generally designed with the aim of using the least amount of carbon in their production.

The interviews indicated that while the businesses already measure their impacts on the natural environment to a certain extent, there are concerns that the metrics they are currently using are not adequate (Table 2).

	Metric	Pros	Cons
Biodiversity	Proxy: land use Site of Specific Scientific Interest, European designated sites, or protected areas Environmental impact assessments Biodiversity hotspots Conversion from pristine to production landscapes Above ground biomass per hectare Species richness per hectare Trial work and ecological surveys	✓ site-specific	X lacks granularity X lacks context X too general X based on very coarse data X lack of definition of 'pristine' X based on globally compiled datasets X based on globally compiled datasets
Soil	Proxy: crop yield 'Good heart' and soil health Nutrient balance and carbon content Vulnerability to fire Soil water retention coefficient Carrying capacity Soil erodibility	✓ useful metric ✓ important for the long-term ✓ identifies risk areas	X does not consider environmental impacts X There is a lack of understanding about what healthy soil means X difficult to measure X based on estimates
Water	Stress level and coefficient and scarcity values Proxy: tonnage to water consumption and intensity Eutrophication, acidification and sedimentation Water footprints Bio-indicators	✓ measured at site ✓ based on inputs ✓ based on LCAs ✓ based on compiled indices	X use global data and baseline information
Carbon	Road fuel, fuel consumption through gas electricity and solid fuel Proxy: tonnage to greenhouse gas emissions Direct carbon emissions calculated annually Carbon capture, fuel use, high carbon products, carbon imported in energy	✓ measured at site ✓ measured at site and along the supply chain ✓ reported on through LCAs	X based on modelling

Table 2: Summary of how businesses currently measure their impacts on biodiversity, soil, water, and carbon

2.5 Analysis of gaps identified

The responses provided in the business interviews point to a gap in terms of the current reporting initiatives and schemes and the specific metrics they refer to. The businesses identified a clear need for impact metrics that help shape operational decision-making, comply with regulatory demands, and respond to investor requests. While there is a significant potential for current reporting schemes to enable change, a pull is needed from the investment community to drive better assessments of impacts.

Investors need access to metrics that are useful and simple; most businesses report on metrics that look at separate indicators rather than one aggregated value, which may not be as useful to the investor community. It would be preferable for metrics to assess impact both at the site of raw material production and have the potential to be aggregated into high-level indicators.

Businesses tend to measure and monitor impact at the supply chain level, mainly using life cycle assessments and third parties for reporting. Often these assessments do not cover impacts at the site of raw material production, which has been reported as having the largest impact on the environment [10].

While water and carbon are relatively well monitored, biodiversity and soil are often not adequately assessed in existing impact metrics. It was reported that, on the whole, there is a lack of meaningful metrics that can be used to disclose performance to investors, as well as to drive operational decision-making.

Environmental metrics that are currently used do not measure positive impacts or added value, and there is an opportunity for businesses to use environmental metrics to disclose their positive performance with respect to the natural environment.

3 Engagement of stakeholders

Businesses are supported by a variety stakeholders, organisations, and initiatives in exploring and demonstrating their impacts and dependencies upon the natural environment. However, as outlined in section 3, there appear to be gaps in providing businesses with concrete, replicable, and accessible metrics that can be used in their internal decision-making processes, reporting, and disclosure to investors.

This section identifies and analyses some of the critical stakeholders that work with business in assessing their relationship with the natural environment.

3.1 Stakeholders involved in assessing impact on the natural environment

There are a number of different stakeholder groups who are involved in the field of natural capital[*], as shown in figure 5. In order to illustrate the connections between different types of organisations the stakeholders are grouped into **four** different categories adapted from [14]:

Category	Stakeholder mapping	
Disclosure and decision-making support for businesses This group includes those working on biodiversity, soil, water, and carbon issues from the *perspective of business* by developing frameworks, voluntary standards, reports, and guidance. Examples include: membership organisations, standard setters, certification bodies, sector specific bodies and professional bodies.	Certification bodies/round tables e.g. • FSC[c] • RTSPO, other[c] Sector specific bodies** e.g. • Consumer Goods Forum • IPIECA Professional bodies e.g. • Accounting • Management accounting	Standard setters* e.g. • SASB[g] • CDSB[g] • GRI[g] • IIRC[g] Membership organisations • Natural Capital Coalition • NCFA[e] • WBCSD[e]
Measure and value decision-making support Those stakeholders who research, develop tools and/or guidance for the measurement of environmental change and impacts or dependencies on the natural environment. Examples include: Academics, charities, and NGOs.	NGOs e.g. • The Natural Capital Project • The Nature Conservancy • UNEP[d] Academics e.g. • University of Cambridge • University of York (BESS[b])	Charities e.g. • WWF • IUCN[f] • Conservation International • Accounting for Sustainability
Regulators and research funders This group includes a number of different organisations that fund research, produce reports, and develop frameworks and guidance to address specific issues relating to biodiversity, soil, water and carbon. The information produced can be considered in most cases to be a public good i.e. the results of a project are likely to be publically	Governments • Participants in WAVES[a] • EU business and biodiversity platform	Funders e.g. • Foundations • Development Banks • Research councils

[*] 'Natural capital' is defined as the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, and minerals) that combine to provide benefits to people ([12,13])

Category	Stakeholder mapping	
available. Examples include: foundations such as, Rockefeller, Gordon and Betty Moore, Governments, and development banks.		
Businesses A range of businesses address environmental topics either as part of their core business or as part of their corporate responsibility practices.	Businesses e.g. • Kering • Mars • Yorkshire Water	

Figure 5: Stakeholder mapping showing those involved in assessing impacts on the natural environment[†]

A number of the organisations collaborate across and within categories depending on the nature of the issue being addressed. This report focuses on three of these stakeholder groups who are most active in directly developing approaches and metrics for environmental impacts.

a – WAVES – Wealth Accounting Value Ecosystem Services; b – Biodiversity Ecosystem Services Sustainability c- FSC – Forest Stewardship Council, Roundtable on sustainable palm oil, d- United Nations Environment Program; e – Natural Capital Finance Alliance, World Business Council for Sustainable Development; f – IUCN – International Union for the Conservation of Nature; g – SASB – CDSB – Climate Disclosure Standards Board; GRI – Global Reporting Initiative; IIRC – Integrated Reporting Council; * - voluntary standards. ** Sector specific bodies were considered out scope of this qualitative piece of work due to time and resources constraints e.g. the Food and Agricultural Organisation's Sustainability Assessment of Food and Agriculture systems (SAFA) Guidelines

3.2 Alignment with existing stakeholders

Given the current level of interest in the field of the natural environment and impact metrics it makes sense to align any new work in this area with that already available, and to ensure that current gaps in knowledge are being addressed.

