

Is natural capital a material issue?

An evaluation of the relevance of biodiversity and ecosystem services to accountancy professionals and the private sector



We are on the brink of a potential crisis from the combined effects of ecological degradation and population growth. Natural resources on which society and business are dependent are being lost at an unprecedented rate. This loss of natural capital is posing a new array of risks to business ranging from increasingly severe competition for access to resources, to tightening regulation and greater and more costly hurdles to accessing finance. The Rio+20 meeting saw over 50 countries and 89 private sector organisations make formal commitments on natural capital. A trend is emerging that attempts to use accounting practices to give better understanding of the implications of the loss of natural capital for governments and for business.

How prepared is the accounting profession to respond?



About ACCA www.accaglobal.com

ACCA (the Association of Chartered Certified Accountants) is the global body for professional accountants, supporting 154,000 members and 432,000 students throughout their careers, and providing services through a network of over 80 offices and centres. ACCA works to strengthen a global profession that is based on the application of consistent standards, which ACCA believes provide the best support for international business and the desire of talented people to have successful, international careers. ACCA champions the needs of small and medium-sized business (SMEs) and emerging economies, and promotes the value of sustainable business.



About Fauna & Flora International www.fauna-flora.org

Fauna & Flora International (FFI) protects threatened species and ecosystems worldwide, choosing solutions that are sustainable, on the basis of sound science and taking account of human needs. Operating in more than 40 countries worldwide – mainly in the developing world – FFI saves species from extinction and habitats from destruction, while improving the livelihoods of local people. Founded in 1903, FFI is the world’s longest-established international conservation body and a registered charity. Through its global corporate partnerships, within the Business and Biodiversity Programme, FFI aspires to create an environment where business has a long-term positive impact on biodiversity conservation. FFI leads the **Natural Value Initiative (NVI)** collaboration (www.fauna-flora.org/initiatives/nvi). To date, the NVI has released a series of valuable publications and tools that address biodiversity and ecosystem services within the finance, extractive, pharmaceutical, and agricultural sectors.



About KPMG www.kpmg.co.uk

As sustainability and climate change issues move to the top of corporate agendas, KPMG in the UK’s Climate Change and Sustainability Services (CC&S) practice assists organisations by providing sustainability and climate change Assurance, Tax and Advisory services to organisations, helping them apply sustainability as a strategic lens to their business operations in order to better understand the complex and evolving environment, optimising their sustainability strategy.

For more information, please visit our website:

www.kpmg.com/UK/en/services/Audit/Pages/ClimateChangeandSustainabilityServices.aspx



Contents

- Foreword 4
- Executive summary 6
- 1. Introduction 10
- 2. Biodiversity, ecosystem services and corporate performance 11
- 3. Biodiversity and ecosystem services as a business risk and opportunity 14
- 4. Are biodiversity and ecosystem services issues material? 19
- 5. Biodiversity and ecosystem services in reporting 23
- 6. Valuing biodiversity and ecosystem services – trends and current practice 28
- 7. Conclusions and recommendations 34
- Appendix 1: Interviews 36
- Appendix 2: Financial statements and Financial reporting standards 37
- Appendix 3: Disclosure survey of high-risk sectors 41
- Authors 42
- Endnotes 43



Foreword

Business and government leaders from around the world are increasingly sounding the alarm about the significant impact of human activities on the natural environment – affecting its capacity to provide the goods and services we rely upon, and consequently resulting in a clear cost to business. Such is the concern of business and government that the recent Rio+20 UN conference on sustainable development saw CEOs of 39 financial institutions, including banks, investment funds, and insurance companies, make a formal commitment to work towards integrating natural capital considerations into their products and services.

Shareholders are becoming increasingly engaged with the issue. Alongside this, governments are exploring regulatory or policy changes to encourage the sustainable use of biodiversity and ecosystem services (BES) through the development of frameworks for national ecosystem services accounting.

The commitment at Rio+20 demonstrates the growing realisation that all economic activity is either directly or indirectly linked to natural capital, and action is needed. Nonetheless, this link has yet to be measured and addressed widely by the corporate sector. As all aspects of business are ultimately linked to and influenced by trends in natural capital, this highlights a risk to business, which could ultimately lead to business failure.

The question remains: how do we effectively measure, assess and report to business on the economic impacts of natural capital on business?

ACCA has long recognised that companies ignore the need to account for non-financial issues: natural capital is no exception. The accountancy profession and the business world need to start urgently considering the extent to which they are drawing down natural capital and how the erosion of such capital will affect business. New accounting, valuation and reporting techniques are required; different approaches to risk identification, materiality processes and the internalisation of externalities are needed.

ACCA, together with its partners KPMG and Fauna & Flora International, has been exploring the relevance of natural capital to accountancy professionals and the corporate sector. This report aims to continue to show the relevance of non-financial accounting to its members and students, as well as demonstrating the tangible role the profession can play in managing corporate impacts and dependencies on natural capital. It demonstrates how some among the business community are integrating natural capital into their decisions, and that accounting for it is paramount.

Helen Brand, Chief Executive, ACCA



Nature underpins business in countless ways. For many years humanity has failed to place a value on the resources obtained from the environment – freshwater, healthy soils, stable climates, pollination. Our days of securing such resources at no cost are numbered. As biodiversity and ecosystems are degraded, the ecosystem services that are derived from them (and form a large part of the natural capital on which we rely) decline. Society, and business as a part of that, is increasingly living off the capital of the natural world rather than the interest. Basic economic theory suggests that this is unsustainable.

FFI welcomes a move by regulators to understand the true value of these services to mankind and business and to take steps to protect them. Such steps are giving rise to a range of risks and opportunities for businesses. These are hitting their bottom line. As the issue becomes increasingly material to companies, it will increasingly feature in their risk analyses and disclosures. FFI believes that the measurement and disclosure of this issue is absolutely key to enabling stakeholders such as investors, government and civil society to hold to account poor performers while rewarding those who adopt a proactive stance on the issue.

Mark Rose, CEO, Fauna & Flora International



KPMG's UK Climate Change and Sustainability practice helps clients to understand how global sustainability mega-forces affect their businesses and to implement sensible solutions that reduce the risks and unlock opportunities. 'Ecosystems and Biodiversity' is one of ten mega-forces that KPMG highlighted in the report *Expect the Unexpected*, published earlier this year; KPMG is convinced that businesses will increasingly be held to account for their impacts on the natural environment and that they need to think now about how they should respond.

Further evidence of the trend came at the recent Rio+20 UN Conference on Sustainable Development, where the CEOs of 39 financial institutions, including banks, investment funds, and insurance companies, committed to working towards integrating natural capital considerations into their products and services. This means they will take account of ecosystem impacts when deciding whether and how to provide finance.

As a result, many businesses could find that their impacts on nature directly affect their credit worthiness, balance sheets and company values within the next five to ten years, as moves to place an economic value on 'natural capital' accelerate.

With that in mind, urgent work should be done to find practical ways to assess and report on the natural capital impacts of business and to use those assessments in formulating future strategy. CFOs and accounting professionals must be at the centre of this work, which is why KPMG's UK Climate Change and Sustainability practice, has been pleased to join with ACCA and Flora & Fauna International on this important report. By setting out a series of recommendations on natural capital loss, materiality and disclosure, the report makes a timely and useful contribution to this process.

Vincent Neate, Head of Climate Change and Sustainability, KPMG in the UK





Executive summary

This report investigates the concept of materiality and how it is used to identify issues for management and disclosure. It is aimed at accountancy professionals and business leaders. It explores the extent to which materiality definitions currently reflect the increasing significance of **natural capital** as a business issue. A survey of over 200 accountancy professionals, interviews with CFOs/senior management from eight major companies, a disclosure survey of corporate reporting by 40 organisations in specific sectors, and desk-based research into relevant literature and work in the field were all undertaken as part of this work. The report focuses on **biodiversity and ecosystems**, which are specific constituents of natural capital that give rise to **ecosystem services** (see **Box 1** for definitions of these scientific terms, see **Box 4**, page 11 for more details). The report does not consider the specific impacts on geological resources as these are routinely included in market transactions and accountancy practices.

Natural capital is the stock of capital derived from natural resources such as biological diversity and ecosystems, in addition to geological resources such as fossil fuels and mineral deposits. It provides the ecosystem products and services that underpin our economy and provide inputs or indirect benefits to business.

Biodiversity and ecosystem services (BES) are in decline globally. This trend is predicted to continue as the world's population grows and demands on natural resources increase (see **Box 2**). Loss of BES exposes the corporate sector to a range of new risks and opportunities that can affect profit, asset values and cash flow. Yet BES issues are often overlooked in materiality assessments¹ owing to low or uncalculated market-based values.

The concept of materiality as a driver of action

As part of overall corporate governance, companies may go through a risk-prioritisation process to identify those issues on which to focus management effort. Further filters may then be employed if companies choose to disclose specific issues to stakeholders (see **Figure 1.1**).

Box 1: Definitions of biodiversity and ecosystem services (BES)

Biodiversity: The variability among living organisms from all sources at a species, habitat and genetic level – a constituent of natural capital.

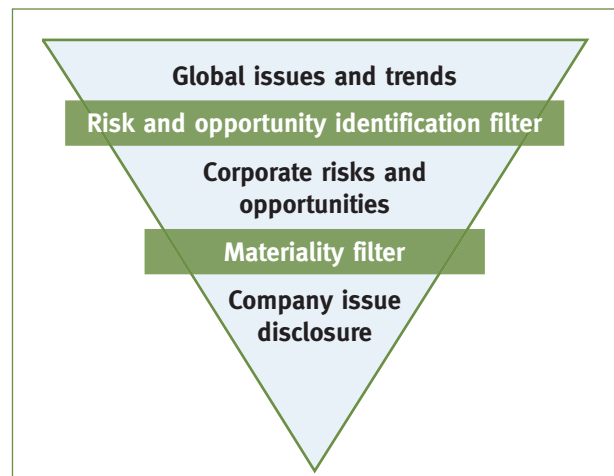
Ecosystem: A dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit, e.g. ecosystems include deserts, coral reefs, wetlands or rainforests.

Ecosystem services: The benefits, closely dependent on biodiversity, which human beings obtain from ecosystems.

Box 2: The value of ecosystem services (ES)

- The loss of the pollination services from bees in Britain would cost the UK economy GBP 1.8 billion per annum²
- Conserving forests avoids greenhouse gas emissions worth US\$ 3.7 trillion over the long term (net present value)³
- The costs of cumulative losses of ecosystem services in the 50-year period to 2050 will be equivalent to 7% of GDP by 2050⁴.

Figure 1.1: Risk and opportunity identification



“ Only a very short time ago, we were drawing blank looks when we mentioned natural capital accounting... At Rio, everyone is talking about it.”

Rachel Kyte, Vice President for Sustainable Development, World Bank

Material issues are those issues that could influence the users of financial accounts. Key stakeholders such as investors still largely judge corporate performance on the basis of measures of financial materiality. Many environmental and social issues, including BES, are rarely considered to be material by companies, despite increasing concern from civil society. The concept of materiality underlies principles of corporate disclosure. Unless the materiality of BES as an issue can be demonstrated, the arguments for its inclusion within corporate disclosures, and by association corporate strategy and management systems, are weak. Yet action by civil society suggests that BES loss is an increasingly significant issue for business and society as a whole.

A changing landscape of risks

The Principles for Responsible Investmentⁱⁱ show that 50% of company earnings could be at risk from environmental externalities – equivalent to 11% of global gross domestic product.⁵ In addition, full environmental costs of production in 11 key industry sectors could account for a considerable proportion of earnings (earnings before interest, taxes, depreciation and amortisation – EBITDA), this would have amounted to 41% in 2010.⁶ It is becoming increasingly accepted that a significant volume of financial flows are not accounted for in corporate accounts. Furthermore, it is becoming clear that the costs of these externalities are being borne primarily by governments and society more broadly. At least some of these externalities will at some point be internalised. Thus, the links between BES and corporate value through impacts on share price are strengthening. Shareholders are becoming increasingly engaged on the issue. Alongside this, governments are exploring regulatory or policy changes to encourage the sustainable use of BES through the development of frameworks for national ecosystem services accounting and by evaluating the status and economic value of ecosystem services.

Natural capital and materiality

As shareholder attention on BES issues grows, these issues are beginning to feature in management disclosure and analysis – the qualitative part of the annual report and accounts, or within separate sustainability reports. There are also some instances where an item or issue might be measurable in financial terms and therefore included in the quantitative elements of the accounts.⁷

- There have been planning restrictions as a result of impacts on natural capital and associated decreases in company share price. For example, in 2012 the Canadian Gold mining company, Infinito Gold, lost permission to develop a mine as a result of the potentially significant impacts on agriculture, forests and endangered species.⁸ This led to a decrease in share value of 50% (see **Figure 4.1**, page 20) and a reference in the annual report to material uncertainties regarding the company's ability to continue as a going concern.⁹
- Clean-up costs from the 2010 Gulf of Mexico oil spill and associated compensation claims for ecological damage have affected both BP's balance sheet and its profit and loss. The company's 2011 annual report included a \$3.5 billion provision related to clean-up costs and a \$7.8 billion provision related to litigation and claims associated with the spill.
- There have been delays in securing permission to develop as a result of concerns about natural capital. For example, Newmont Mining Corporation in Peru experienced significant delays as a result of concerns about the impacts of the mine on water availability. This not only resulted in costs associated with the delay, but also required an investment of approximately \$150 million from the investment partner, Minera Yanacocha.¹⁰

⁵Source: <http://blogs.worldbank.org/voices/rios-buzzing-about-natural-capital-accounting>

ⁱⁱThe United Nations-backed Principles for Responsible Investment have been devised by the investment community to provide a voluntary framework by which all investors can incorporate ESG issues into their decision-making and ownership practices and so better align their objectives with those of society at large.

Key findings

Perceptions of risks and opportunities associated with BES are variable within the accountancy profession:

not all companies that are considered high risk in terms of their impacts or dependence on BES by stakeholders evaluate that risk. Nonetheless, some of the accountancy profession routinely include such issues within business risk evaluations (see **Box 3**). Furthermore, a small but significant proportion of companies, such as Iberdrola and EON, include BES in their materiality reviews. In general, however, the focus on financial measurement for determining materiality acts as a barrier to the identification of BES issues as material.

Box 3: Highlights from a survey of the ACCA membership

A survey was sent out to the ACCA membership to gather their views and activities on natural capital. Respondents were skewed towards those in senior management posts, such as CFOs, CEOs or other senior managers.

Key findings included:

- 60% of respondents agreed that the natural world was important to their business
- more than half of the respondents had included natural capital issues in their company's business risk evaluations at some point
- 49% identified natural capital as a material issue for their business and linked it to operational, regulatory, reputational and financial risks
- there was a relatively low response rate of less than 1% (218 members) compared with an average response rate of around 3% in other ACCA surveys.

Corporate BES disclosures, as currently practised, are too limited to provide insights into risk management: a handful of companies in sectors with high environmental impact are reporting substantial detail on BES, but the majority are reporting little or no information owing to

the perceived immateriality of the issue. In fact, this is at odds with stakeholder expectations, including those of some of the investment community who are looking to companies to disclose on the matter.

Existing financial reporting and disclosure standards can be applied to the issue of BES:

in some cases, an item or issue relating to BES is measurable in financial terms and, therefore, included in the quantitative elements of the accounts. The interpretation and application of International Financial Reporting Standards (IFRS), such as those on business combinations, and International Accounting Standards (IAS), such as those on impairment of assets, agricultural or intangible assets, could be influenced by natural capital loss in some sectors. In practice, many significant risks and opportunities are unquantified, cannot be easily valued, and are therefore excluded from the accounts.

Companies in a range of sectors are exploring the use of valuation techniques to assist in decision making, alongside other means of identifying and evaluating risk:

some, such as Rio Tinto and Eni, are testing the use of environmental economic valuation in informing business decisions; others are using stakeholder dialogue or enhanced environmental impact assessment processes that include consideration of BES.

There are a number of barriers to corporate action: these impede companies from effectively determining risk and opportunity exposure on BES. These barriers include the lack of a standardised business case, low and lacking market values for BES and certain accounting principles. The accounting and business communities also lack awareness on natural capital issues.