The successful uptake of work to fill these gaps requires the engagement of these critical stakeholders. Careful alignment is necessary to:

- Ensure that those organisations with the greatest reach are involved i.e. those able to target the audience for the intended research, potentially increasing the uptake of any research outputs
- Ensure that there is a link to existing voluntary reporting standards, especially if the research seeks to address gaps in metrics for business disclosures
- Build on existing and on-going research, making sure that work in this area is additive and complementary to provide increased value

Two stakeholder groups were identified as being most active and critical to engage:

- Those working on disclosure and decision-making support for businesses (see section 5);
- Those undertaking research and analysis of how to measure and value environmental change (see section 6).

High-level reviews were conducted of the metrics and tools being used and developed by these stakeholders, specifically in relation to biodiversity, soil, water, and carbon.

4 Disclosure and decision-making support for business

4.1 Introduction

A number of different types of organisations endeavour to provide decision-making and disclosure support to businesses on the natural environment. These include:

- Membership organisations
- Standard Setters
- Professional bodies
- Certification bodies

This section will review the support offered to businesses for disclosure and decision-making from these organisations.

A more in depth assessment of standard setters is also provided, based upon the outputs of several interviews with these organisations to assess potential gaps in current guidance for impact metrics, specifically on biodiversity, soil, water, and carbon.

4.2 Standard setters, membership organisations, and professional bodies

Three types of organisation are involved in developing business-focused tools and guidelines and conducting research to support businesses in considering their environmental impacts and/or dependencies for internal decision-making and external disclosure purposes. These can be categorised as: 1) standard setters; 2) membership organisations; and 3) professional bodies (modified from [15]).

- **Standard setters (SS)** are considered to be those creating frameworks for reporting sector-specific information in relation to the natural environment. Note: at the moment frameworks and reporting guidelines are voluntary.

- **Professional bodies (PB)** are considered to be those who strengthen particular professions by: ensuring members behave according to codes of conduct, promoting the role of their profession, and providing training to members. Depending on the nature of the professional body in question these organisations can perform regulatory and disciplinary activities, act in the public interest, and represent the interest of their members. They can also support standard setting and research activities. The research has currently been limited to accounting bodies given the professions involvement in the development of the Natural Capital Protocol.

- **Membership organisations (MO)** are considered to be those who support their members in relation to achieving goals related to the natural environment through the development of tools and research. Membership organisations consider the interests of their members and in many cases seek to collaborate with other organisations to develop reports and guidance to help steer their members through different issues, such as those relating to the natural environment.*

*The Natural Capital Coalition is grouped with other member organisations but operates in a slightly different manner i.e. it is a coalition of organisations rather than membership based.

The level of engagement on biodiversity, soil, water and carbon for each organisation was calculated by scoring points on the following criteria:

Engagement level	Details
	No specific engagement
	Engagement with other initiatives
	Reports/ Guidelines
	Active projects

The results are shown in Table 3 (see Annex A for the scores for each organisation).

Key Players	Type	Role of the organisations	B	S	W	C
The Sustainability Accounting Standards Board (SASB)[1,3]	SS	Creating frameworks for reporting sector-specific information in relation to the natural environment, among other topics/issues. Note at the moment frameworks and reporting guidelines are voluntary. Each has a slightly different approach (see section 4.3).				
Climate Disclosure Standards Board (CDSB)[1,3]	SS					
Global Reporting Initiative (GRI)[1,3]	SS					
International Integrated Reporting Council (IIRC)[1]	SS					
International Organisation for Standardisation (ISO)[1]	SS					
Association of Chartered Certified Accountants (ACCA)[1]	PB	Each of these accounting-focused organisations: • Promote the role of professional accountants in modern economies • Provide a route for trainees to gain professional accountancy qualifications • Represent the interests of qualified accountant members • Perform some regulatory and disciplinary activities • Support standard-setting activities, e.g. through commenting on proposals • Sponsor and originating research into business and accounting issues • Generally act in the public interest (e.g. commenting on proposed legislation and tax rules).				
Institute of Chartered Accountants in England & Wales (ICAEW)[1]	PB					
Chartered Institute of Management Accountants (CIMA)[1]	PB					
International Federation of Accountants (IFAC)[1]	PB					
Natural Capital Coalition NCC[1,2]	MO	A membership organisation specifically working on the issues relating to the natural environment. Latest work includes: The Natural Capital Protocol designed to help generate trusted, credible, and actionable information for business managers to inform				

Key Players	Type	Role of the organisations	B	S	W	C
		decisions. The NCC is currently working on a finance sector supplement (FSS) and generally seeks to collaborate with different organisations when addressing difference NC challenges.				
Natural Capital Finance Alliance NCFA[1,2]	MO	The NCFA has two working groups working on the natural environment including III: Accounting for natural capital and IV: Disclosing and reporting on natural capital. The NCFA are currently working with the NCC on the FSS.				

Table 3: Key organisations involved in developing business focused tools and guidelines, or conducting research to support businesses in considering their environmental impacts and/or dependencies. B - biodiversity, S - soil, W - water and C - carbon

* The level of engagement for each organisation was analysed through a combination of the following (see superscripts for each organisation in table 3):

- Searching for references to biodiversity, water, carbon, and soil within insight web pages for each organisation.
- To review, where applicable, the membership/signatories, supporters and partners of different organisations.
- Finally, for three organisations some additional data was obtained during face-to-face or telephone interviews.

Unsurprisingly the organisations that are most engaged on these topics are those setting standards relating to sustainability reporting or membership organisations that specifically engage around the natural environment. However, it is worth noting that professional bodies linked with reporting, i.e. accountancy-based bodies, are engaged on several environmental topics, such as water and carbon.