Understanding of the concepts and terminology: although there is broad understanding of terms such as biodiversity and ecosystems, the terms ecosystem services and natural capital are less well known, reflecting the relatively recent emergence of these issues as business risks.

Recommendations

Targeting its two key audiences – CFOs and accountants – this report’s recommendations are focused on the five key themes that form the overarching issues discussed within the report as follows:

- Engage with experts and develop skills: follow guidance being produced by expert groups on how to address BES.
- Identify externalities to internalise impacts on BES.
- Define materiality to ensure that all risks and opportunities posed by BES are picked up.
- Consider the use of valuation methods if and when appropriate.
- Enhance disclosures on natural capital.

CFOs should:

- engage with experts to understand the level to which their organisations depend on natural capital; this would include understanding the degree to which company revenues, costs and going concern status rely on natural capital (both directly and indirectly)
- ensure that risk and materiality assessments consider natural capital; by doing so, CFOs will be able to determine if the various risks posed by declining natural capital will have a material impact on their organisations and implement mitigation strategies to avoid negative impacts on corporate value
- work with finance teams to develop the skills and capacity for accurate assessment of a company’s impact or dependence on natural capital
- disclose material natural capital impacts and dependencies, guiding the development of robust disclosure and assurance systems to ensure data quality
- use their board position to educate other board members on the importance of BES within key management and strategic decisions

- consider whether natural capital can be incorporated into financial accounts, and engage with the IASB or local accounting standard setters on how current accounting standards can be improved to address the topic more fully
- engage with organisations such as IIRC or NCDⁱⁱⁱ that want to develop tools to account for natural capital
- learn from those already engaged with these issues, and consider how the tools that are used by these companies can be applied to their own operations.

Accountants should:

- draw on their core skills and expertise in accountancy to contribute to the development of potential natural capital accounting methodologies to aid the quantification and management of company externalities
- call on accountancy bodies to provide guidance on how to address natural capital within company annual reports and accounts, as well as sustainability reports
- follow and track new guidance that becomes available within the area of natural capital
- engage with experts to increase skills through workshops and training
- pilot or trial natural capital accounting methodologies with clients, where appropriate, and use this experience to work with regulators on disclosure guidance and assurance practices.

An emerging challenge

The challenge for the accountancy profession will be to determine when the loss of natural capital will require an enhanced understanding and approach to business-risk assessment and corporate disclosure. Doing so too late may lead to failures when anticipating future risks and their associated costs to business. It may also lead to overlooked opportunities to increase supply chain resilience, secure and maintain licences to operate, and enter new markets.

ⁱⁱⁱ Natural Capital Declaration



1. Introduction

“To reflect their significance, the challenge to CFOs and accountants is to ensure BES related externalities are incorporated into risk and materiality assessments, financial accounts and reporting cycles.”

Helen Brand, Chief Executive, ACCA

The Association of Chartered Certified Accountants (ACCA), KPMG and Fauna & Flora International’s Natural Value Initiative (NVI) have come together to investigate the concept and existing use of materiality and its conflicts in light of the increasing significance of natural capital as a business risk. This report focuses specifically on issues of biodiversity and ecosystem services (BES), which form a part of natural capital. It asks the question, are current approaches and guidance on BES enough to enable corporate management of risk and opportunity?

This report is aimed at chief financial officers (CFOs), accountancy professionals and business leaders as key gatekeepers of corporate strategy, accounting, reporting and disclosure. It explores the current response to BES issues within the accountancy profession.

The approach used combined desk research with other methodologies.

- Semi-structured interviews were conducted with eight CFOs and senior managers (see **Appendix 1** for details) covering the following questions:
 - o How are company risk and materiality assessments performed, and how do they relate to BES?
 - o What is the impact of BES-related issues on their businesses?
 - o How well equipped is the current financial and sustainability reporting model to consider such issues?
- A review was carried out of disclosure practices within 40 companies across four sectors broadly considered to be high risk with regard to BES: forestry, food

production, utilities and construction. The review was based on annual reports, sustainability reports and website disclosures.

- A survey of the ACCA membership was conducted on natural capital issues (see **Box 5**, page 13), with responses from over 200 professionals.

The work was guided by an expert panel with representatives from industry, academia and the accountancy profession. The rest of the report is divided into the following sections.

- **Chapter 2** explains what is meant by natural capital and how it links to BES, business risk, strategy and corporate valuation and performance.
- **Chapter 3** explores BES as a business risk and opportunity, and examines corporate approaches to identifying and understanding these risks and opportunities.
- **Chapter 4** considers the materiality concept and how it is currently applied to BES issues.
- **Chapter 5** reviews current reporting practices, standards and guidance on BES and identifies potential gaps and areas for development.
- **Chapter 6** considers how BES are currently valued within company disclosures, and the development and adoption of new valuation methodologies.
- **Chapter 7** sets out the report’s conclusions and a series of recommendations for CFOs and accountancy and audit professionals.



2. Biodiversity, ecosystem services and corporate performance

This section defines key terms and concepts used within this report and set out the links between natural capital, biodiversity and ecosystem services (BES) and overall corporate performance.

Biodiversity, ecosystem services and natural capital

Stocks of **capital** interact to support economic activity. Such capital can be classified into six categories: manufactured, human, social, intellectual, financial and natural.¹¹

Natural capital is the stock of capital derived from natural resources, such as biological diversity and ecosystems along with geological resources such as fossil fuels and mineral deposits. It provides the ecosystem products and services that underpin the global economy and provide inputs or indirect benefits to business (see **Box 4**).

This report focuses on **biodiversity and ecosystems**, specific constituents of natural capital that give rise to ecosystem services. Geological resources are not considered because they are routinely included in market transactions and accountancy practices.

Business is dependent on ecosystem services

Figure 2.1 (page 12) shows the links between natural capital, BES and corporate value. It shows that, in addition to being reliant on the other types of capital (i.e. human, manufactured, etc.) that are perhaps more familiar to the corporate world, business is dependent on the BES aspects of natural capital and the ecosystem services derived from them.

Companies also have the potential to have impacts on sources of natural capital through their activities and outputs. Importantly, these impacts can be either positive or negative, resulting in changes in corporate value such as improved asset values or decreasing profit margins.

Box 4: Definitions

A number of the terms used throughout the report are defined below.

Natural capital: The stock of capital derived from natural resources.

Biodiversity: The variability among living organisms from all sources at a species, habitat and genetic level – a constituent of natural capital.¹²

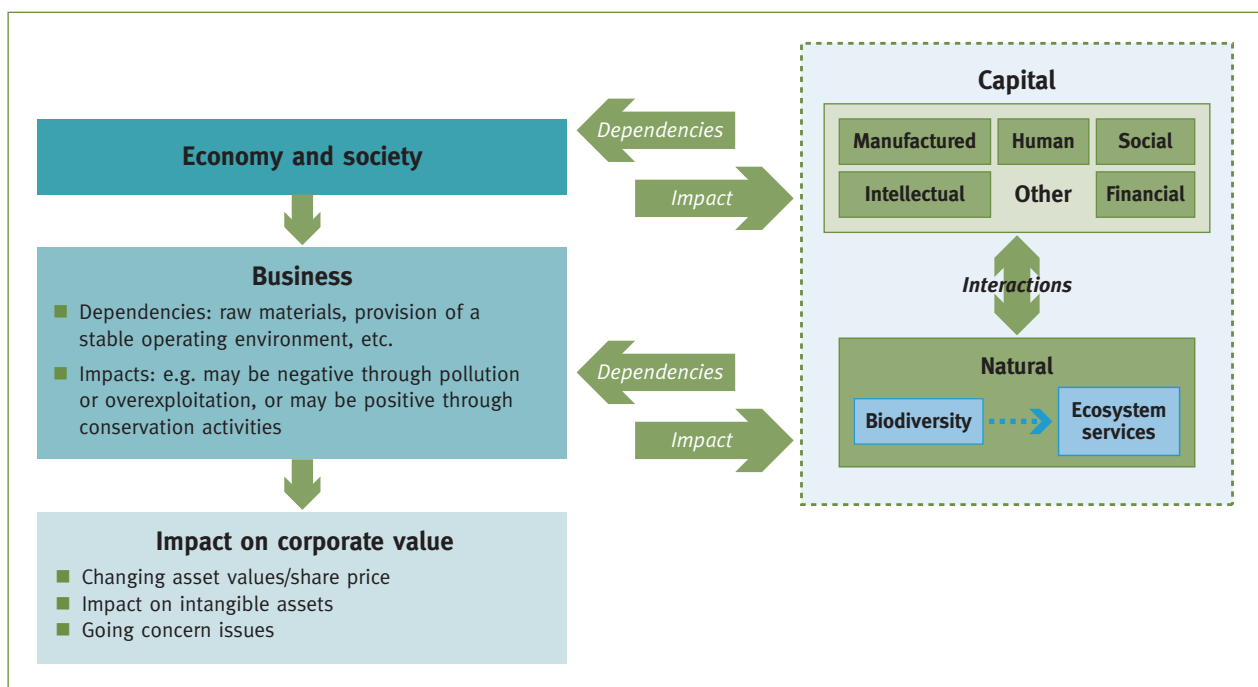
Ecosystem: A dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit,¹³ e.g. ecosystems include deserts, coral reefs, wetlands or rainforests.

Ecosystem services: The benefits, closely dependent on biodiversity, that human beings obtain from ecosystems. These can be classified into four categories:

- *provisioning services:* goods that ecosystems produce, such as food and water
- *regulating services:* natural processes regulated by ecosystems such as flood and disease control
- *cultural services:* benefits obtained from ecosystems such as recreation and spiritual values
- *supporting services:* services that maintain the conditions for life on Earth and all other ecosystem services, e.g. photosynthesis.¹⁴

Biodiversity offset: Measurable conservation outcomes resulting from compensation for significant residual adverse biodiversity impact, in particular, those that persist even after appropriate prevention and mitigation measures have been taken.¹⁵

Figure 2.1: Links between natural capital, biodiversity, ecosystem services and corporate value.



Links between BES and performance

Two-thirds of the biodiversity and ecosystem services (BES) on which society and business relies are either degraded or in decline.¹⁶ The costs of these cumulative losses of BES from 2000 to 2050 will be equivalent to 7% of GDP by 2050.¹⁷ This continued loss of BES will have implications for long-term business performance.

BES are aspects of natural capital that are rarely valued by financial markets despite their potential to influence corporate performance significantly by exposing organisations to different risks and opportunities. For example, a Volkswagen plant in Puebla, Mexico, faced significant water scarcity issues. The company helped fund the reforestation of the catchment area that feeds the water table and, thus, has avoided significant loss of invested capital. Without this investment it is

unlikely that the plant would remain economically viable owing to high water costs.¹⁸

The links between BES and corporate value through impacts on share price are strengthening as the extent of corporate reliance on BES becomes clearer. These links are likely to strengthen further as governments take steps to maintain stocks of natural capital in the face of increasingly competing demands of resource users. Over 30 countries now have some form of legislation in place to enable compensation for the impacts of development on BES. The emergence of national-level reviews of the status of BES in countries such as Brazil, India, the UK, Germany and the Netherlands may lead to further regulation¹⁹ as governments act to address the findings. In the UK, for example, a National Ecosystem Assessment^{iv} showed

^{iv}The UK National Ecosystem Assessment (UK NEA) was the first analysis of the UK's natural environment in terms of the benefits it provides to society and continuing economic prosperity. Part of the Living With Environmental Change (LWEC) initiative, the UK NEA commenced in mid-2009 and reported in June 2011.

“Indiscriminate draw-down of Natural Capital poses a risk to our business today and much more so in the future. The severe under valuation and degradation of Natural Capital constitute a real challenge to businesses in general, in achieving longer term strategic objectives.”

James Singh, Executive Vice President &
Chief Financial Officer (recently retired), Nestlé

that 30% of the UK’s ES were degraded or in decline. The UK has put in place a range of advisory groups and pilot projects to inform future policy action to address this decline.²⁰

The issue is changing from one of reputational risk, impacts on intangible assets and weak links to shareholder value, to one of operational, financial, and market risk and competitive advantage, all of which have greater links to shareholder value. Hence, for some sectors, BES loss is becoming an issue that can constrain corporate success through impacts on corporate value and corporate performance. Associated British Ports, the UK’s largest port operator, lost 10% of its stock market value after the UK government prevented its development of a container terminal. The decision was made as a result of concerns over the potential impact on important wildlife.²¹

How does an ecosystem services (ES) approach build on traditional environmental management?

ES approaches are a holistic way of examining environmental change. Analyses include understanding current ES availability and identifying those who use or rely on them. This can be extended to consider the impact of new projects, policies and schemes and the corresponding change in ES, in terms of both the level and change in the types of ES available. Certain categories of ES are underpinned by ‘supporting services’ and these in turn are underpinned by biodiversity. ES approaches consider the broader needs of stakeholders and the overall system in which the impact is occurring, rather than a single output or impact. These approaches can be used to build an understanding of access to ES in the future and may provide greater insights into future limits of natural resources. Thus, the outputs of such analyses can aid the development of regulatory requirements, risk-mitigation strategies and opportunities.

The next section will explore how the issue of BES has become increasingly important to business, and consider how the issue links to corporate risk and opportunity.

Box 5: Insights from the ACCA membership survey

The global ACCA membership was surveyed to capture members’ views on natural capital. In all, 218 members responded (less than a 1% response rate). A normal response rate is in the region of 3%. A significant proportion (18%) of these were senior personnel– a higher level than for most ACCA member surveys (approximately 13%), suggesting that the issue had captured attention at a senior level.

Key findings

The issue is perceived to be important, but not broadly understood; the low response rate suggests that the accountancy profession does not consider natural capital issues routinely.

- ACCA members had some understanding of the terms ‘biodiversity’ and ‘ecosystems’.
- The term ‘ecosystem services’, however, was less well recognised.
- 60% of respondents agreed that the natural world was important to their business.

Key messages

- BES are part of natural capital, and business is dependent on them.
- The decline in BES is giving rise to a range of risks and opportunities to which business is exposed.
- Current knowledge of these issues and risks is limited within the accountancy profession.



3. Biodiversity and ecosystem services as a business risk and opportunity

The following section sets out the business risks and opportunities associated with BES. It identifies the status of BES risk evaluation, and considers the tools available to companies.

Risk and opportunities management

Undertaking a broad evaluation of corporate risk and maintaining a risk register are considered routine parts of strong governance procedures. Companies must go through a risk prioritisation process to identify those issues on which to focus management effort. Further filters are then employed to decide which issues are sufficiently material for disclosure in communication to stakeholders (see **Figure 3.1**).

The 2006 reform of UK Company Law²² made specific reference to the fact that company directors have a responsibility to consider a range of issues that influence corporate performance, including environmental issues, and, in the case of quoted companies, are expected to report on such issues where to do so is necessary for an understanding of the development, performance and position of the business.

Linking BES loss and risk and opportunity management

Impacts and dependence on BES can create business risks and opportunities through changes in: the supply of inputs or resources; regulation and licensing conditions; and customer demand and access to markets, including the securing of finance and insurance (see **Table 3.1**)^{23,24,27} Financiers from the international agribusiness company, Olam, have indicated that they examine BES management when making decisions on plantation expansion, believing that a proactive stance on BES can facilitate access to finance.