The extent to which standard setters and membership organisations promote, develop, use/reference/recommend specific metrics in relation to biodiversity, soil, water and carbon is explored in the following section. This analysis is used to identify where gaps exist that need to be addressed.

4.3 Metrics used by standard setters‡

A series of interviews were conducted with three standard setting bodies to develop a snap shot of the specific metrics currently being used. The main findings are summarised in Table 4 and show that each standard setter approaches biodiversity, soil, water, and carbon slightly differently according to their organisation's objectives.

There is no consistency between the types of metrics each organisation recommends for reporting. High-level metrics have been developed across biodiversity, water, and carbon, with a clear gap being soil.

‡ ***Disclaimer:*** *The information contained in the above section is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the situation.*

Standard body	Main framework objectives and focus	Metrics
GRI	**Main framework objectives** To focus on those environmental topics that are applicable to most/all businesses and to consider the larger impacts. **Current reporting focus** - Sustainability reports - Global - Impact emphasis **Current user focus** Any interested stakeholder group	**Biodiversity:** Yes – area based measures **Soil:** No - Not currently **Water:** Yes – use and discharge **Carbon:** Yes - Alignment with GHG Protocol, ISO14064, CDP information request. **Overall**: All metrics are defined by expert panels with contributors from relevant fields.
SASB	**Main framework objectives** To focus on environmental, social, and governance issues that are material based on the USA SEC definition and to enable the integration of these factors with current financial filings to help businesses meet their current obligations. **Current reporting focus** - Integration with mainstream reports and financial filings - USA-centric - Impacts and some dependency emphasis depending on sector **Current user focus** Investors and internal company stakeholders	Sector dependent, all metrics depend on the main material issues that are defined for each sector. This means that there are more specific metrics set out as part of the SASB standard across the themes of biodiversity impact, climate change, hazardous waste, water use, and emissions. As such there are several different types of metric are set out under each theme. An example for the oil and gas sector (NR0101-10) was given as: • Number and aggregate volume of hydrocarbon spills, • volume in Arctic, • volume near shorelines with ESI rankings 8-10, • volume recovered.
CDSB	**Main framework objectives** Encourage standardisation of environmental information reporting in mainstream reports **Current reporting focus** - Integration with mainstream reports and financial filings - Global - Impact emphasis - Some dependency **Current user focus** Main focus on investors	CDSB focuses on sources of environmental impact – defined as activities of and outputs from the organisation that actually or potentially influence or contribute to environmental impacts including: emissions, land use change, resource use, water use and waste etc. CDSB do not specifically mandate or identify metrics but do provide a list of resources to those developing metrics to help businesses consider those that may be useful for their disclosures. These resources are classified based on: - Forest risk commodities, - GHG emissions, - Water - Climate change risk and adaptation - General risks and opportunities.
IIRC	**Main framework objectives** To establish integrated reporting and thinking within mainstream business practice as the norm in the public and private sectors. To align capital allocation and corporate behaviour to wider goals of financial stability and sustainable development through the cycle of integrated	The IIRC do not suggest "specific key performance indicators (KPIs), measurement methods or the disclosure of individual matters. " Those responsible for producing the report need to consider what to include based on: - Materiality and

Standard body	Main framework objectives and focus	Metrics
	reporting and thinking. **Current reporting focus** To identify information to be included in an integrated report for use in assessing an organization's ability to create value **Current user focus** Providers of financial capital Benefits all stakeholders interested in an organization's ability to create value over time	- How information is disclosed Natural capital is described as – *"All renewable and non-renewable environmental resources and processes that provide goods or services that support the past, current or future prosperity of an organization. It includes:* - *air, water, land, minerals and forests* - *biodiversity and eco-system health."* Not all capitals are equally relevant or applicable to all organisations, therefore some capital may not be included in an integrated report.
ISO	**Main framework objectives** Provides world-class specifications for products, services and systems, to ensure quality, safety and efficiency. They are instrumental in facilitating international trade. **Current reporting focus** - General standards for products, services and systems. **Current user focus** Any interested stakeholder group	**Biodiversity**: No - Not currently **Soil**: Yes, ISO on Soil Quality (ISO 10694:1995), which specifies a method for the determination of the total carbon content in soil after dry combustion. There is also an ISO for Environmental Management (ISO/DIS 14055 - Part 1and 2) that provides soil-specific guidelines for establishing good practices for combatting land degradation and desertification. **Water**: Yes, ISO for Water Quality (ISO/TC 147),and they are working to develop the ISO Water footprint (ISO/TC 207/SC 5). **Carbon**: Yes, ISO on Carbon Footprint of products (ISO/TS 14067:2013) that specifies principles, requirements and guidelines for the quantification and communication of the carbon footprint of a product (CFP), based on International Standards on life cycle assessment (ISO 14040 and ISO 14044) for quantification and on environmental labels and declarations (ISO 14020, ISO 14024 and ISO 14025) for communication.

*Information relating to the IIRC and ISO was obtained from their websites only interviews were not undertaken due to time constraints.

Table 4: Summary of main objectives and metrics approaches for standard setters.

4.3.1 Identifying the gaps

There is limited information provided by standards setters on how metrics should be applied by businesses. They tend to suggest either high-level metrics or the application of principles i.e. allowing businesses to decide on the metrics they wish to report and disclose.

The extent to which biodiversity, soil, water, and carbon are covered by each standard varies between the organisations interviewed. The GRI sets out specific metrics for three out of four topics, while CDSB choose not to mandate or to identify specific metrics suggesting businesses focus on those disclosures and metrics that are most relevant. SASB considers reporting from the perspective of those non-financial issues that are important for a particular sector as a whole; as such SASB may or may not advise on metrics specific to biodiversity, soil, water, and carbon. This approach is similar to that set out by the IIRC where there is the potential for all elements of the natural environment to be considered as immaterial when compared with the frameworks of other categories of capital.

The natural elements that hold the greatest data gaps are biodiversity and soil, which may be due their context specificity (e.g. mainly being area-based metrics), lack of available information, and difficulty in assessing their context at a local level in a standardised manner.