By integrating BES issues into decision making and forward planning, businesses can enhance their performance by reducing and mitigating the associated risks, and realising opportunities.²⁵

“ If the UK Company Law Reform were conducted now, it would undoubtedly make specific reference to biodiversity and ecosystem services risks. ”

Mike Kelly, Head of Corporate Social Responsibility, KPMG in the UK

Figure 3.1: Risk and opportunity identification



3. Biodiversity and ecosystem services as a business risk and opportunity

Table 3.1: Risks and opportunities associated with BES²⁶

Type	Risks (blue) and Opportunities (green)	Examples
Operational	Scarcity and/or reduced quality of raw materials, reduced output and productivity, disruptions to business operations, supply chain risks	<p>Profit impacts: Loss of access to pollination may lead to declining crop yields; a study in Costa Rica showed coffee yields to increase by 20% in proximity to forest edges, where access to pollinators was higher.²⁷ This may lead to a need to write down stock value and affect profits of companies supplying those pesticides recently implicated in the global loss of pollinators. Four European Union countries have enforced suspensions/bans on the use of these pesticides.²⁸</p> <p>Raw material quality: In order to protect the quality of the raw water United Utilities supplies to its customers, the company has implemented the Sustainable Catchment Management Programme. The programme started in 2005 and seeks to restore 20,000 hectares of land owned by the company, which will improve the quality and reliability of the water table.²⁹</p>
	Improvement to quality of raw materials, increased output and productivity, sustainability of business operations, supply chain reliability	
Regulatory and legal	Restrictions on land access, litigation, resources quotas, pricing and compensation mechanisms	<p>Litigation risks: In 2011, Australian logging company, Concord Pacific Limited, was ordered to pay up to US\$97 million for environmental damage caused by illegal logging it had carried out.³⁰</p> <p>Anticipation of regulation: Infrastructure group Balfour Beatty has undertaken a pilot test linked to Defra's biodiversity offsetting consultation programme. The group's participation will assist in ensuring that appropriate legislation is developed, while Balfour Beatty will benefit from developing positive working relations with the government, enhancing skills, and demonstrating leadership in the field.</p>
	Land access, meeting legislation and resource quotas (including lower transition costs by early anticipation of such), proactive implementation of compensation measures	
Reputational	Potential damage to brand or the licence to operate	<p>Reputational risks: Greenpeace targeted Nestlé in a high-profile campaign linked to the company's product KitKat and its use of palm oil from sources linked to rainforest destruction. The company has since put in a range of measures to ensure sustainable sourcing of palm oil.³¹ One of the world's largest paper manufacturers, APP, has been targeted by Greenpeace following the NGO's exposé of illegal logging practices in which APP has been involved, resulting in the withdrawal/suspension of contracts from clients, including from significant purchasers such as Xerox and Danone.³²</p>
	Potential improvements to brand or the licence to operate	
Market and products	Failing to match developments in consumer preferences, failing to meet purchaser requirements	<p>Access to markets: The Union for Ethical Biotrade surveyed 8,000 people in eight countries (Brazil, France, Germany, India, Peru, Switzerland, UK, USA), finding that 85% of consumers look for natural ingredients in cosmetic products and 69% are concerned with the sustainability of ingredient sourcing.³³</p> <p>Sales growth: The launch of Unilever's Rainforest Alliance Certified tea in Australia saw 12% growth in sales.³⁴</p> <p>Purchaser requirements: UK government procurement policy requiring all timber-based products used internally to be from legal and sustainable (including BES considerations) sources.³⁵</p>
	Matching developments in consumer preferences, meeting purchaser requirements	
Financing	Increased cost of capital and/or the inability to meet lending requirements	<p>Cashflow, operating costs and licence to operate: German bank West LB recently adopted a new environmental policy which precludes the firm from financing offshore activities in the Arctic, owing to concerns about technical and environmental risks. In addition, insurer Lloyd's of London has published a report discussing the vulnerability of ecosystems in the Arctic, emphasising that the risks associated with drilling in the region are significant.³⁶</p>
	Ability to potentially reduce cost of capital and/or meet lending requirements	

3. Biodiversity and ecosystem services as a business risk and opportunity

Table 3.2: Sectoral risk, biodiversity and ecosystem services

Type of risk ³⁷	Related ecosystem services	Sector ³⁸												
		Mining	Oil and gas	Agriculture and food	Forestry	Utilities	Construction	Real estate and infrastructure	Leisure, hotels and tourism	Food and drug retailers	General retailers	Pharmaceuticals and biotechnology	Household goods	Financial services
Operational														
Scarcity or quality of raw materials: limited natural resources, e.g. timber, fish stocks, fresh water	P,R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reduced output or productivity: degraded natural processes, e.g. water cycling, soil nutrients, pollination	R,S			✓	✓	✓							✓	
Disruptions to business operations: natural hazards due to degraded ecosystems, e.g. flooding	R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Supply chain risks: impacts on downstream operators and consequently security of supply or increased costs	P,R,C,S			✓			✓	✓	✓	✓	✓	✓		
Regulatory and legal														
Restrictions on land access: restriction to operation in ecologically sensitive sites, e.g. protected areas	P,C	✓	✓	✓	✓	✓	✓	✓						
Litigation: if causing or have caused damage to ecosystems	P,R,C	✓	✓	✓	✓	✓	✓	✓			✓			✓
Resource quotas: restrictions on businesses using ecosystem services	P			✓	✓									
Pricing and compensation: growth of compensation mechanisms and price differentials linked to issue	P,R,C,S	✓	✓	✓		✓								
Reputational														
Damage to brand or licence to operate: if associated with adverse impact on ecosystem services	P,R,C,S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Market and products														
Consumer preferences: trends and preferences for products with reduced ecosystem services impacts	P,C		✓	✓	✓	✓		✓	✓	✓			✓	✓
Purchaser requirements: supply chain requirements that include safeguards on ecosystem services	P,R,C,S	✓	✓	✓	✓	✓	✓					✓		
Financing														
Cost of capital or lending requirements: restrictions on finance to companies negatively affecting ecosystem services	P,R,C	✓	✓	✓	✓	✓	✓	✓					✓	

P= Provisioning services, R= Regulating services, C= Cultural services, S= Supporting services;
 Colour code for level of risk of each sector: ■ High risk ■ Medium/High risk ■ Medium risk ■ Low risk

“ Natural resources such as timber and water are fundamental to Mondi. There is a strong link between license to operate and these issues. They are potentially an area of critical risk for the company. ”

Andrew King, CFO, Mondi

Different sectors vary in their risk and opportunity profile

Sectors vary in their exposure to BES risks and opportunities. **Table 3.2** sets out this sector variation (particularly focusing on risks), compiling the results of a series of studies from investors, advisers to the investment industry and professional services firms (as referenced in the table).

Approaches to identifying risks and opportunities

The study involved interviews with CFOs and senior managers of companies operating in high-risk sectors, or organisations that are taking a leadership position in their management of natural capital. These highlighted a range of different approaches to identifying risk and opportunities related to BES components of natural capital.

In some cases, the approach was driven largely by regulatory obligations while other approaches were much broader, taking into account the views of stakeholders from inside and outside the company.

An approach common to many of the interviewees was the use of a risk register to monitor and manage risk. Company directors reported that they would periodically review their operations and pull together a long list of all the risks affecting their businesses. In order to prioritise the risks, an estimate of the probability and financial impact of each would be made. Mitigation plans would be driven by this assessment, and the register would be tracked over time to ensure that the risk register and mitigation plans are kept up-to-date.

Barriers to understanding/acting upon BES-related risks and opportunities

A number of barriers to companies' effective determination of risk and opportunity exposure on BES were identified through interviews with CFOs, a survey of ACCA members, and through desk-based research, as follows.

- **Awareness:** the understanding of ecosystem services and their links to business performance is relatively low within the accountancy profession³⁹ – less than one-third of responding ACCA members were familiar with the term 'ecosystem services'
- **Skills:** the industry currently lacks the skills and experience to be able to understand ES issues and their potential impact on corporate value and performance – 70% of ACCA members surveyed said that they needed training on the issue. Opportunities to build this capacity are emerging through specific training courses. See **Box 7** (page 18).
- **Inherent challenges:** evaluating the risks and opportunities associated with BES is inherently difficult. Estimating their financial value for use in making decisions is challenging and methodologies to enable this are still developing.⁴⁰ Additionally, the period over which BES issues become significant may frequently exceed that over which business risks and opportunities are identified.
- **Competitiveness issues:** being a 'first mover' on BES issues could confer competitive advantage to proactive companies through differentiation, increased brand value or the anticipation of regulatory change and associated costs.
- **Metrics:** There is a lack of straightforward and internationally accepted metrics for BES issues, making them more difficult to report, manage and monitor consistently.
- **Potential for increased risks:** there is concern that measuring or valuing impacts and dependence on BES may leave companies open to additional costs, reputational risks or increased regulation.



3. Biodiversity and ecosystem services as a business risk and opportunity

Box 6: Insights from the ACCA membership survey: natural capital and business risk

The accountancy professionals who responded to the ACCA survey identified a range of risks associated with natural capital. The most significant were as follows.

- Reputational risk featured as a key concern.
- More than 50% of respondents considered disruption to physical operations, supply chain risk and regulatory risks as potentially significant or currently significant.
- 77% of respondents had identified natural capital as a significant business risk at some point, and 25% had identified such risks often or always within a business risk evaluation.
- 34% of members in sectors considered 'high risk' (as identified in Table 3.2) in terms of BES impact/dependencies have never considered natural capital issues within their business-risk evaluation.

Box 7: Case Study: Business Ecosystems Training (BET) developed for the World Business Council for Sustainable Development (WBCSD) by KPMG

WBCSD, in conjunction with KPMG and a member company steering group, developed and launched 'Business Ecosystems Training' in 2012 to improve the understanding of managers and employees of their membership company's direct and indirect impact and dependence on BES.

The course was commissioned following a survey of member companies by the WBCSD, which identified an appetite for increased awareness of BES issues and concepts. So far, KPMG has trained over 60 representatives across a range of business sectors in different countries, with other international NGOs also making use of the materials available.

Tools and guidance available

A number of approaches, assessments and tools have been developed to assist the integration of BES risks and opportunities into business performance systems.⁴¹ Business for Social Responsibility^v has undertaken a series of analyses of ecosystem-services-related tools and approaches which are useful sources of further guidance, such as the WBCSD's Corporate Ecosystem Services Review (ESR) and the NVI's *The Ecosystems Services Benchmark*.

Key messages

- BES issues are being included in the risk evaluations of some companies.
- Tools are being developed to assist companies in identifying BES risks and opportunities.
- Barriers such as lack of awareness and expertise, competitiveness issues, concerns regarding risk exposure and the long-term nature of BES risks are hampering further integration of BES into business risk and opportunity evaluations.

^vA global business membership organisation, based in the USA, that promotes sustainability in businesses.



4. Are biodiversity and ecosystem services issues material?

This section looks at the extent to which BES are considered a material issue for public disclosure, and whether or not this corresponds with those companies and sectors that have been identified by investors and other stakeholders as having material issues. The processes that companies are using to reach a conclusion on materiality are also identified.

The importance of materiality

The concept of materiality relates to issues that could influence the users of financial accounts (see **Box 8**). Sustainability reporting has its own definition of materiality, which includes impacts on broader corporate stakeholders⁴² and focuses on a broader set of issues over longer periods.⁴³

Key stakeholders, such as investors, still largely judge corporate performance on the basis of measures of financial materiality. Many environmental and social issues are rarely considered to be material by companies, despite increasing concern from civil society. BES management is one such issue.

The concept of materiality underlies principles of corporate disclosure. Unless the materiality of an issue can be demonstrated, the arguments for its inclusion within corporate disclosures, and by association corporate strategy and management systems, are weak. If a broad definition of materiality is followed that includes consideration of stakeholder views (investors, communities, civil society and government) and longer-term business risks (see **Chapter 3**), BES issues are more likely to be considered material, enabling companies to consider an emerging set of risks and opportunities.⁴⁴

Natural capital and materiality

Using the BES elements of natural capital rarely represents a direct cost of doing business unless they are used as a specific input into production, e.g. timber, but instead affects wider society in the form of environmental externalities. As a result, BES are often overlooked in traditional materiality calculations⁴⁶ owing to low values or values that are not based on markets. For example, an analysis of the value of forest lost as a result of the

Box 8: Definitions⁴⁵

Materiality: In financial reporting and auditing, an item (usually economic in nature) is material if its omission or misstatement could influence the users of the financial accounts, with ‘users’ frequently defined as shareholders, investors and lenders.

Externalities: A consequence of an action that affects someone other than the company undertaking that action, and for which the company is neither compensated nor penalised through the markets. Externalities can be either positive or negative.

Environmental externalities: include externalities to ecosystems and ecosystem services that may affect people, buildings and infrastructure, and other economic activities (e.g. from air emissions).

Chinese construction and materials industries was estimated at US\$12.2 billion⁴⁷ annually. If this is compared with the unit cost of timber using the prevailing market price, it is clear that the price paid for timber by the Chinese construction market does not reflect its true cost⁴⁸ in terms of lost ES such as watershed protection, erosion control and recreational opportunity.

The materiality of an issue is determined on the basis of its financial impact and probability of occurrence. It flows directly from broader business risk and opportunity evaluations. Interviews with a number of CFOs identified that BES issues are rarely considered material as their economic impacts are often small or occur in the future. Despite this, BES issues (see **Chapter 3**) are beginning to feature in management disclosure and analysis, the qualitative part of the annual report and accounts, as identified in a number of the companies examined in the disclosure survey of this report (see **Chapter 5**).

The survey of ACCA members suggests that 82% of risks and opportunities highlighted in company assessments are short to medium term (up to five years) with only 11% perceived as affecting businesses in the long term

4. Are biodiversity and ecosystem services issues material?

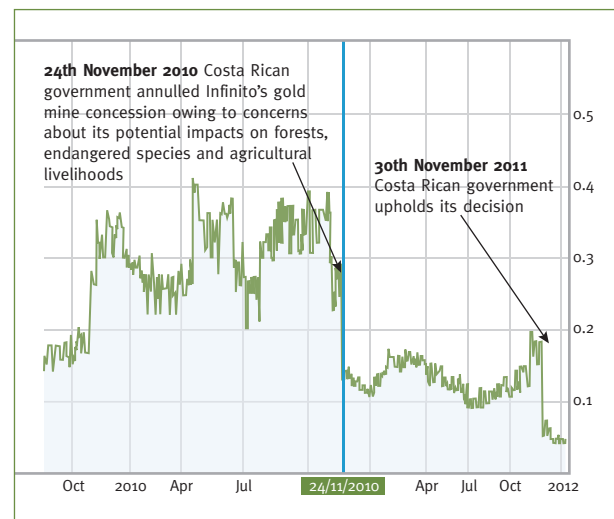
(up to ten years). Favouring short- to medium-term projections when identifying material issues tends to counter the recognition of BES issues as material because they tend to manifest over longer periods.

There are, however, some instances where an item or issue might be measurable in financial terms and therefore included in the quantitative elements of the accounts. Some examples are given here.⁴⁹

- Significant and sustained drops in share price may occur as a result of the refusal of planning permission motivated by environmental concerns. Canadian gold mining company, Infinito Gold, lost over 50% of its share value as a result of the withdrawal of a mining concession in Costa Rica due to concerns about the potential impacts on agriculture, endangered species and forests (see **Figure 4.1**). This led to a reference in the audit accounts to material uncertainties regarding the company's ability to continue as a going concern
- Clean-up costs from the 2010 Gulf of Mexico oil spill, and associated compensation claims for ecological damage, affected both BP's balance sheet and its profit and loss. In the company's 2011 annual report, a \$3.5 billion provision related to clean-up costs, and a \$7.8 billion provision related to litigation and claims associated with the spill.
- Newmont mining company in Peru experienced significant delays as a result of concerns regarding the impact of the mine on water availability. Overcoming these concerns has required a \$150 million investment from partner, Minera Yanacocha, to build water reservoirs to compensate for the mine's impact on local water supplies.⁵⁰

Such incidents may, for example, result in impairment of assets, profit reductions, and even a need for increased provisions or qualifications regarding the company's ability to continue as a going concern.

Figure 4.1: Infinito Gold lost more than half its value when the Costa Rican court annulled a gold mine concession^{51, 52}



Interest among the traditional users of financial accounts is increasing

There is evidence that interest in these issues among the traditional users of financial accounts is growing. In 2011 alone the following events occurred.

- The International Finance Corporation's performance standards were reworked to place greater safeguards on BES. This will significantly affect project finance through the 72 financial institutions currently committed to the Equator Principles. These now require companies to demonstrate no net loss of biodiversity in areas identified as 'natural habitats'. In critical habitats, a company must demonstrate a net gain in biodiversity. This may lead to increases in the level of rehabilitation provisions required at locations operating in ecologically sensitive sites. Failure to comply with the requirements of potential financiers may significantly reduce investment return⁵³ for those companies reliant on such finance.