Biodiversity: Most frameworks recognise and refer to international designations such as the IUCN Categories of Protected Areas, giving rise to several area-based metrics e.g. activities within or near to designated sites [16]. In addition, CDSB ask for information on whether and to what extent targets are informed by external parameters which could include: planetary boundaries, Aichi biodiversity, etc. however, these are optional. There are few references to areas of 'high conservation value' (HCV) i.e. sites that may have 'value' in terms of their biodiversity but that are not designated via specific protection mechanisms[§]. This illustrates the difficulty of finding and using metrics relating to biodiversity that consider the local context of any specific loss or vulnerability. Such data may represent a large and unfeasible undertaking for a company across all sites in all geographies. However, there may be special cases in which a material holding or site may warrant further investigation and more sophisticated metrics.

Soil: With the exception of ISO, there is no specific mention of metrics relating to soil quality or quantity other than contamination considerations across all of the frameworks (note: SASB may include a detailed metric for soil in relation to a specific sector – a full analysis of all relevant metrics across sectors is beyond the scope of this high-level review). Specifically, the ISO for Soil Quality provides recommendations on how to measure soil carbon content and the ISO for Environmental Management provides information on the deterioration in chemical, physical and biological properties of soil caused by land degradation and desertification.

Carbon and water: Where water and carbon are referenced, the metrics generally relate to the amount used [18] with the exception of G4-EN9[**]. Context specific issues such as water stress and vulnerability to climate change are not specifically considered[††] unless looking at specific sectors e.g. SASB, there are also some plans for further work in this space from entities including: CDP, WRI, UNGC, etc.

Potential gaps:
The key potential gaps to address include:

- The development of more accurate metrics i.e. regional rather than global and country level data;
- Improved biodiversity and soil metrics (through consideration of relevant definitions and ways to report changes in context);
- Strengthening the linkage between any suggested metrics and core business processes.

[§] The core of the HCV approach is the identification and maintenance of critical environmental and social values. In practice, many HCVAs are managed by businesses or communities outside protected area networks and approaches to maintain values vary [17]

** which asks for the size of water source and the value or importance of water source to local communities and indigenous peoples'

[††] Note it is possible that some of SASB's metrics may include potential context variables depending on the sector. However, a full review of their metrics was beyond the scope of this work.

4.3.2 Challenges

There are similar challenges associated with the implementation of each framework relating to data availability, quality, and the associated reporting burden. Each standard setter discussed the difficulty of selecting robust and meaningful data at the company level.

4.3.3 Future direction in 2017

- SASB are conducting consultation and further stakeholder engagement with a view to launching version 1 of their guidelines next year along with an organisational review of their structure.
- The GRI will review and update their water and effluent standards next year, with biodiversity potentially being reviewed in the medium term.
- CDSB are hoping to develop a financial sector supplement for their environmental information and natural capital framework and to work with businesses to produce a series of 1-2 page guidance documents.

4.4 Certification

Certification schemes are run by not-for-profit organisations to ensure that the activities associated with a product, production system, or enterprise meet the appropriate environmental, social, and economic standards of sustainability. They comprise a set of criteria that must be adhered to in order to receive certification.

A multitude of certification schemes exist, each designed with its own focus; Ecolabel Index (http://www.ecolabelindex.com/) identifies 465 certification schemes across 199 countries and 25 industry sectors. Of these schemes, only 10 specifically mention biodiversity, 8 mention soil, 45 schemes refer to water and 33 schemes discuss carbon. Table 5 provides examples of seven popular certification schemes, ranging across farming, fishery, and forestry businesses.

Engagement level	Details
	No specific engagement
	General guidelines
	Prescriptive guidelines

Certification scheme	Main objectives	User focus	Engagement			
			B	S	W	C

Certification scheme	Main objectives	User focus	Engagement			
			B	S	W	C
Fairtrade	Producers and traders have met "Fairtrade Standards", which include social, environmental, and economic criteria, progress requirements, and terms of trade.	Farmers				
Rainforest Alliance	The farm, forest, or tourism enterprise has been audited to meet standards that require environmental, social, and economic sustainability.	Farms, forestry businesses and tourist businesses.				
Better Cotton Standard	To ensure the exchange of good practices in the production of cotton and to encourage the scaling up of collective action to establish "Better Cotton" as a sustainable mainstream commodity	Cotton farmers				
UTZ Certified	Farmers grow better crops, generate more income, and create better opportunities while safeguarding the environment and securing the earth's natural resources. .	Coffee, Cocoa, Tea, Rooibos				
Marine Stewardship Council Certified	Provides evidence that a fishery is well managed and sustainable, regardless of size, type and location.	Fisheries				
Forest Stewardship Council (FSC) Certification scheme	Provides evidence that wood, paper and other forest products are produced from well-managed forests and/or recycled material.	Forestry Businesses				
Programme for the Endorsement of Forest Certification (PEFC)	Ensures that the forest-based product is produced in a sustainable manner.	Forestry Businesses				

Table 5: Examples of certification schemes and their consideration of biodiversity, soil, water and carbon (B, S, W, C).

4.4.1 Identifying the gaps

Of the certification schemes assessed, none provided specific recommendations regarding which metrics should be used for assessing impacts upon the natural environment. Rather, they provide guidance that varies in the amount of detail required for meeting sustainable targets for the preservation of biodiversity, soil, water, and carbon (summarised in Table 5).

Out of those reviewed, only Rainforest Alliance engaged with all four elements of the natural environment, while the Marine Stewardship Council Certification is an example of a scheme that only provided standards for biodiversity, with no consideration of the effect of its fisheries on soil, carbon or water.

Biodiversity: Biodiversity is mentioned in all seven certification schemes to varying degrees. The Fairtrade and Better Cotton Initiative schemes provide the least amount of detail, being limited to very high level recommendations. The Marine Stewardship Council and the two forestry certification schemes provide the greatest detail on biodiversity out if the schemes assessed. The Marine Stewardship Council scheme includes the most specific recommendations relating to stock status

and maximum sustainable yields. The Forest Stewardship Council certification requests demonstration of strategies that enhance high conservation values.