4. Are biodiversity and ecosystem services issues material?

“Mondi is generally not being quizzed on water, ecosystem services or wetlands by investors. Some investors with specific relevant investment criteria ask questions, but these are in the minority.”

Andrew King, CFO, Mondi

- The Water Disclosure request from the Carbon Disclosure Project was supported by 354 investors with US\$43 trillion assets under management.⁵⁴
- Eight investors and advisers, collectively representing £787 billion of assets under management, released a report highlighting the risks and opportunities associated with BES in the extractive sector.⁵⁵
- A coalition of 30 investor organisations representing over US\$170 billion in assets urged the US Environmental Protection Agency (EPA) to initiate a review process under the Clean Water Act to evaluate the mine waste impacts of the proposed Pebble Mine on Alaska’s Bristol Bay watershed, which produces approximately half of the world’s commercial supply of wild sockeye salmon.⁵⁶

Forty private sector organisations, including Rabobank and National Australia Bank, have endorsed the ‘Natural Capital Declaration’, committing themselves to integrating consideration of natural capital impacts, risks and opportunities into their decision-making processes and to ‘building a global consensus for the integration of Natural Capital into private sector accounting and decision-making’.⁵⁷ This demonstrates how traditional ‘users’ of the accounts are creating a demand for more information on natural capital issues, in particular seeking reassurance that companies are managing the risks and opportunities associated with the issue.

Nonetheless, this interest has not yet filtered down to a company level: three of the eight CFOs interviewed stated that investors had shown no interest in BES issues to date. Shareholders were seen as being reactive and assuming that the company is operating responsibly unless proven otherwise. Proactive communication on the issue was not sought.

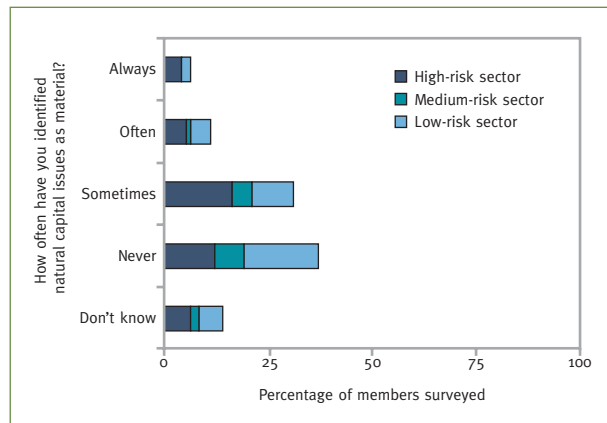
Box 9: Insights from the ACCA survey – natural capital in materiality decisions

Of the ACCA members responding to our survey:

- 49% had identified natural capital as a material issue for their business, and
- one-third of all responding members had never experienced material natural capital issues; 32% of these members are based in companies considered to be at high risk from a natural capital perspective.

For those companies that were considering natural capital within materiality assessments, the most frequently cited reasons were the management of operational, regulatory, reputational and financial risks.

Figure 4.2: How often do ACCA members identify natural capital as a material issue?



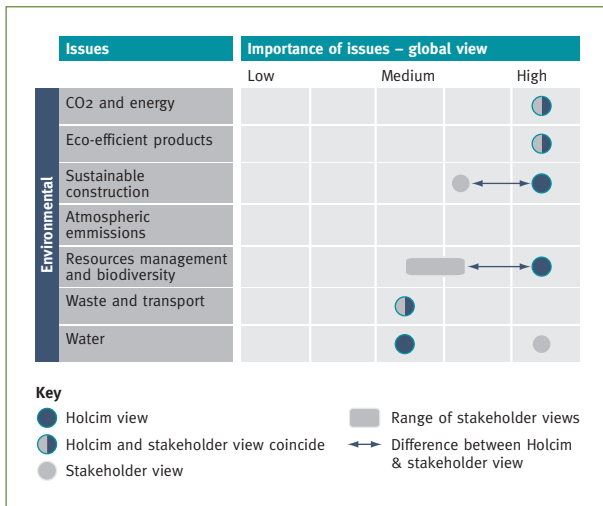


4. Are biodiversity and ecosystem services issues material?

BES as a part of materiality analysis – examples of corporate practice

A number of companies are already including BES issues within their analyses of materiality (as evident from the disclosure survey discussed in Chapter 5). Holcim, for example, has conducted a materiality review at group level since 2007 for its sustainability report. This is now supplemented with business-level risks and combined with a stakeholder analysis and consultation to provide an annual review of the issues most material to Holcim’s business. The results are summarised in a matrix, an excerpt of which is shown in **Figure 4.3**. Several issues specifically related to BES have been considered in this analysis (biodiversity, water, etc.), with varying levels of importance assigned to them.⁵⁸ Interestingly, the views of Holcim on the importance of these issues, particularly biodiversity and water, are very different from those of their stakeholders.

Figure 4.3: Materiality analysis by Holcim⁵⁹



Barriers to including BES in materiality analyses

The Economics of Ecosystems and Biodiversity (TEEB) identified limitations in the extent to which valuation approaches and accounting practices, as key barriers to ecosystem services issues, appear as material elements of financial accounts. Accurate measurement is crucial if companies are to manage and report on their impacts and dependencies. These are discussed in more detail within **Chapters 5** and **6** of this report.

Key messages

- A material issue is largely defined as one that has a significant financial impact on corporate activities.
- BES is rarely valued by the market and is largely overlooked in evaluation of material issues.
- Nonetheless, a number of companies have identified BES as a material issue with the potential for affecting corporate value and performance.



5. Biodiversity and ecosystem services in reporting

This section outlines the trends and drivers for BES disclosures in corporate sustainability and annual financial reporting. It includes a disclosure survey of 40 companies from four sectors considered as ‘high risk’ by certain investors’ studies and summarises the status of reporting on BES, highlights existing and emerging guidance, and provides leading examples of reporting and disclosure.

Why report on BES?

The emergence of business risks and opportunities associated with BES is creating a need to identify, measure, monitor and disclose indicators that enable companies to manage the issue. Internal and external reporting on BES is required to support operational decisions, inform financial valuations or capital expenditure decisions and to communicate with internal and external stakeholders. Undertaking such communications can have numerous benefits for organisations (including reputation, marketing, trust in brands, preparation for potential future requirements, market differentiation).

Companies that have a direct impact on BES (e.g. those in the extractive industries), or those companies directly dependent on them (such as food producers and the utility sector) are likely to experience shareholder or stakeholder pressure to disclose first. Those with indirect links through extended supply chains are likely to experience less pressure to do so, although this may change as knowledge increases about the indirect impacts of supply chains on BES.

Guidance and reporting requirements

As values of BES to business become more transparent and more readily linked to corporate performance, the scope for such issues to become incorporated within corporate disclosures (both narrative and performance reporting) will increase. A number of international formal reporting frameworks and guidance already specifically reference BES.

Mandatory reporting requirements

There are currently few laws requiring disclosure of BES issues, or of environmental and social issues. Even so,

a number of regulations that govern financial reporting and accounting make reference to the need to identify, consider and disclose material social and environmental issues. Examples include the 2006 reform of UK Company Law and the EU Modernisation Directive. The trends in BES loss and links to business risk described in **Chapter 2** clearly illustrate the need to encompass BES risks and disclosures within any response to these requirements. Furthermore, a number of these issues are already affecting the financial accounts, as illustrated in **Appendix 2**.

Some countries have been more explicit in their reporting requirements. The New Economic Regulations Law no. 2001-420⁶⁰ passed in 2001 in France, for example, requires quoted companies to disclose environmental performance including water, energy and other resource consumption, emissions, biodiversity impacts, waste management, and issues of non-compliance with pertinent laws. The Financial Statements Act in Denmark requires state-owned companies and companies with assets over €19 million, revenues of more than €38 million and more than 250 employees to report on their responsibility to society. Companies are encouraged to follow the guidance set out by the Global Reporting Initiative (GRI), which includes a number of biodiversity-related indicators.⁶¹

Voluntary reporting guidance

Governments, NGOs and industry bodies have developed a range of frameworks or guidance to assist companies in identifying and disclosing their environmental and social performance. Although these are not statutory requirements, they are increasingly being adopted by the private sector. Cross-sectoral guidance produced by the GRI is perhaps the most widely used guidance for corporate reporting, with nearly 3,900 companies now producing GRI-guided sustainability reports, while other examples and frameworks include the AA1000 Series of Standards⁶² from Accountability, and the International Federation of Accountants’ ISAE 3000.⁶³ Sector-specific guidance has been produced for the mining, oil and gas, food and drink, and cement industries, and includes BES-related indicators.

5. Biodiversity and ecosystem services in reporting

Current trends in BES reporting

Although a handful of companies in sectors with high environmental impact are reporting substantial detail on BES impacts, enhancement and risk management, the majority are reporting little or no information.⁶⁴ A study by PricewaterhouseCoopers in 2010 showed that only 18 of the largest 100 companies mentioned biodiversity or ecosystems in their annual report, only six had measures in place to reduce their impacts and only two identified them as a strategic issue.⁶⁵ This was backed up by the survey of ACCA members reported here, which showed that 62% of the respondents' organisations did not report on the issue.

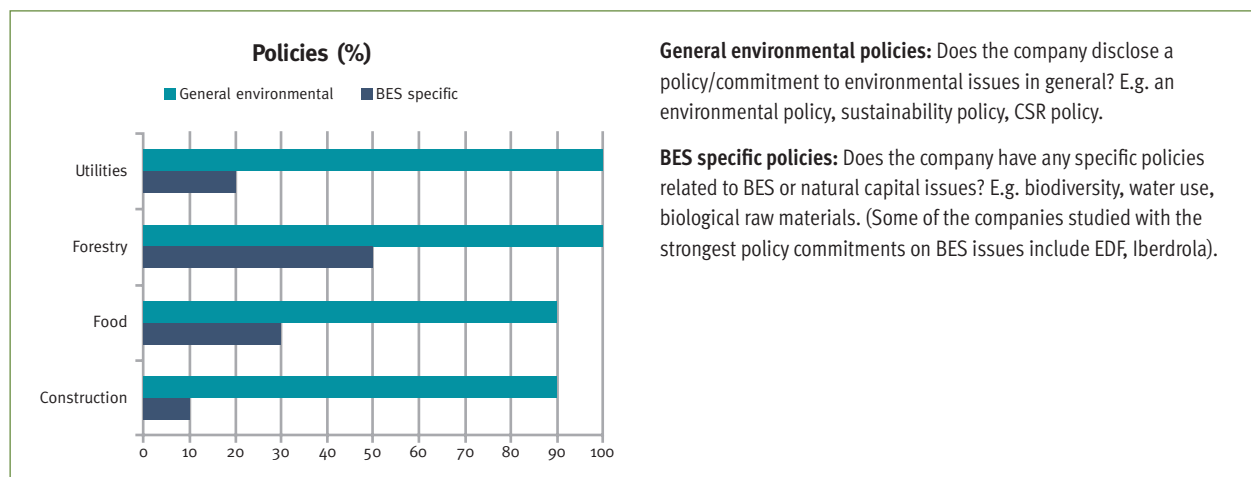
Disclosure survey

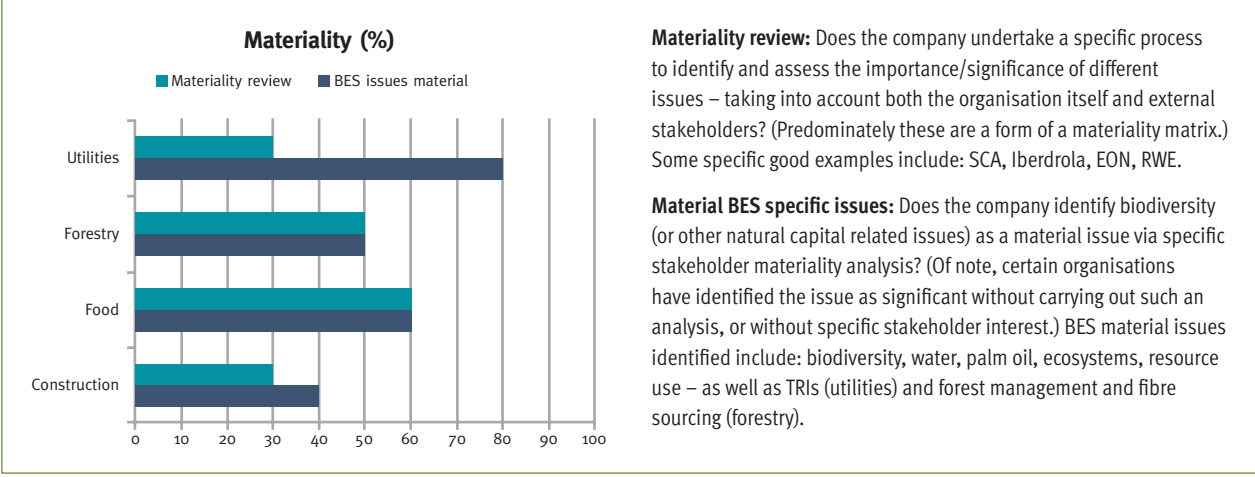
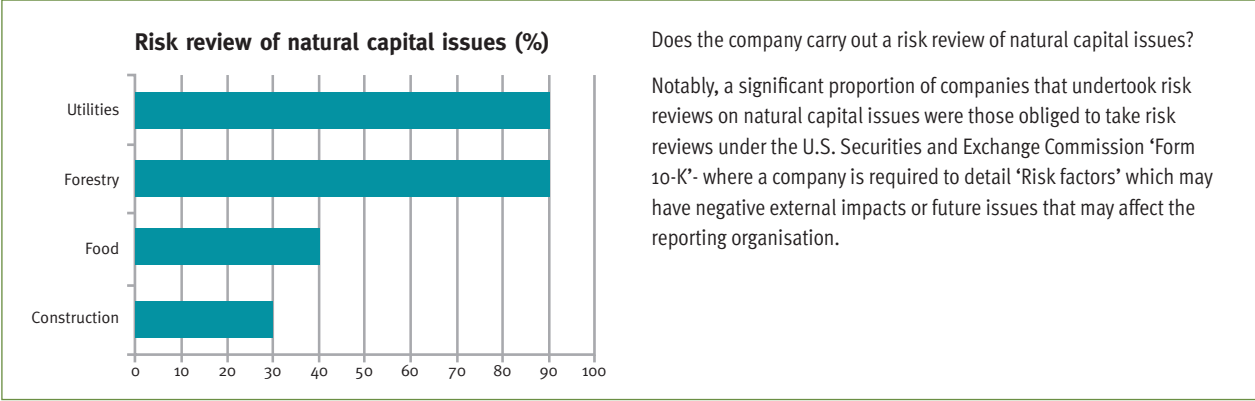
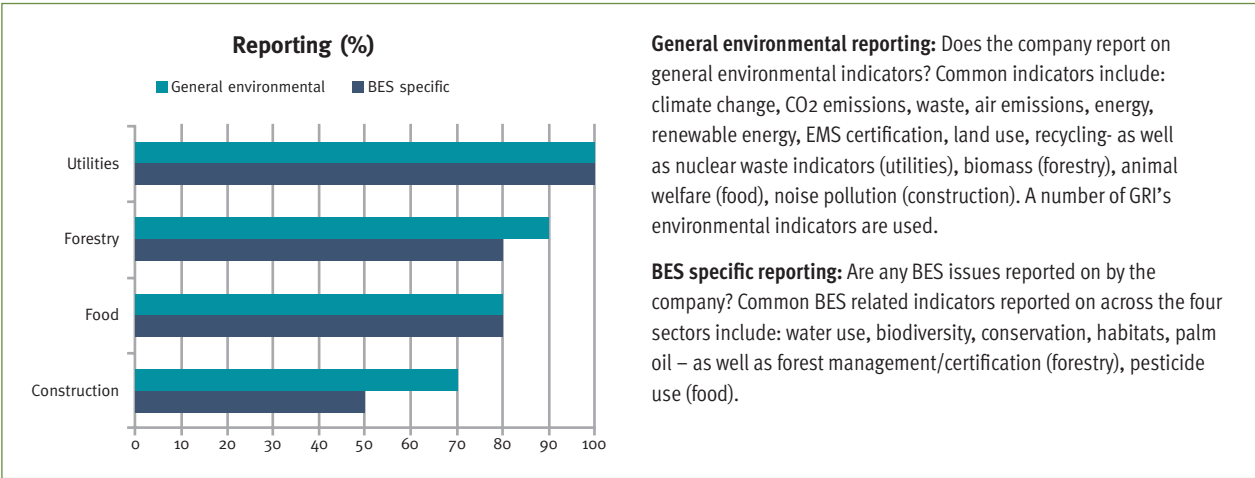
As a study of BES reporting in practice, a review of the top ten companies by market capitalisation in four sectors (Utilities, Forestry, Food, Construction) identified by the

investment community as 'high risk' (as identified through studies in **Table 3.2**, page 16) was undertaken.