Soil: Soil is mentioned in most certification schemes to varying degrees. The Fairtrade and Forest Stewardship Council Certification schemes provide the least amount of detail for soil, limiting its recommendations to the maintenance of soil fertility and soil protection, but with no specific reference to metrics. Rainforest Alliance is an example of a scheme with very prescriptive guidelines for soil, however these are just guidelines and do not include impact measures.

Water: All schemes with the exception of the Marine Stewardship Council Certification scheme provided recommendations for water use, but are not prescriptive about how to measure their impacts on water.

Carbon: Carbon was mentioned in the least amount of detail across the assessed certification schemes, most of which did not reference it at all. Rainforest Alliance was the only scheme to provide any guidance on carbon use; however this was very general and limited to recommending the implementation of an energy efficiency plan.

Potential gaps to address include:

- Enhancing current certification schemes so they provide more detailed recommendations for meeting sustainability standards, specifically with regards to which metrics they recommend using.
- Ensuring that all elements of the natural environment are addressed within each scheme.

5 Measure and value decision-making support

5.1 Introduction

In order to assess the current status of impact metric development, this study carries out a high-level review of a selection of NGOs, charities, and membership organisations with a wide reach and connection with businesses:

- **NGOs (Non-Governmental Organizations)** are considered as non-profit organizations that are not associated with any government. This can include groups that advocate for any topic or a charitable organisation.
- **Charities** are considered to be any organisation with the purpose of helping address a specific issue. This can be a non-governmental organization, but it can also be organised and/or sponsored by a government.
- **Membership organisation** – are described in section 4.2 above.

These groups were chosen given their focus on decision-making, metrics development, and their direct engagement with businesses on the natural environment. Eleven organisations that provide measurement, valuation, and decision-making support to a range of different audiences were selected for review (Table 6; see Annex B for a full description of the review methods).

Organisation	Acronym	Type
Natural Capital Finance Alliance	NCFA	Member organisation
Natural Capital Coalition	NCC	Member organisation
World Business Council for Sustainable Development	WBCSD	Member organisation
Ceres	-	Member organisation
Cambridge Conservation Initiative	CCI	Charity
Natural Capital Project	-	NGO
The B Team	-	NGO
Conservation International	CI	Charity
The Nature Conservancy	TNC	Charity
Corporate Eco Forum	CEF	Member organisation
World Wildlife Fund	WWF	Charity

Table 6: List of eleven organisations reviewed

The aim of this high-level review was to help determine:

- The reach associated with each type of organisation i.e. Charities, NGOs, and member organisations.
- The gaps associated with existing types of environmental information in terms of their focus and accessibility for business.

5.2 Organisational reach

The potential reach of the membership organisations, charities, and NGOs under review was assessed by considering the number of members, the number of businesses actively engaged, the number of funders, and the partnerships listed on each website. Membership organisations were found to have approximately six times more reach than the next organisation type i.e. charities (see Figure 6). However, charities and NGOs are less represented in this review and may engage with other organisations differently. Indeed, it is likely that both NGOs and charities engage with a greater number of individuals directly, which will not have been picked up through this review.

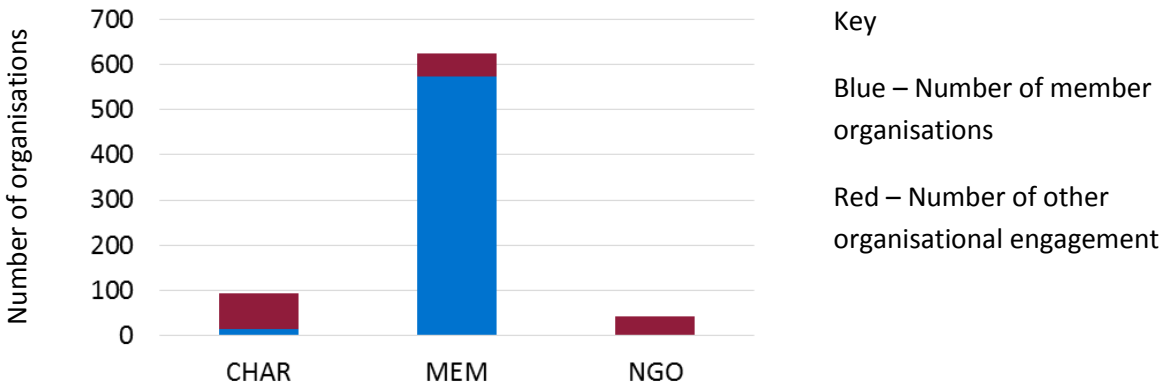
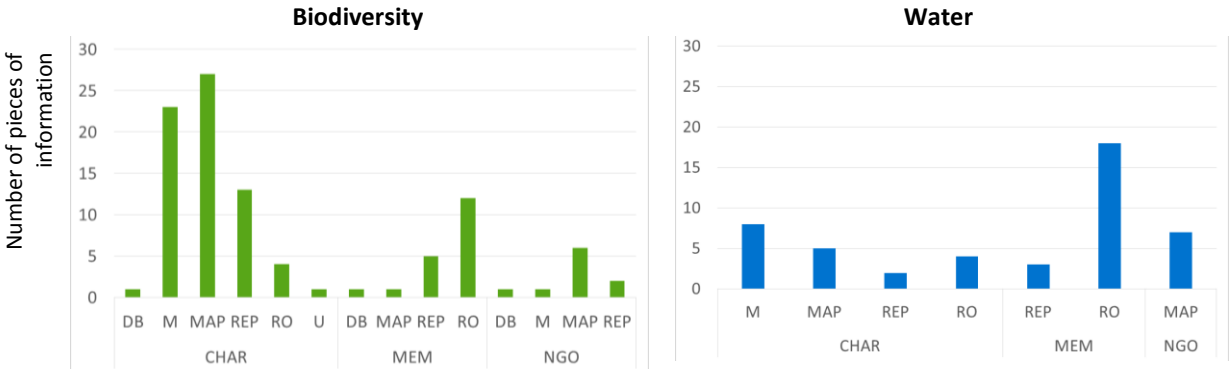


Figure 6: Number of organisations with which different groups engaged

5.3 Accessibility for business

Each of the organisations reviewed provides businesses with data and information associated with biodiversity, soil, water, and carbon. This information can take a variety of different forms, for example based on a map, report or database.