While it showed that approximately three-quarters of the companies surveyed reported on BES issues within their corporate disclosure (annual reports or sustainability reports) the majority of this reporting was limited to water consumption or use. The extent of response of different sectors to the issue, and the level of detail of corporate reporting on the matter, varies despite similar risk profiles across these high-impact sectors. Furthermore, 17 companies undertook some form of materiality analysis, with just over half integrating BES/natural capital issues into their evaluation of materiality. The following graphs (with accompanying notes) illustrate this variation within, and between, these four sectors. The methodology employed to undertake this survey is detailed in **Appendix 3**.

Figure 5.1: Disclosure survey results





5. Biodiversity and ecosystem services in reporting

“Significant judgement is used to produce the numbers that go into the sustainability or corporate responsibility report. If we were to start to amend the numbers that have come through the regular accounting process without a consistent approach or broadly agreed guidance, credibility would be quickly lost.”

John Bason, Finance Director, ABF

Additional notes on disclosure survey

- Across all sectors studied, among those companies implementing an environmental management system (EMS), ISO14001 is generally used. Further information as to whether BES are referenced within EMSs was not available publicly.
- The levels, and extent, of assurance on reporting is variable, ranging from statements offering full assurance, to more limited assurance on specific performance indicators or issues.

Other studies of BES reporting

Studies undertaken by the Natural Value Initiative of the food, beverage, tobacco, pharmaceutical and extractive sectors showed that corporate reporting on biodiversity is largely qualitative in nature and indicators focus on management systems rather than measures of performance.⁶⁶ Furthermore, few companies were able to demonstrate a logical flow of information on BES that sets out a policy, a risk-evaluation process (including an evaluation of materiality), any tools in place to identify and manage site-level impacts, or any targets and performance monitoring or the reporting of sector-relevant indicators for BES. Disclosures on the linkages between BES and other key areas of environmental performance such as climate adaptation and mitigation and water management were even more limited. This makes it difficult for external stakeholders, and in particular investors, to understand the extent to which the company is managing natural capital risks.

Challenges to reporting

The *TEEB for Business* report highlighted the following barriers to comprehensive disclosures on BES.

- **Perceived immateriality:** many companies do not see BES as a material issue; for many sectors a clearly quantified business case for action, management, monitoring and disclosure on the issue is lacking.
- **Lack of understanding and awareness:** the potential links between business risk, opportunity and natural capital are poorly understood and, therefore, the need to manage and monitor them is overlooked.
- **Lack of disclosure guidelines and valuation methodologies:** although a number of attempts have been made to set out indicators on biodiversity, appropriate indicators on BES are still being developed. Furthermore, few of these indicators clearly link to business impact, risk and management activities in a way that enables better risk management and none as yet reflect financial values, with the exception of new asset classes such as carbon credits based on forest conservation. In many cases, the indicators are interpreted differently by different companies, leading to challenges in comparing company performance.⁶⁷
- **Perceived lack of demand:** from the users of the accounts, i.e. the investors.
- **The potential of judgement-based statements on BES to undermine the credibility of the accounts, annual report and/or sustainability reports:** the CFOs interviewed for this report identified the judgement-dependent nature of BES disclosure as an issue. Concern was expressed that the overall credibility of the annual report might be undermined by the potentially large error margins in calculating BES indicators.

A consistent message from the CFOs interviewed was a need to avoid overcomplicating the annual report by integrating natural capital issues. There was a general belief that the annual report should remain targeted at shareholders, with natural capital issues included only if 'material'. CFOs were supportive of including detailed information in sustainability reports, but highlighted the need for guidance to enable consistency, comparability and quality of data.

Box 10: Insights from the ACCA members' survey: natural capital and reporting

Those 59 ACCA members whose companies were undertaking reporting on natural capital cited statutory requirements as one of the key drivers for reporting on the issue (59%), followed by risk management (55%) and stakeholder management (50%). Other drivers for reporting included industry requirements, e.g. the Cement Sustainability Initiative⁶⁸ on biodiversity indicators, emerging common practice and cost management.

- Members reporting on natural capital highlighted that information on the topic is included in a range of sources, with the most significant being the company annual report, sustainability report and website.
- Key challenges identified by those members reporting on natural capital issues are a lack of disclosure guidance and valuation methodologies. Similarly, members who do not currently report on the issue also emphasised both these factors as barriers to undertaking reporting on natural capital. In addition to citing low understanding, they mentioned a lack of stakeholder pressure and perceived low materiality of the issue.
- The lack of a clear, enforced regulatory requirement was cited by a number of members as a key barrier to reporting.

Government-led initiatives to promote the consideration of natural capital

Businesses need to be aware that certain governments are taking action to promote the consideration of natural capital. For example, the Dutch⁶⁹ and Belgian⁷⁰ governments have set the target that all palm oil used and consumed in the respective countries is taken from sustainable sources by 2015. Such initiatives will affect businesses operating in these countries, and will probably require greater disclosures in the arena of natural capital such as the use of sustainable palm oil.

Key messages

- Corporate reporting of BES issues occurs both within the annual report and accounts and sustainability report.
- Some companies report on the issue in detail but this can vary even within sectors.
- Companies reporting on natural capital risk tend to be those required to do so by law.
- Lack of agreed metrics and reporting guidance combined with a perceived immateriality hampers more comprehensive reporting; this represents a failure to meet the needs of stakeholders.



6. Valuing biodiversity and ecosystem services – trends and current practice

This section of the report considers how BES is currently valued within annual reports and accounts and sustainability reporting, and the development of emerging ES valuation methodologies.

Valuing ecosystem services and corporate decision making

Fifty per cent of company earnings could be at risk from environmental externalities; this is equivalent to 11% of global GDP.⁷¹ Emerging statistics such as these are encouraging governments to explore incentives to persuade investors and companies to manage and minimise such externalities (which include ES). In addition, tough commitments made at the international level at the COP 10 Nagoya (2010) have made the protection of biodiversity a key commitment for some countries. With increasing regulation and civil society interest in this issue, effective valuation of BES will become increasingly important for providing an accurate picture of corporate performance for decision making and performance.⁷²

Companies that value their impacts and dependencies on BES will be able to make more accurate assessments of the value of assets and liabilities, and to spread costs and realise preferential cash flows or to contribute to the development of appropriate tax regimes (see **Figure 6.1** and **Box 11**).

Current approaches to valuing natural capital

Most elements making up natural capital (namely BES) are not traded, making it difficult to determine their value through markets. Certain techniques can, nonetheless, be applied to estimate their value, although these are not widely used by the accountancy profession. Hence, BES issues do not routinely feature within the financial figures.

Most ways of valuing aspects of BES that are not traded in markets rely on forms of economic analysis. These analyses are concerned with a small change in a specific

Box 11: *The Economics of Ecosystems and Biodiversity (TEEB) for Dutch businesses*

The Dutch Government commissioned KPMG to undertake an evaluation of nine industry sectors in the Netherlands, investigating the potential costs and benefits of business alternatives with a reduced impact on BES (e.g. bio-plastics, certified soy, bio-pharmaceuticals, and natural pollination). Applying valuation techniques, the study showed that companies responding proactively on this issue experienced increased competitiveness and reduced risks. In six out of the nine sectors studied, strategic opportunities were identified that were associated with managing natural capital. Examples include the development of second-generation bio-plastics to reduce oil dependency and the production of alternative vegetable-based fish feed to anticipate fish scarcity.

element of ES, for example the change in wetland ES as a result of the establishment of a tidal barrage. It is important to understand the ES changes as a whole; for example, in the case of the tidal barrage a decrease in fish and a change in landscape may occur at the same time as the production of carbon-free energy and the development of tourism (as in the case of the Thames barrier). Thus, the changes in ES help to give a holistic view of the implications associated with a specific course of action, which can feed into the decision-making process of the companies involved. One of the most commonly used models for understanding all components of social well-being, and hence all constituents of value, of BES is the Total Economic Value (TEV) framework^{vi} (see **Figure 6.2**).

The TEV framework details all aspects of value that can be considered in terms of both **use** (i.e. the parts of ES used for production, etc.), and **non-use** (i.e. the parts of ES that have a value simply because they exist).

^{vi} The Total Economic Value (TEV) framework is used to measure how much a change in natural capital such as loss of wetland is worth given the associated change of wellbeing that occurs across society as a whole. ⁷³

Figure 6.1: Benefits of using valuation techniques on ecosystem services ⁷⁴

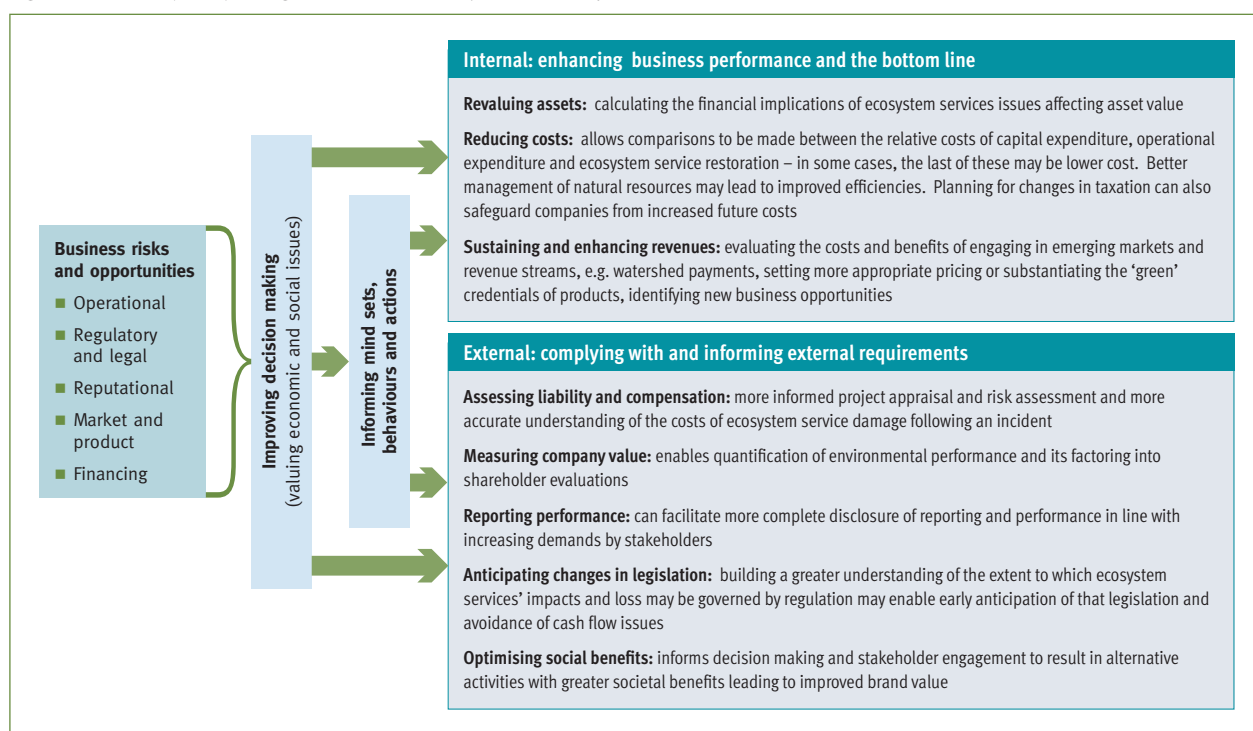
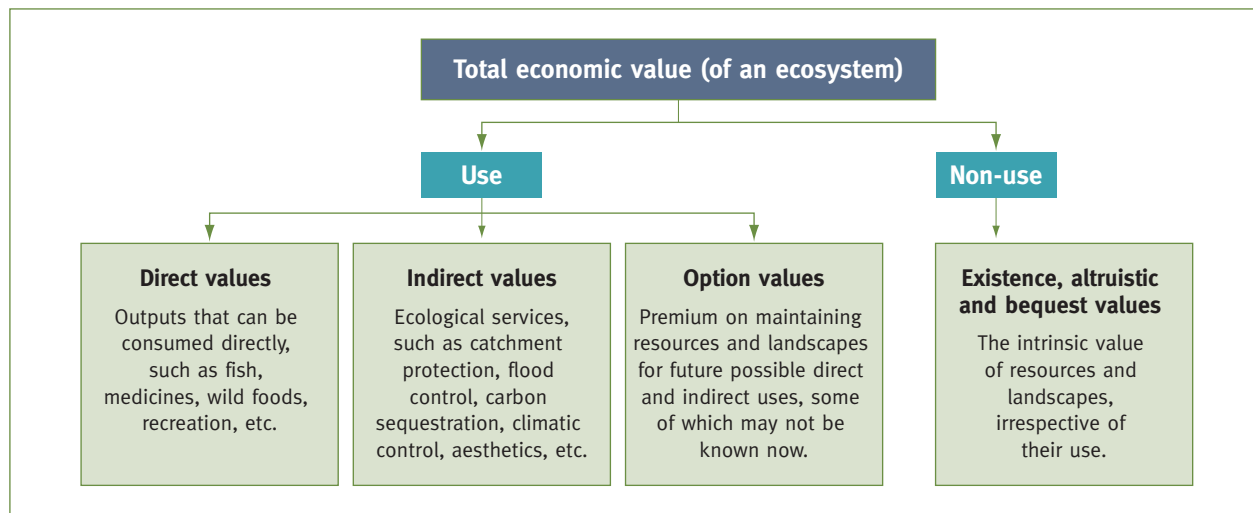


Figure 6.2: The total economic value framework ⁷⁵



“All too often, the benefits of ecosystem use flow to one party whilst the costs flow to another.”

Mark Rose, CEO, Fauna & Flora International

For each of these elements of economic value, a number of different valuation methodologies exist to allow the monetisation of non-traded goods. These can be split into several categories, including revealed preference, cost based approaches, stated preference and value transfer.

- **Revealed preference:** techniques are based on the observation of individual choices in existing markets that are related to the ES that is subject of valuation.⁷⁶ An example of this approach includes understanding the change in value of house prices associated with the proximity of a house to areas of natural beauty or the change in car purchase price for cars with increased fuel efficiency. This approach can be used to estimate the direct, indirect and option value elements of the TEV (see **Figure 6.2**).
- **Cost based approaches:** include techniques that look at the cost of replacing an ecosystem service that is currently providing a function for free or the damage costs avoided, e.g., where a wetland protecting an area from flooding is replaced by the building of a flood defense. An alternative use of cost based approaches can be in aiding companies to work out the costs of BES management for a specific set of outcomes as part of their daily business. Cost based approaches can be used to estimate the direct and indirect value elements of the TEV.
- **Stated preference:** approaches that simulate a market and demand for ES by means of surveys that estimate willingness-to-pay for hypothetical changes in the provision of ES. Examples of this approach are seen in the water industry where water companies ask customers how much they are willing to pay as part of their water bill to avoid flooding, or to shorten any supply outages that may occur. Other examples explore respondent's willingness to pay to preserve natural areas through increases in tax, or through the introduction of access fees. They can be used to estimate both use and non-use values of ecosystems and/or when no surrogate market exists from which the value of ecosystems can be deduced.⁷⁷ This approach can be used to estimate all elements of the TEV.

Box 12: Case study: the use of valuation within the UK water industry

Many of the main water companies in the UK use stated preference techniques to understand customer preferences. Most recently, UK Water Industry Research (UKWIR)⁷⁹ released water industry guidance on the use of stated-preference surveys within the industry to help water companies 'elicit customers' preferences on aspects of service and environmental quality' as part of a decision-support tool for investment planning.