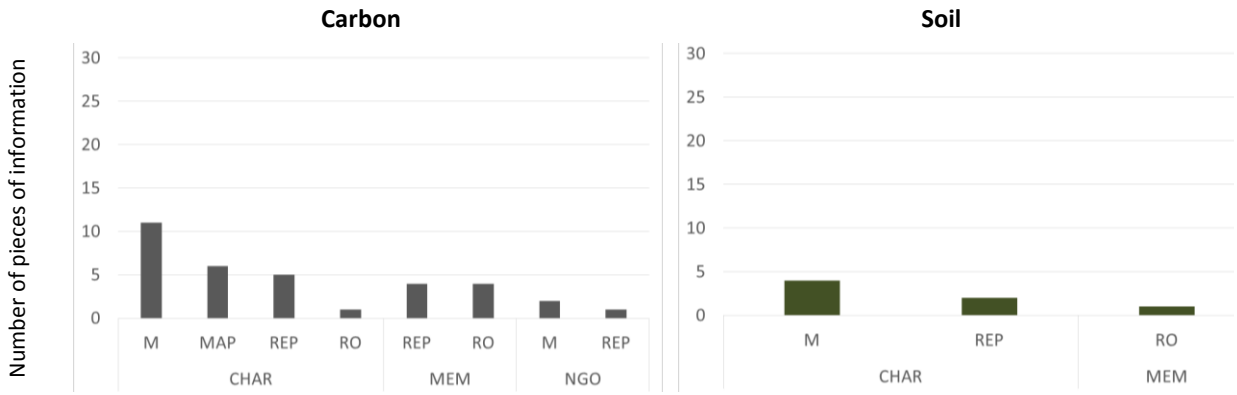


Figure 7 outlines how information for biodiversity, soil, water, and carbon is displayed for each organisation type.

It shows that there are many map-based data available, particularly for the topics of biodiversity and water, across organisation types. Membership organisations are more likely to provide information in the form of reports and through risk and/or opportunity frameworks rather than specific metrics or map-based data.

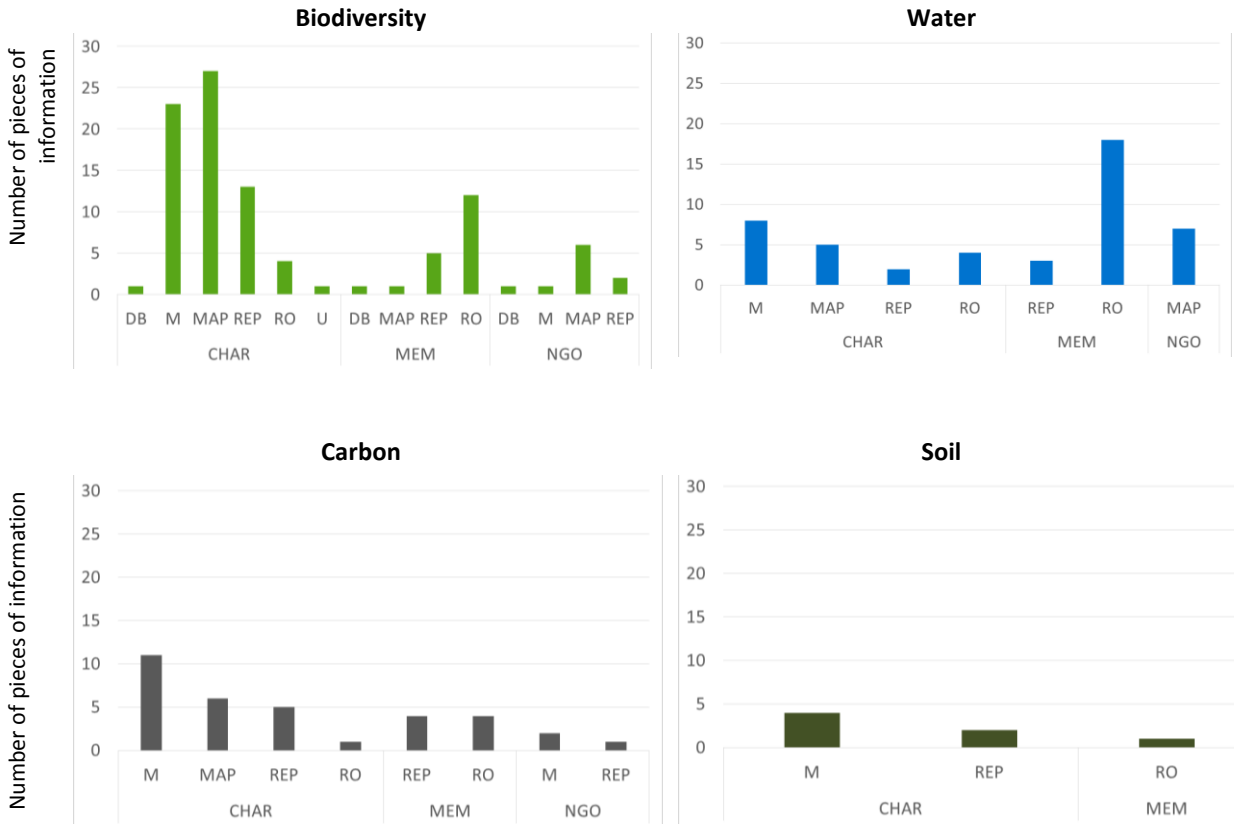


Figure 7: Breakdown of environmental information (by DB: databases; M: metrics; MAP: map information; REP: reports; RO: risk and/or opportunities; U: unclassified)

5.4 NGO guidelines

In addition to the data provided by NGOs, certain NGOs have developed a number of high-level guidelines to direct businesses towards more general, sustainable practices. These include: the SDG Compass, the OECD Guidelines for Multinational Enterprises, The United Nations Global Compact, and the Principles for Responsible Investment. They provide a range of recommendations for responsible business conduct in a global context, but lack precise support relating to specific actions and precise metrics for assessing their impact.

5.5 Identifying the gaps

Both charities and NGOs provide metrics and map-based information most while membership organisations tend to provide information through reports and risk and/or opportunity frameworks/analysis. Charities provided the greatest variety of information for biodiversity, soil, water, and carbon; however, much of this information was likely developed for use by the conservation community rather than for business, suggesting that they may not be available in a format that is directly usable by business.