- **Value transfer:** approaches that take the economic values estimated in one context and apply these with or without adjustments within another context.⁷⁸ An example of this is where a study has been carried out to estimate the value of a local woodland of a specific size in one area of a country, the results of which are then used to value a similar piece of woodland in another part of the country with adjustments for woodland size, and differences in population characteristics such as income. This approach can be used to estimate all elements of the TEV.

BES valuation in business-risk evaluation and materiality decisions

A number of companies are exploring the use of valuation techniques to assist in decision making. While the application of such techniques is not widespread, leading firms are considering them so as to incorporate non-market factors into their decisions. There follows two examples of how this is done in practice.

“ In 2011, both financial and non-financial sustainability information has been integrated in Eni’s Annual Report at several levels. We are currently working to further incorporate the correlation between Biodiversity and Ecosystem Services risks and opportunities into our financial reporting. ”

Antonio Pinto, Vice President - Planning and Control, Eni

Box 13: Case study: Exploring ecosystem valuation to move towards net positive impact on biodiversity in the mining sector⁸⁰

The mining company, Rio Tinto, has a policy goal of net positive impact on biodiversity in its operations. As part of its offset strategy in Madagascar, the company is supporting the conservation of areas of lowland forest to compensate for the impacts of its mining operations in the country.

Rio Tinto has worked with the IUCN (International Union for Conservation of Nature) to assess the monetary value of this project. The study has shown significant net economic benefits associated with conservation (\$173m). It also showed that many of the benefits accrue globally (e.g. carbon storage, wildlife habitat), while many of the costs are born predominantly by local communities (e.g. reduction in access to forest resources).

In doing so, the project highlighted the need for Payments for Ecosystem Services (PES) schemes to address the imbalance between those receiving the benefit of such schemes and those bearing the cost. It also demonstrated how a private company can use economic valuation to manage its environmental footprint.

Box 14: Case study: Oil exploration in an area of high biodiversity value

The Italian oil and gas company Eni operates the Villano oil field in the Ecuadorian Amazon. A significant challenge of the project is related to its location in an area of extremely high biodiversity value.

In order to minimise the company’s impacts on the forest, the plant has been constructed as if it were an offshore platform. Oil is transported via an ‘invisible pipeline’ that is hidden from view under the forest. Drilling platforms are only accessed by helicopter, avoiding much of the deforestation that would be caused by construction of access roads. Overall, an estimated 15,000 trees were saved from being cut down through the project’s environmental management plan.

These two case studies demonstrate that some companies are looking to quantify the non-market value of their impacts and dependencies on natural capital and bring them into corporate decisions however, such quantification is not always necessary to change corporate behaviour. Some companies may decide that the areas where they operate are of such significant importance from a natural capital perspective that they deserve particular care. Eni’s Villano Biodiversity project presents one such example (Box 14).

Valuing BES in the financial accounts

A number of existing financial reporting and disclosure standards can be applied to areas of business that affect or are dependent on natural capital. Examples of the areas that these standards address are property, plant and equipment (IAS 16), provisions (IAS 37) and the impairment of assets (IAS 36).

Although there are areas of financial reporting that can be applied to natural capital, this report has shown that traditional financial materiality assessments rarely consider it directly. As a result, natural capital is not often included within the financial accounts of a company. This may change in the future, as declining trends in natural capital could result in significant financial impacts on companies, thus qualifying them as material. Alternatively, greater clarity on how to value natural capital or developments to company materiality assessments may result in greater disclosure within financial accounts.

Further details of the standards that apply to natural capital and how they might be presented within financial statements are provided in **Appendix 2**.

“ The current financial reporting model only tells half the story about a business’s true performance and potential. The numbers say little of its reliance and impact on natural capital, factors that will increasingly influence competitiveness in a resource-scarce world. ”

Jean-Marc Huët, CFO, Unilever

Valuing BES and sustainability reporting

There are a few early movers that are looking to gain better understanding of the financial value of their impacts on BES, but the practice is a long way from being standard. In the review of 40 companies across the utilities, construction, forestry and food sectors carried out for this report, only one company was identified as using valuation techniques to quantify the value of the ecosystem services associated with its operations, and this was experimental in nature. This may change in the future, as leading companies demonstrate the benefits of taking such an approach.

Box 15: Case study: Taking a first step to quantifying and disclosing natural capital impacts

During 2011, the German sports brand, Puma, calculated that the environmental impacts of its operation amounted to €94.4 million in 2010. The company valued greenhouse gas (GHG) emissions and water use within its first statement. The exercise showed that 92% of Puma’s environmental impacts are located in its supply chain and that 36% of GHG emissions and 52% of water consumption are associated with the production of raw materials such as leather and cotton. Although this exercise relies on valuation techniques, the results are not included within the financial accounts of the company and, therefore, have limited impact on shareholder returns.

Beyond the marketing benefits of such an initiative, the programme provides Puma with much greater visibility of its operations and creates a business case for focusing on supply-chain issues. The company is working with suppliers to reduce negative externalities and to reduce costs and risks within its supply chain. The benefits of the exercise have been significant enough for its parent company, PPR, to implement the environmental profit and loss across its brands (which include Gucci, Yves Saint Laurent and Alexander McQueen) by 2015.⁸¹

Barriers to uptake of a valuation approach

There are a number of fundamental barriers to the increased uptake of valuation including accountancy practices, perceptions of compromised competitive advantage and fiduciary duty.

- **Accountancy practices:** often the bulk of the company’s impact or dependence on BES will lie beyond the boundaries of the company (as defined by accountancy practice), in the supply chain or through indirect impacts on BES outside site boundaries. If a strict approach to defining corporate reporting boundaries through management control and significant influence is followed, key risks and issues might be overlooked. Furthermore, for an asset or liability to be recognised by a company, the asset must be valued and any future costs or benefits linked to it must clearly flow to or from the company. This creates challenges: it is hard to apportion the benefits flowing from nature to individual companies, and elements of BES, such as parts of the ocean, have no ownership rights ascribed to them.
- **Perceptions of compromised competitive advantage:** for example, where valuation evidence leads a company to stop operating in a particular region or to change particular suppliers, owing to associated BES impacts, competitive advantage in terms of low-cost solutions may be put at risk.
- **Fiduciary duty:** in some countries fiduciary duty to shareholders may prevent corporates from valuing BES impacts. This is especially true if BES considerations substantially affect the cost profile of the organisation without promise of a reasonable return on investment in the short to medium term.

Further barriers include the perceived cost and time implications of undertaking valuations, a lack of skilled staff to undertake assessments and the experimental nature of the tools available for undertaking valuations, few of which are tailored to the private sector.⁸²

“ The best way to protect the natural environment is still under review. Harnessing market mechanisms through monetisation and winning the hearts and minds of businesses and consumers are both likely to have a role, in addition to better use of more traditional mechanisms such as taxation, regulation and planning. ”

Russ Houlden, CFO, United Utilities

Looking to the future

A number of trends are increasing the likelihood of the inclusion of the issue within financial accounts.

- **Growth of valuation of BES:** there is a broad acknowledgement that some BES cannot be preserved through market mechanisms alone. Nonetheless, governments around the world are introducing new compensation regimes and market-based instruments to help address threats to BES in line with a move towards a green economy. The UK government, for example, has stated its intent to use market mechanisms to promote the conservation of biodiversity and is creating funds to support experimentation with payment for BES-offsetting schemes.⁸³
- **Emerging integrated and mandatory sustainability reporting models:** the broader drivers influencing sustainability reporting and integrated reporting will have an associated impact on the extent of BES reporting, including IIRC.⁸⁴
- **Developments in national-level ecosystem and natural capital/resource accounting:** moves towards national-level natural capital/resource accounting⁸⁵ may help increase the robustness of performance indicators on the issue. Advances in this field will provide lessons that can be applied to the private sector. The World Bank is leading a project called WAVES (Wealth Accounting and Valuation of Ecosystem Services), which is intended to help countries rich in natural capital balance trade-offs among industry, communities and BES. The work aims to enable the maximisation of economic growth while identifying the beneficiaries and those who bear the costs of BES changes. It will develop an internationally agreed methodology for national ecosystem accounting.⁸⁶

Box 16: ACCA’s members anticipate that natural capital issues will become increasingly important in the next five years

ACCA members were asked to rate various natural capital issues in accordance with their perceived importance, both currently and five years in the future. The top issues include access to clean air, climate regulation, freshwater, biodiversity loss, loss of market share and consumer concerns linked to natural capital, regulation of water timing and flow, ecosystem service loss, loss of natural defences against natural hazards, avoidance of soil erosions and raw materials, e.g. timber.

Respondents claimed that all the above issues would increase in importance over the next five years, with the exception of freshwater, which is expected to decrease slightly.

Key messages

- BES issues can currently affect elements of the annual report and financial accounts.
- Even so, the lack of ability to value BES means that economic values are rarely represented in the accounts.
- Emerging valuation methodologies, and a drive to internalise environmental externalities by governments, may encourage the uptake and application of BES valuation models for disclosure purposes.



7. Conclusions and recommendations

This section sets out the report's conclusions and a series of recommendations for CFOs and accountancy and audit professionals.

Key findings

Perceptions of BES as a risk are variable within

the accountancy profession: not all companies that stakeholders consider high risk in terms of their impacts or dependence on BES evaluate that risk. Nonetheless, some among the accountancy profession routinely include such issues within business risk evaluations (see **Box 3**, page 8). Furthermore, a small but significant proportion of companies such as Iberdrola and EON include BES in their materiality reviews. The focus on financial measurement to determine materiality still acts as a barrier to the identification of BES issues as material.

Corporate BES disclosures, as currently made, are too limited to provide insights into risk management:

a handful of companies in sectors with high environmental impact are reporting substantial detail on BES, but the majority are reporting little or no information owing to a perceived immateriality of the issue. Nonetheless, this is at odds with stakeholder expectations, including those of some of the investment community, who are looking to companies to disclose on the matter.

Existing financial reporting and disclosure standards can be applied to the issue of BES:

in some cases, an item or issue relating to BES is measurable in financial terms and, therefore, included in the quantitative elements of the accounts. The interpretation and application of International Financial Reporting Standards (IFRS), such as those on business combinations, and International Accounting Standards (IAS), such as those on impaired, agricultural or intangible assets, could be influenced by natural capital loss in some sectors. In practice, many significant risks and opportunities are unquantified and/or cannot be easily valued, and are, therefore, excluded from the accounts.

Companies in a range of sectors are exploring the use of valuation techniques to assist in decision-making alongside other means of identifying and evaluating risk:

some, such as Rio Tinto and Eni, are testing the use of environmental economic valuation in informing business decisions; others are using stakeholder dialogue or enhanced environmental impact assessment processes that include consideration of BES.

There are a number of barriers to corporate action: these impede companies from effectively determining risk and opportunity exposure on BES. They include the lack of a standardised business case, low and unavailable market values for BES, and certain accounting principles. The accountancy and business communities also lack awareness of natural capital issues.

Understanding of the concepts and terminology:

although there is broad understanding of terms such as 'biodiversity' and 'ecosystems', the terms 'ecosystem services' and 'natural capital' are less well known, reflecting the relatively recent emergence of these issues as business risks.

Recommendations

This report is targeted at two key audiences: firstly, CFOs, and secondly, accountants (both in practice and industry). The following recommendations are tailored for these two key audiences but are focused, nonetheless, on the common key themes that form the overarching issues discussed in the report. Furthermore, given their strategic capacity, CFOs should use their position and expertise to guide, influence and instruct the accountants within their organisations in their practitioner role; these, in turn, should support and provide feedback and relevant information to their board-level management.

Key themes

- Engage with experts and develop skills: follow guidance being produced by expert groups on how to address BES.
- Identify externalities to internalise impacts on BES.
- Define materiality to ensure that all risks and opportunities posed by BES are picked up.
- Consider the use of valuation methods if and when appropriate.
- Enhance disclosures on natural capital.

For CFOs

CFOs have been targeted owing to their role in driving company strategy and vision. Operating at the board level, CFOs are in a key position to bring the recommendations of this report onto the corporate agenda. They are also important stakeholders for regulators and standard setters and, therefore, are well placed to influence such bodies.

CFOs should:

- engage with experts to understand the level to which their organisations depend on natural capital; this would include understanding the degree to which company revenues, costs and going concern status rely on natural capital (both directly and indirectly)
- ensure that risk and materiality assessments consider natural capital; by doing so, CFOs will be able to determine if the various risks posed by declining natural capital will have a material impact on their organisations and to implement mitigation strategies to avoid negative impacts on corporate value
- work with finance teams to develop the skills and capacity to enable accurate assessment of a company's impact or dependence on natural capital
- disclose material natural capital impacts and dependencies, guiding the development of robust disclosure and assurance systems to ensure data quality
- use their board position to educate other board members on the importance of BES within key management and strategic decisions
- consider whether natural capital can be incorporated into financial accounts, and engage with the IASB or local accounting standard setters on how current accounting standards can be improved to address the topic better
- engage with organisations, such as IIRC or NCD, that are looking to develop tools to account for natural capital

- learn from those already engaged with these issues, and consider how the tools that are used by these companies can be applied to their own operations.

For accountants

Accountants have been targeted owing to their role, within both industry and practice, in reporting and assuring corporate performance. As a result, the core skills and expertise of accountants will be integral to the creation of new methods of valuing and manage natural capital.

Accountants should:

- draw on their core skills and expertise in the accountancy profession to contribute to the development of potential natural capital accounting methodologies. This can aid the quantification and management of company externalities, in particular
- call on accountancy bodies to provide guidance on how to address natural capital within company annual reports and accounts, as well as sustainability reports
- follow and track new guidance that becomes available within the area of natural capital
- engage with experts to increase skills through workshops and training
- pilot or trial natural capital accounting methodologies with clients, where appropriate, and use this experience to work with regulators on disclosure guidance and assurance practices.

Why now?

The challenge for the accountancy profession will be to determine when the loss of natural capital will require an enhanced understanding and approach to business-risk assessment and corporate disclosure. To do so too late may lead to failures to anticipate future risks and their associated costs to business. It may also lead to overlooked opportunities to increase supply chain resilience, secure and maintain a licence to operate, and enter new markets.



Appendix 1: Interviews

A total of eight interviews were conducted with CFOs and senior managers from companies that operate within sectors that have a high impacts or dependencies on natural capital, or are leaders in terms of their approach to managing their impacts or dependencies.

The interviewees are listed below.

- **John Bason**, Finance Director, Associated British Food
- **Antonio Pinto**, Vice President – Planning and Control, Eni
- **Vanessa Harvard-Williams**, Partner and Global Head of Environment, Linklaters
- **Andrew King**, CFO, Mondi
- **James Singh**, Executive Vice President & Chief Financial Officer (recently retired), Nestlé
- **Chris Brett**, Senior Vice President, Head of Corporate Responsibility and Sustainability, Olam
- **Thomas Lingard**, Global Advocacy Director, Unilever
- **Roger Seabrook**, Vice-President of Investor Relations, Unilever
- **Russ Houlden**, CFO, United Utilities and Member of the UK Environmental Markets Task Force

The questions that were put to interviewees are shown below.

Risk management

1. Please outline your process for identifying financial and non-financial risks or opportunities for your business.

Materiality

2. Please describe your process for identifying financial and non-financial risks or opportunities for your business and filtering them for disclosure purposes.

Natural capital

3. How does natural capital play into the processes above, if at all? Who is involved in the decision-making process and what issues, if any, have been identified as significant/material?
4. Have you seen specific natural capital issues affect the business? Have you come across a specific example that you would like to highlight, e.g. issues that may have affected the share price or licence to operate?
5. To what extent, if at all, have you been involved in discussions/ evaluations of the value of natural capital to your business? What barriers do you see to valuing natural capital within measures of corporate performance?
6. What do you find 'wrong' or 'weak' or 'frustrating' with the current model of financial reporting? Do you think the current model lends itself to reporting on natural capital adequately? If not, why not, and how would you rectify this?
7. Are there any initiatives/ projects related to natural capital in which your company has been involved that you would particularly like to highlight?



Appendix 2: Financial statements and Financial reporting standards

In order to demonstrate how natural capital may affect or be included within financial accounts, the following set of financial statements has been prepared and annotated.

Some companies will have direct impacts or dependencies on natural capital (such as forestry companies), while others (such as retailers) will have indirect impacts or dependencies on natural capital. The annotations included in the diagram below can be applied to either case.

Please note, the figures included below are for illustrative purposes, and do not relate to any real organisation.

Table A2.1: Profit and loss

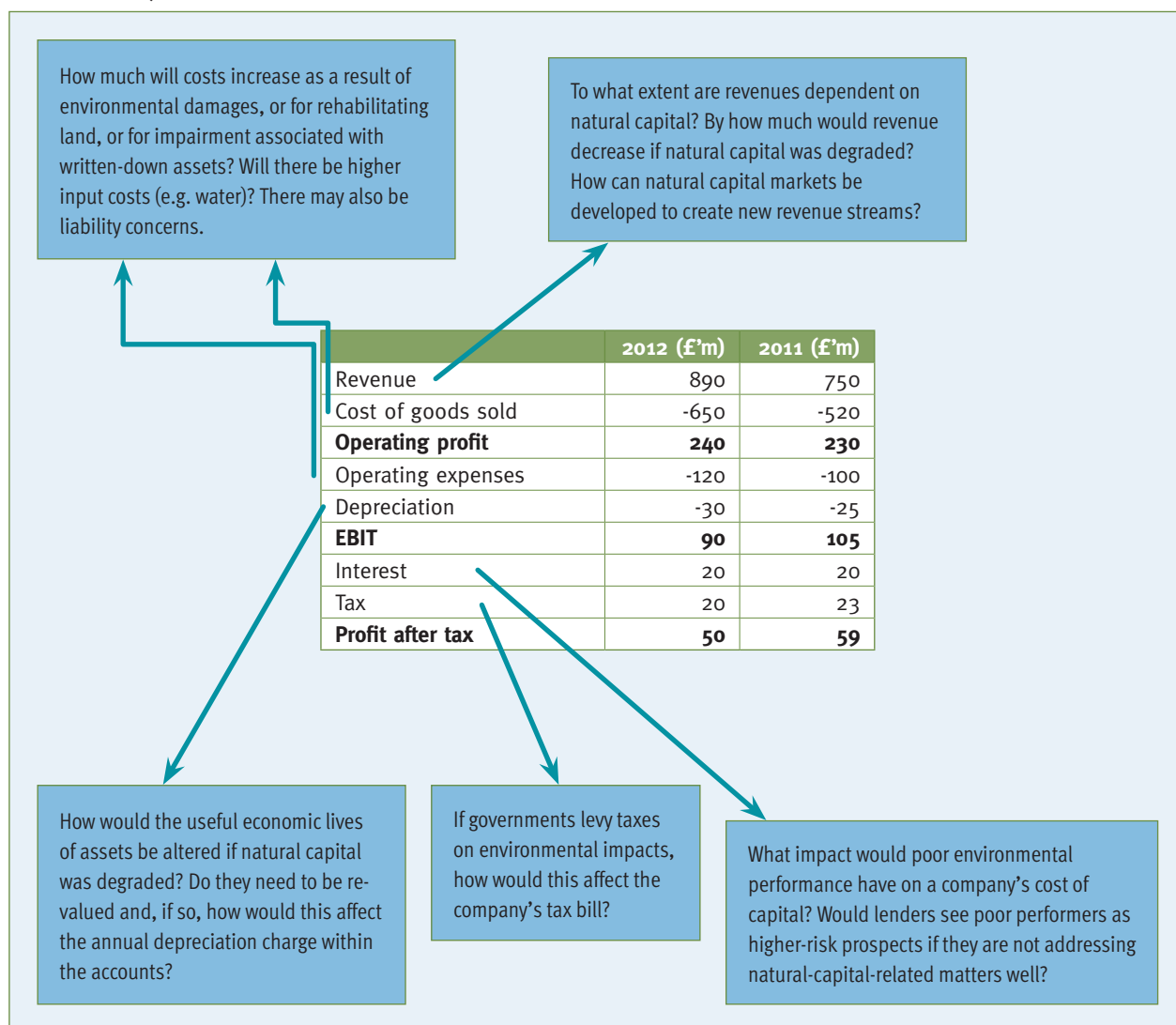


Table A2.2: Balance sheet

How would goodwill be affected by the manner in which a company addresses natural capital? Could better management increase a company's goodwill or could poor management lead to goodwill impairment?

Would new market mechanisms, such as biodiversity markets, create credits that would qualify as intangible assets?

Could trends in natural capital reduce the value in use or recoverable value of PPE, resulting in the need for impairment?

How would tighter rules on rehabilitating industrial sites affect restoration provision? Would tighter environmental regulation lead to the increasing of environmental provisions?

	2012 (£'m)	2011 (£'m)
Goodwill	20	25
Intangible assets	40	43
Property, plant and equipment	730	800
Non-current assets	790	868
Inventories	12	15
Trade and other receivables	35	45
Cash and cash equivalents	4	5
Current assets	51	65
Total assets	841	933
Borrowings	-80	-100
Trade and other payables	-23	-26
Current liabilities	-103	-126
Borrowings	-150	-170
Provisions	-350	-340
Non-current liabilities	-500	-510
Total liabilities	-603	-636
Net assets	238	297
Share capital	14	14
Share premium	139	139
Reserves	35	85
Retained earnings	50	59
Total equity	238	297

The above financial statements show where natural capital could be included within a company's accounts. To provide further information on this topic, a number of financial reporting and accounting standards have been reviewed to see how they relate to natural capital.

Table A2.3

Standard	Objective	Link to natural capital
IAS 37: Provisions, Contingent liabilities and Contingent assets	Prescribes the accounting treatment of all provisions, contingent liabilities and contingent assets. It is not necessary to have a legal or contractual obligation ⁸⁷ for a liability to be present, a constructive obligation is sufficient. Hence, a much broader group of stakeholders can make a claim against the entity.	<p>IAS 37 relates to natural capital for two key reasons.</p> <p>First, a company may be legally required to restore a site where it operates once it has finished using the land. This will involve rehabilitating the site such that the biodiversity and ecosystem services associated with it are restored to their original state. An estimate of the cost of restoration must be made at the start of a project and recognised within the financial statements of the company as a provision.</p> <p>Secondly, the legal environment facing companies is getting more complex. With laws being established granting nature equal rights to humans in countries such as Bolivia, companies may face litigation owing to poor environmental performance. As a result, they would need to make provisions for potential fines or damages.</p>
IAS 16: Property, Plant and Equipment	Sets out the accounting treatment for property, plant and equipment (PPE). The main issues addressed are the recognition of assets, the determination of their carrying amount and impairment losses to be recognised in relation to PPE.	<p>As noted above, large capital projects often require companies to restore and rehabilitate the sites upon which they are situated. For example, a coal mine may be required to rehabilitate and restore a mine site once the mine has been closed.</p> <p>Restoration costs must be estimated at the start of the useful economic life of the capital asset, and recognised on a company's balance sheet within the costs capitalised.</p>
IAS 36: Impairment of assets	Developed to ensure that an entity's assets are carried on its balance sheets at the correct value.	<p>Trends in natural capital may affect the value of the assets that a company holds on its balance sheet.</p> <p>IAS 36 states that an asset should be held at the lower of its value in use (i.e. the future economic benefits associated with the asset) or its recoverable amount (i.e. the value it could be sold for).</p> <p>If the costs of running an asset increase owing to trends in natural capital (e.g. increased water scarcity leads to higher water prices), this will reduce the asset's value in use and/or its recoverable amount, leading to impairment.</p>

Standard	Objective	Link to natural capital
<p>IAS 41: Agriculture</p>	<p>Prescribes the accounting treatment and disclosures related to agricultural activities.</p>	<p>As per IAS 36, trends in natural capital may affect the value of agricultural assets held on a company’s balance sheet. This is best demonstrated through the following example.</p> <p>The value of an orchard may fall significantly owing to the reduced capacity of pollinating insects. In recent years, bee populations have suffered for a number of reasons, which has a detrimental impact on fruit growers as bees play an essential part in fruit production, as pollinators. The presence or absence of pollinators can affect crop yields by as much as 90% for some crops⁸⁸. As a result, failing bee populations will result in less productive fruit trees – which reduces their value.</p>
<p>IAS 38: Intangible assets</p>	<p>Prescribes the accounting treatment for intangible assets.</p>	<p>The global annual size of biodiversity markets, e.g. biodiversity offsets, is between \$1.8 and \$2.9 billion.⁸⁹</p> <p>Mitigation banking for impacts on wetlands in the US operates through the restoration of a ‘bank site’. This site is a wetland, stream or other aquatic resource that has been restored under the scheme. Each site carries a certain amount of credits that can be purchased by a firm that has caused damage to other wetlands elsewhere.</p>
<p>IFRS 3: Business combinations</p>	<p>Prescribes the accounting treatment for transactions where one company obtains control over another.</p>	<p>The difference between the purchase price of a business and the aggregate fair value of the assets that are being purchased is known as goodwill. This value relates to things such as a company’s brand(s) and expected future performance.</p> <p>Considering that there is strong consumer demand for sustainable products, companies that are doing a lot to address natural capital are likely to have positive growth prospects.</p> <p>Also, companies that can demonstrate ability to manage the risks associated with natural capital are likely to be valued more highly than those that cannot.</p> <p>Both these factors would result in higher valuations and consequently higher levels of goodwill.</p>
<p>IASB guidance on narrative reporting</p>	<p>This is non-mandatory guidance on the preparation and presentation of the management commentary that accompanies company financial statements.</p>	<p>Although the guidance does not specifically reference natural capital, it does encourage companies to disclose their principal risk exposures, and plans to mitigate those risks.</p> <p>As a result, companies that are highly exposed to risks associated with natural capital are encouraged to disclose this, along with their plans to manage the risks.</p>



Appendix 3: Disclosure survey of high-risk sectors

The methodology employed in undertaking the disclosure survey is as follows.

- Selection of four ‘high risk’ sectors (in relation to BES issues) from the analysis carried out in **Table 3.2**: ‘Sectorial risk, biodiversity and ecosystem services’ – namely: *forestry; agriculture and food; construction; utilities*.
- Identification of 10 of the largest global companies, according to market capitalisation (filtered from the sources *S&P 500 Companies and Forbes Global 2000 Leading Companies*^{vii});, in each sector: See **Table A3.1** below for listing of these companies.
- Development of a structured survey containing around 30 questions based on governance, policy, management systems, reporting, assurance, risk, materiality, stakeholder engagement and guidance in relation to wider ES, and more specific BES/natural capital, issues.
- Undertaking of survey for the 40 companies, focusing on their public disclosure in their most recent corporate reporting (annual report, sustainability report, integrated report, Global Reporting Initiative report), and information on their corporate websites.
- Collation of survey results to identify the varying levels of disclosure and reporting on specific issues determined as relevant to report.

Notes and limitations

Although the disclosure survey aims to provide a perspective on the specific disclosure of the companies it targets, the scope of the investigation was limited to a relatively broad-brush review of each organisation’s disclosure on the issues considered (rather than a detailed or forensic analysis of their reporting efforts). Owing to constraints on time, and to ensure it remained within the scope of the project in relation to other components of the report, certain time/research boundaries were imposed on each review (between two and three hours’ investigation, and only considering research material directly available from each corporation’s website, rather than taking into account external sources or assessments). As such, the exercise and results should be interpreted not as a benchmarking or ranking of the companies reviewed, but as a more general, and overarching, evaluation of reporting and disclosure activity from each organisation’s own perspective.

Additionally, many companies build up a picture of how they manage an issue over time, with website disclosures and disclosures in old reports that are not repeated; hence the present analysis may be incomplete. Furthermore, GRI reports may be incomplete or inaccurately completed (there is a lot of interpretation by companies of what indicators actually mean).

Table A3.1: 40 companies across four high-risk sectors reviewed in survey

Forestry	Agriculture and food	Construction	Utilities
Weyerhaeuser	BRF Brazil	Vinci	GDF Suez
UPM	Archer Daniels	Larsen & Toubro	E.ON
International Paper	Tyson	China Communications Construction	EDF
Mondi	Viterra	China State Construction	Southern Co
SCA	China Yuran	Kone	National Grid
Stora Enso	Bunge	Fluor	Iberdrola
Rayonier	Golden Agri	Bouygues	ENEL
Mead	Smithfield	Grupo ACS	Exelon
Oji	Associated British Food	Orascom Construction	RWE Group
Plum Creek	Wilmar	China Railway Group	Dominion Resources

^{vii} <http://www.forbes.com/global2000/>



Authors

James Bonner, Independent Consultant

Annelisa Grigg, Project Director, Natural Value Initiative

Dr Stephanie Hime, Lead Specialist, Biodiversity and Ecosystem Services, KPMG in the UK Climate and Sustainability Services

Gordon Hewitt, Sustainability Advisor, ACCA

Rachel Jackson, Head of Sustainability, ACCA

Mike Kelly, Head of Corporate Responsibility, KPMG in the UK

Acknowledgements

The authors would like to thank the panel of experts who kindly reviewed and commented on this report and guided their work: Stuart Anstee (Rio Tinto), Julia Baker (Balfour Beatty), Tim Copnell (KPMG), Paul Herbertson (FFI), Paul Holland (KPMG) Richard Martin (ACCA), Ivo Mulder (UNEP FI), Gail Smith (Unilever), Jan-Kees Vis (Unilever), Lara Yacob (Robeco) and Prof. Ian Bateman (Valuing Nature Network).

Thanks are also due to those companies and their staff who consented to be interviewed: John Bason (Finance Director, ABF), Rosanna Bolzoni (Investor Relations Socially Responsible Investment Manager, Eni), Antonio Pinto (Vice President – Planning and Control, Eni), Claudia Vignati (Investor Relations Vice President, Eni) Vanessa Harvard-Williams (Partner, Linklaters), Andrew King (CFO, Mondli), James Singh (Executive Vice President & Chief Financial Officer (recently retired), Nestlé), Chris Brett (Senior Vice-President, Head of Corporate Responsibility & Sustainability, Olam) Jean-Marc Huet (CFO, Unilever), Thomas Lingard (Global Advocacy Director, Unilever), Roger Seabrook (Vice-President of Investor Relations, Unilever) and Russ Houlden (CFO, United Utilities).

Finally, the authors would like to thank the steering committee and investor collaborators of the Natural Value Initiative for their feedback on this report: Liz Crosbie, Nick Bertrand, Sean Gilbert, Julie Gorte, Alejandro Litovsky, Mike Radcliffe and Kerry ten Kate.

Contacts for further information

ACCA

Rachel Jackson
Head of Sustainability
rachel.jackson@accaglobal.com

Natural Value Initiative

Paul Herbertson
Director, Environmental Markets, Fauna & Flora International
paul.herbertson@fauna-flora.org

KPMG in the UK

Stephanie Hime
Lead specialist biodiversity and ecosystem services, KPMG in the UK Climate and Sustainability Services
stephanie.hime@kpmg.co.uk

© 2012 ACCA, Flora & Fauna International and KPMG LLP, a UK member firm. All rights reserved.

KPMG LLP, a UK limited liability partnership, is a subsidiary of KPMG Europe LLP and a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative, a Swiss entity.

Disclaimers:

The information contained herein 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 particular situation.

KPMG's participation and contribution in this regard is not an endorsement, sponsorship or implied backing of ACCA or Flora and Fauna International.