Biodiversity and soil: Biodiversity had the greatest variety of information available, soil had the least. This is likely to have been influenced by our choice of organisations; more soil-related metrics may be available from the agricultural and farming community (not reviewed here). The information available for biodiversity was either at a high-level e.g. country level protected areas, or at the site-level, potentially leading to limitations as to where the information is used. This review has also highlighted a prevalence of map data for biodiversity, which may be difficult to access for those without GIS knowledge. Most biodiversity metrics appeared to have been developed for those working in the field of conservation, which will have different needs to those of business.

Carbon and water: Carbon and water metrics, where included, focus on: usage/discharge or emissions, vulnerability, adaptation and stress. Specific measures vary for carbon and water but are consistent in terms of being based on discharges/emissions. At a topic level, gaps for both biodiversity and soil information are potentially the largest out of all the natural elements considered.

Overall, the available environmental information tends to be at either a high-level or very specific site-level, which may not always relate specifically to the issue a business is attempting to address.

Potential gaps to address include:

- Improving data accessibility i.e. reporting information should be translated into a more accessible format for business to use when completing analyses relating to the natural environment.
- Providing data that can be used in more contexts. CCI are already looking at some of the issues associated with the use of conservation data.

5.6 Challenges

The main challenges associated with using information on biodiversity, soil, water, and carbon from these types of organisations include:

- Distilling information from the large number of different projects, reports, and tools available in the field, while considering the different audiences for each.

- The difficultly of using a one-size-fits-all approach leading to promotion of higher level data e.g. protected area status, rather than a focus on metrics with slightly more detail.
- Data accessibility as the data often requires a specific skill set to be understood or accessed e.g. either expertise in ecology or GIS, or through reading multiple reports that take to time to review and determine which information is relevant for a specific purpose.

6 Findings from gap analysis of sustainability initiatives

Although businesses are already reporting on environmental metrics (either voluntarily or to comply with regulation), the business interviews identified a clear need for impact metrics that help shape operational decision-making, engage with civil society, and respond to investor requests.

Businesses' feel they need access to metrics that are useful and simple, and could be aggregated from the site-level up to broader indicators that could be useful at a corporate level. Biodiversity and soil were less often reported on compared with water and carbon due to the greater levels of complexity involved in measuring these elements, and the reduced regulatory pressure that companies currently have to report on them. Biodiversity and soil were frequently aggregated or based on proxies, for example through consideration of 'land use impact', which was acknowledged to be a flawed approach. Businesses tended to measure and monitor impact at the supply chain level and often did not cover impacts during raw material production, which has been reported as having the largest impact on the environment [10].

There is an extensive range of organisations that support businesses in evaluating their impact and dependencies on the natural environment, which can be categorised into two main groups: 1) those working on disclosure and decision-making support for businesses and 2) those undertaking research and analysis of how to measure and value environmental change. These groups include standard setters, membership organisations, certification schemes, NGOs and charities.

It was found that there was no consistency in the types of metrics that standard setters recommended for reporting. Where provided, these were found to consist in high-level metrics for biodiversity, water, and carbon, with a clear gap in metrics for soil. Certification schemes were found to lack entirely in recommendations for which metrics might be most appropriate to assess whether an enterprise's activities met the prescribed environmental, social, and economic standards of sustainability.

Of those organisations undertaking research and analysis of how to measure and value environmental change, this review found that organisations were more likely to provide information in the form of reports and through risk and/or opportunity frameworks, whereas charities and NGOs were more likely to provide more precise metrics and map-based information, illustrating the large quantity of information businesses have available to them. Biodiversity was found to have the greatest variety of information available, and soil had the least. Specifically, the information available for biodiversity was either at a high-level e.g. country level protected area data, or at the site-level, highlighting a gap in mid-level/regional information. This review has also highlighted a prevalence of map data for biodiversity, which may be difficult to access for those without GIS knowledge or access to these data layers. Most biodiversity metrics appeared to have been developed for those working in the field of conservation, which will have different needs to those of business. Carbon and water were found to vary in the specific measures recommended, however were consistent in their focus on discharges/emissions.

A key finding of this review was the general lack of context associated with the environmental metrics that are currently available to businesses (with the exception of water use, which is likely to

include information on the availability of water in the area of operation). This realisation reflects one of the main conclusions of a recent UNEP report, highlighting the need for increased efforts to place environmental information in context to obtain greater understanding of a business' "actual environmental performance" [19]. In addition to recommending the inclusion of local context, the UNEP report emphasises the need for a better scientific context for businesses' ecological thresholds and targets[19].

This review has demonstrated how widely the groups working to support businesses differ in the level of detail provided in measuring impact on biodiversity, soil, water, and carbon, thus highlighting the need for precise guidance towards common, context-based metrics that can be used across both the investor and business sectors.

7 Metrics requirements and recommendations

This review has emphasised the need for common metrics for assessing business' impact on biodiversity, soil, water and carbon. It concluded that these metrics need to be able to track impact from the site-level up to an aggregate measure at corporate level in order to engage with company and investors. The metric should also be responsive enough to reveal changes in business practices within a range of short to longer-term intervals, based on investor and business requirements. Out of the four natural elements considered, metrics for biodiversity and soil appear to be the least readily available for business, with the greatest variation in data quality, often in formats that are less accessible for businesses.

A recent CISL report has recommended that metrics should take into account the following principles[10]: They must be:

- **Meaningful**
- **Measurable and comparable**
- **Practical**
- **Replicable and credible**
- **Responsive**

This review has highlighted additional refinements to the above criteria, including the need for metrics that:

- **Can be aggregated**
- **Based on data that is accessible**
- **Take into account the local context**
- **Drive business decisions**

The key principles are expanded on in Table 7. CISL will work together with the Natural Capital Leaders Platform and the Investment Leaders Platform to develop metrics for biodiversity, soil, water and carbon that are based on these criteria, and assessed to the same level of detail. These can then be translated into a measure that is tangible to the general public.

Principle	Definition
Meaningful	Meaningful to business and investor communities so it can be used to drive decision making. Methodology is clearly understood.
Measurable and comparable	Allows for comparison across geographies and time.
Possible to aggregate	Can be aggregated from site-level to regional and global scales.
Practical	Data is easily accessible, measurable by company or using free, globally available data. Ability to substitute better information where available
Replicable and credible	Based on a reputable scientific method.
Context based	Considers local conditions/levels to reflect 'impact' (beyond 'usage')
Responsive	Responds to changes and improvements in company activities, both in the short and long term.

Table 7: Key principles for biodiversity, soil, water, and carbon metrics

Annex A: Scores for each organisation reviewed for their engagement level

Engagement level (low to high)	Details
0	No specific engagement
1	Engagement with other initiatives (memberships, signatories)
2	Reports i.e. research reports mentioning the topic areas of interest., or Guidelines relating to the topic areas of interest e.g. repointing guidance on biodiversity
3	Active projects (ongoing projects mentioning the topic areas of interest)

Organisations were scored on a points basis from 0-3 for each topic on the level of engagement

Key Players	Type	Role of the organisations	B	S	W	C
Association of Chartered Certified Accountants (ACCA)[1]	Professional Body	• promoting the role of professional accountants in modern economies • providing a route for trainees to gain professional accountancy qualifications • representing the interests of qualified accountant members • performing some regulatory and disciplinary activities • supporting standard-setting activities, eg through commenting on proposals • sponsoring and originating research into business and accounting issues • generally acting in the public interest (eg commenting on proposed legislation and tax rules).	2	0	2	2
Institute of Chartered Accountants of Scotland (ICAS)[1]	Professional Body		0	0	1	1
Institute of Chartered Accountants in England & Wales (ICAEW)[1]	Professional Body		2	0	1	3
Chartered Institute of Management Accountants (CIMA)[1]	Professional Body		1	0	1-2	1-2
International Federation of Accountants (IFAC)[1]	Professional Body		0	0	0	1
The Sustainability Accounting Standards Board (SASB)[1,3]	Standard Setter	in sustainability reporting, creating a framework for reporting sector-specific information.	2	2	2	2
The International Accounting Standards Board (IASB)[1]	Standard Setter	in financial accounting, setting the rules and guidance that professional accountants follow when preparing financial statements	0	0	0	0

Key Players	Type	Role of the organisations	B	S	W	C
Climate Disclosure Standards Board13	Framework that includes aspects relating to the natural environment	Reporting framework	1	0	1	2
Global Reporting Initiative[1,3]	Framework that includes aspects relating to the natural environment	Developing a Sustainability Reporting Framework – a reporting system that provides metrics and methods for measuring and reporting sustainability-related impacts and performance	2	0	2	2
International Integrated Reporting Council (IIRC)[1]	Framework that includes aspects relating to the natural environment	developing, and now promoting, an Integrated Reporting Framework covering six capitals – including natural capital	1	0	1	1
International Organisation for Standardisation (ISO)	Standard Setter	Provide specifications for products, services and systems, to ensure quality, safety and efficiency.	0	2	2	2
Natural Capital Coalition NCC[1,2]	Framework that includes aspects relating to the natural environment	The NCC framework the Natural Capital Protocol is designed to help generate trusted, credible, and actionable information for business managers to inform decisions	3	0	1	1
Natural Capital Finance Alliance NCFA[1,2]	Framework that includes aspects relating to the natural environment	Working Group III: Accounting for natural capital Working Group IV: Disclosing and reporting on natural capital	3	0	3	1
TOTALS			**17**	**4**	**17.5**	**20.5**

* The level of engagement for each organisations was analysed through a combination of the following (see superscripts for each organisation in **Error! Reference source not found.**1):

- Searching for references to biodiversity, water, carbon and soil within insight web pages for each organisation
- To review, where applicable, the membership/signatories, supporters and partners of different organisations
- Finally for three organisations some additional data was obtained during face-to-face or telephone interviews

Table 1: Scores for each organisation reviewed for their engagement level.

Annex B: List of organisations involved in measurement and value decision-making support

Organisation	Type	Review	Other relevant information concerning partners or other resources
NCFA	MEM	Looked at all implementation pages, signatories and supporter's lists	
NCC	MEM	Looked at project page and membership list	
WBCSD	MEM	Looked at membership list, four pathways and links under each of: Energy: water stewardship and GHG management Food and land use: Biodiversity Measurement, Valuation and Reporting, water stewardship, smart water agriculture Cities and mobility: water stewardship, GHG management, zero emission cities and WASH Redefining value: Natural Capital Protocol and Non-financial measurement and valuation	
CERES	MEM	Looked at company network members, initiatives and resources pages	
CCI	CHAR	Looked at Projects page (and relevant details for projects mentioning biodiversity, etc.) also "About us" pages	Partners: UNEP, BirdLife, IUCN, WCMC, Cambridge, FFI, TRAFFIC, tropical biology association The Cambridge Conservation Forum, RSPB, University of Cambridge, BTO
Natural Capital Project	NGO	Software and resources pages, also partnership page	Partners: Stanford Woods Institute for the Environment, Stanford department of biology, Nature Conservancy, WWF, Institute of Environment Minnesota.
B-Team	NGO	Research and insights pages	
CI	CHAR	Business and sustainability programme	Note the website also had >700 peer reviewed articles in journals, case studies showing policy conflict with nature in specific countries, other specific conservation projects in particular areas, details a number of specific funding streams.
Nature Conservancy	CHAR	Looked at science and priorities pages and working with company's page (this suggests that only a sample of businesses is shown)	Number of specific scientific journal articles and refs to specific case studies, number of investments and funds to protect nature (focus on impact investment). Database of over 200 scientific journals

Organisation	Type	Review	Other relevant information concerning partners or other resources
			available with search capabilities.
CEF	MEM	Looked at programmes, and research pages + membership pages	Note CEF also give awards: C.K. Prahalad Award for Global Sustainability Business Leadership. There is a specific Sustainability Leadership Development Program, There are links to the NCC business hub.
WWF	CHAR	Viewed “Our work” page, and links from this to tools and information	Member numbers: mix of featured partners and data on those who funded WWF for work in relation to their sustainable business (2014) corporate engagement report.

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