Design and layout by: Faye Arrowsmith, Flago Design www.flago-design.co.uk

Endnotes

- ¹ Joshua Bishop (ed.) (TEEB), *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010.
- ² Tom D. Breeze, Stuart P.M. Roberts, Simon Potts, Simon G. Potts, *The Decline of England's Bees: Policy Review and Recommendations*, University of Reading, 2012.
- ³ *Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB*, TEEB, 2010
- ⁴ *The Economics of Ecosystems and Biodiversity: An interim report*, TEEB, 2008.
- ⁵ *Universal Ownership: Why Environmental Externalities Matter to Institutional Investors*, PRI & UNEP FI, 2010.
- ⁶ *Expect the Unexpected: Building Business Value in a Changing World*, KPMG, 2012.
- ⁷ Joshua Bishop (ed.) (TEEB), *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010.
- ⁸ Alex Leff, 'Costa Rica court annuls Infinito Gold concession', *Reuters*, 24 November 2010. <http://www.reuters.com/article/2010/11/25/costarica-gold-idUSN2425147520101125>
- ⁹ *Consolidated Financial Statements For the Years Ended March 31, 2011 and 2010*, Infinito Gold Ltd., 31 March 2011. http://www.infinitogold.com/i/pdf/2011Q4_FS.pdf
- ¹⁰ 'Peru's Buenaventura: Minas Conga Reservoirs to Cost About \$150 Million', *The Wall Street Journal*, June 2012. <http://online.wsj.com/article/BT-CO-20120627-713933.html>
- ¹¹ *Towards Integrated Reporting: Communicating Value in the 21st Century*, IIRC, 2011.
- ¹² *Convention on Biological Diversity, Article 2. Use of Terms*, UN Conference on Environment and Development, 1992.
- ¹³ Millennium Ecosystem Assessment, *Ecosystems and Human Well-being: A Framework for Assessment*, Island Press, 2003.
- ¹⁴ *Ibid.*
- ¹⁵ *Glossary*, Business and Biodiversity Offsets Programme (BOOP), 2009.
- ¹⁶ Millennium Ecosystem Assessment, *Ecosystems and Human Well-being: Opportunities and Challenges for Business and Industry*, World Resources Institute, 2005.
- ¹⁷ L. Braat and P. ten Brink (eds.), *The Cost of Policy Inaction: The Case of Not Meeting the 2010 Biodiversity Target*, European Commission, 2008.
- ¹⁸ 'Volkswagen - Por amor al Planeta', CSR Europe. http://www.csreurope.org/solutions.php?action=show_solution&solution_id=869
- ¹⁹ A. Grigg, M. Harper and S. Verbunt, *Tread Lightly. Biodiversity and Ecosystem Services Risk and Opportunity Management within the Extractive Industry*, The Natural Value Initiative, 2011.
- ²⁰ UK National Ecosystem Assessment, *The UK National Ecosystem Assessment: Synthesis of the Key Findings*, UNEP-WCMC, 2011.
- ²¹ Andrew White and Matthew Kiernan, *Corporate Environmental Governance: A Study into the Influence of Environmental Performance and Financial Performance*, Environment Agency, 2004.
- ²² HM Government, *Companies Act 2006*, 2006.
- ²³ Joshua Bishop (ed.) (TEEB), *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010: 132.
- ²⁴ Joshua Bishop (ed.), (TEEB) *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010:135; William Evison and Christopher Knight, *Biodiversity and Business Risk. A Global Risks Network briefing*, World Economic Forum, 2010.
- ²⁵ *The Time for Biodiversity Business*, IUCN, 2009.
- ²⁶ Adapted from Joshua Bishop (ed.) (TEEB), *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010: 135; William Evison and Christopher Knight, *Biodiversity and Business Risk. A Global Risks Network briefing*, World Economic Forum, 2010; UNEP, *Are you a Green Leader?*, UNEP-WCMC and UNEP DTIE, 2010.
- ²⁷ Taylor H. Ricketts, *Tropical Forest Fragments Enhance Pollinator Activity in Nearby Coffee Crops*, *Conservation Biology* 18, 2004: 1262–71.
- ²⁸ 'Colony Collapse Disorder: European Bans on Neonicotinoid Pesticides', *US Environmental Protection Agency*. <http://www.epa.gov/pesticides/about/intheworks/ccd-european-ban.html>
- ²⁹ 'About SCaMP', *United Utilities*. <http://corporate.unitedutilities.com/about-scamp.aspx>
- ³⁰ 'Big win against illegal logging in PNG', *ABC Radio Australia*, 27 June 2011. <http://www.radioaustralia.net.au/international/radio/onairhighlights/big-win-against-illegal-logging-in-png>
- ³¹ Niluksi Koswanage, 'Factbox: Nestle, "eco-friendly" palm oil and Kit Kat', *Reuters*, 17 May 2010. <http://www.reuters.com/article/2010/05/17/us-nestle-palmoil-idUSTRE64G3CJ20100517>
- ³² 'Xerox, Danone Drop Asia Pulp & Paper after Greenpeace Pressure', *Environmental Leader*, 3 April 2012. <http://www.environmentalleader.com/2012/04/03/xerox-danone-drop-asia-pulp-paper-after-greenpeace-pressure>
- ³³ *Biodiversity Barometer 2012*, Union for Ethical BioTrade, 2012. http://www.ethicalbiotrade.org/dl/BAROMETER_Web_2012_EN.pdf
- ³⁴ 'Unilever - Sustainable Tea Certification: Lipton & The Rainforest Alliance', *CSR Europe*. http://www.csreurope.org/solutions.php?action=show_solution&solution_id=726
- ³⁵ 'The UK public procurement policy on timber', *Central Point of Expertise on Timber*. <http://www.cpet.org.uk/uk-government-timber-procurement-policy>
- ³⁶ *Policy for Business Activities Related to Offshore Oil Drilling and Production*, West LB, February 2012. http://www.portigon.com/cm/content/portigon/i/en/ueber-portigon/unsere-verantwortung/nachhaltigkeit/_jcr_content/contentparsys/box_2/download_2/file.res/WestLB_Policy_Offshore_Oil_Drilling_and_Production.pdf; Charles Emmerson and Glada Lahn, *Arctic Opening: Opportunity and Risk in the High North*, Lloyd's and Chatham House, 2012. http://www.lloyds.com/~media/Files/News%20and%20Insight/360%20Risk%20Insight/Arctic_Risk_Report_20120412.pdf
- ³⁷ Adapted from Joshua Bishop (ed.) (TEEB), *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010: 135; William Evison and Christopher Knight, *Biodiversity and Business Risk. A Global Risks Network briefing*, World Economic Forum, 2010; UNEP, *Are you a Green Leader?*, UNEP-WCMC and UNEP DTIE, 2010.
- ³⁸ Risk levels are sourced from the following: *Is biodiversity a material risk for companies? An assessment of the exposure of FTSE sectors to biodiversity risk*, ISIS Asset Management (F&C Asset Management), 2004; *Biodiversity and Ecosystem Services: Bloom or Bust?*, UNEP FI, 2008; Biodiversity, Oekom Research & Eurosif, 2009.
- ³⁹ *Increasing Mainstream Investor Understanding in Natural Capital*, The University of Cambridge Programme for Sustainability Leadership (CPSL), 2011.
- ⁴⁰ *Approach for Reporting on Ecosystems Services: Incorporating ecosystem services into an organisation's performance disclosure*, Global Reporting Initiative, 2011.
- ⁴¹ Craig Hanson, Cornis van der Lugt, Suzanne Ozment, *Nature in Performance: Initial Recommendations for Integrating Ecosystem Services into Business Performance Systems*, World Resources Institute, 2011.

Endnotes

- ⁴² AA1000 Accountability Principles Standard 2008, AccountAbility, 2008.
- ⁴³ Sustainability Reporting Guidelines Version 3.1, Global Reporting Initiative, 2011.
- ⁴⁴ Joshua Bishop (ed.) (TEEB), *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010.
- ⁴⁵ *The Conceptual Framework for Financial Reporting*, International Accounting Standards Board, 2010; *Guide to Corporate Ecosystem Valuation: A framework for improving corporate decision-making*, WBCSD, ERM, IUCN and PWC, 2011.
- ⁴⁶ Joshua Bishop (ed.) (TEEB), *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010.
- ⁴⁷ *Ibid.*
- ⁴⁸ *Ibid.*
- ⁴⁹ *Ibid.*
- ⁵⁰ 'Peru's Buenaventura: Minas Conga Reservoirs to Cost About \$150 Million', *The Wall Street Journal*, June 2012. <http://online.wsj.com/article/BT-CO-20120627-713933.html>
- ⁵¹ Alex Leff, 'Costa Rica court annuls Infito Gold concession', *Reuters*, 24 November 2010. <http://www.reuters.com/article/2010/11/25/costarica-gold-idUSN2425147520101125>
- ⁵² Graph made from data at 'Infito Gold Ltd (IG:Venture)' Bloomberg Businessweek. <http://investing.businessweek.com/research/stocks/charts/charts.asp?ticker=IG:CN>
- ⁵³ Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources, International Finance Corporation, 1 January 2012.
- ⁵⁴ CDP Water Disclosure Global Report 2011: Raising corporate awareness of global water issues, Carbon Disclosure Project, 2011. <https://www.cdproject.net/CDPResults/CDP-Water-Disclosure-Global-Report-2011.pdf>
- ⁵⁵ A. Grigg, M. Harper and S. Verbunt, *Tread Lightly. Biodiversity and Ecosystem Services Risk and Opportunity Management within the Extractive Industry*, The Natural Value Initiative, 2011.
- ⁵⁶ 'Largest Open Pit Mine in North America Cause for Investor Concerns – Investors Representing \$170 Billion Urge EPA to Safeguard Alaska's Bristol Bay', *Trillium Asset Management*, 12 April 2011. <http://www.trilliuminvest.com/news-articles-category/advocacy-news-articles/largest-open-pit-mine-in-north-america-cause-for-investor-concerns-%E2%80%93-investors-representing-170-billion-urge-epa-to-safeguard-alaska%E2%80%93bristol-bay/>
- ⁵⁷ 'The Declaration', *Natural Capital Declaration*. <http://www.naturalcapitaldeclaration.org/the-declaration>
- ⁵⁸ *Corporate Sustainable Development Report 2009*, Holcim, 2009. http://www.holcim.com/holcimcms/uploads/CORP/SD_report_2009_projectfile/sustainable_development_report_2009_index.html
- ⁵⁹ Adapted from *Corporate Sustainable Development Report 2009*, Holcim, 2009. http://www.holcim.com/holcimcms/uploads/CORP/SD_report_2009_projectfile/sustainable_development_report_2009_index.html
- ⁶⁰ Alana George, Nick Edgerton and Tom Berry, *Mainstreaming Socially Responsible Investment (SRI): A Role for Government? Policy Recommendations from the Investment Community*, Institute for Sustainable Futures, 2005.
- ⁶¹ *Carrots and Sticks – Promoting Transparency and Sustainability: An Update in Trends in Voluntary and Mandatory Sustainability Reporting*, KPMG, Unit for Corporate Governance in Africa, GRI and UNEP, 2010.
- ⁶² 'The AA1000 Standards', *AccountAbility*. <http://www.accountability.org/standards/index.html>
- ⁶³ 'Exposure Drafts and Consultation Papers', IFAC. <http://www.ifac.org/publications-resources/isa-3000-revised-assurance-engagements-other-audits-or-reviews-historical-fi>
- ⁶⁴ Carmen Grabsch, Michael John Jones, Jill Frances Solomon, *Accounting for Biodiversity in Crisis: A European Perspective*. http://www.essex.ac.uk/ebs/research/cega/seminar_papers/Accounting%20for%20biodiversity%20in%20crisis%20v2%20Jan11.pdf
- ⁶⁵ 'Biodiversity threat will eclipse climate change economic impacts but still misses CEO and valuations radar – PwC study', *PwC*, 22 May 2010. <http://www.ukmediacentre.pwc.com/News-Releases/Biodiversity-threat-will-eclipse-climate-change-economic-impacts-but-still-misses-CEO-and-valuations-radar-PwC-study-egb.aspx>
- ⁶⁶ A. Grigg, Z. Cullen, J. Foxall and R. Strumpf, *Linking Shareholder and Natural Value: Managing Biodiversity and Ecosystem Services Risk In Companies with an Agricultural Supply Chain*, The Natural Value Initiative, 2009; A. Grigg, M. Harper and S. Verbunt, *Tread Lightly. Biodiversity and Ecosystem Services Risk and Opportunity Management within the Extractive Industry*, The Natural Value Initiative, 2011.
- ⁶⁷ A. Grigg, M. Harper and S. Verbunt, *Tread Lightly. Biodiversity and Ecosystem Services Risk and Opportunity Management within the Extractive Industry*, The Natural Value Initiative, 2011.
- ⁶⁸ 'Cement Sustainability Initiative', WBCSD. <http://www.wbcscement.org/>
- ⁶⁹ Wim Oosterhuis, *The Dutch Commitment: Transforming the Market to 100% Sustainable Palm Oil*, [http://rt9.rspo.org/ckfinder/userfiles/files/03_Wim_Oosterhuis_P1\(1\).pdf](http://rt9.rspo.org/ckfinder/userfiles/files/03_Wim_Oosterhuis_P1(1).pdf)
- ⁷⁰ 'Belgian Palm Oil Market Pledges To Become Sustainable By 2015', *RSPo*, 30 January 2011. http://www.rspo.org/sites/default/files/Press%20Release%20Belgian%20Alliance%20for%20Sustainable%20Palm%20OilFINAL_o.pdf
- ⁷¹ *Universal Ownership: Why Environmental Externalities Matter to Institutional Investors*, PRI & UNEP FI, 2010.
- ⁷² *Guide to Corporate Ecosystem Valuation: A Framework for Improving Corporate Decision-making*, WBCSD, ERM, IUCN and PWC, 2011.
- ⁷³ Millennium Ecosystem Assessment, *Ecosystems and Human Well-being: A Framework for Assessment*, Island Press, 2003.
- ⁷⁴ Adapted from *Guide to Corporate Ecosystem Valuation: A Framework for Improving Corporate Decision-making*, WBCSD, ERM, IUCN and PWC, 2011.
- ⁷⁵ Adapted from David W. Pearce, Anil Markandya, and Edwath B. Barbier, *Blueprint for a Green Economy*, Earthscan, London, 1989; 'Connecting the Dots: The nexus between business & ecosystems', WBCSD, 2009. www.wbcscd.org/web/connectingthedots.htm
- ⁷⁶ Joshua Bishop (ed.) (TEEB), *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010.
- ⁷⁷ *Ibid.*
- ⁷⁸ *Improving the Use of Environmental Valuation in Policy Appraisal: A Value Transfer Strategy*, Defra, Environment Agency, Natural England and Forestry Commission, 2010.
- ⁷⁹ 'Carrying out Willingness to Pay Surveys', *UKWIR*. <http://ukwir.forefront-library.com/reports/carrying-out-willingness-to-pay-surveys/94186>
- ⁸⁰ Nathalie Olsen, Joshua Bishop and Stuart Anstee, *Exploring ecosystem valuation to move towards net positive impact on biodiversity in the mining sector*, IUCN, 2011.
- ⁸¹ 'PPR Commits to Group Environmental Profit & Loss Account by 2015', *PPR*, 16 November 2011. http://www.ppr.com/sites/default/files/press-release/PPR_press_release_EnvironmentalPL_EN_161111.pdf
- ⁸² *The Quiet (R)Evolution in Expectations in Corporate Environmental Performance: Emerging Trends in the Uptake of Ecosystem Services*, BSR, 2012.
- ⁸³ *The Natural Choice: Securing the Value of Nature*, HM Government, 2011.
- ⁸⁴ Joshua Bishop (ed.) (TEEB), *The Economics of Ecosystems and Biodiversity in Business and Enterprise*, London and New York: Earthscan, 2010.
- ⁸⁵ 'Wealth Accounting and the Valuation of Ecosystem Services', *WAVES*. <http://www.wavespartnership.org/waves/>
- ⁸⁶ *A Smarter GDP: Factoring Natural Capital into Economic Decision Making*, WAVES, 2012.
- ⁸⁷ John Vidal, 'Bolivia enshrines natural world's rights with equal status for Mother Earth', *The Guardian*, 10 April 2011. <http://www.guardian.co.uk/environment/2011/apr/10/bolivia-enshrines-natural-worlds-rights>
- ⁸⁸ John Mburu, Lars Gerard Hein, Barbara Gemmill and Linda Collette, *Economic Valuation of Pollination Services: Review of Methods*, Food and Agriculture Organisation of the United Nations, 2006.
- ⁸⁹ Madsen, Becca, Nathaniel Carroll, Daniel Kandy, and Genevieve Bennett, 2011 Update: State of Biodiversity Markets. Washington, DC: Forest Trends, 2011. Available at: http://www.ecosystemmarketplace.com/reports/2011_update_sbdm.

