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CLIMATE CHANGE & SUSTAINABILITY SERVICES

Sustainable Insight

The Nature of Ecosystem Service Risks for Business

SPECIAL EDITION IN COLLABORATION WITH FAUNA & FLORA INTERNATIONAL AND UNEP FI

May 2011

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FAUNA & FLORA INTERNATIONAL

Fauna & Flora International

FFI is the world's first established international conservation body, founded in 1903. FFI acts to conserve threatened species and ecosystems worldwide, choosing solutions that are sustainable, are based on sound science and take account of human needs. Through its Global Business & Biodiversity Programme, FFI aspires to create an environment where business has a long-term positive impact on biodiversity conservation.

www.fauna-flora.org

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www.unepfi.org

Abstract

Biodiversity and Ecosystem Services (BES) degradation and loss has gained business' attention in recent years. The Economics of Ecosystem and Biodiversity (TEEB) concluded that a higher public awareness of BES is leading to changes in consumer preferences and purchasing decisions, as a result of incontrovertible evidence of a global decline in BES. Global sales of organic food and beverages for example amounted to US$46 billion in 2007[1], a threefold increase since 1999. It also turns out there are considerable operational risks for many industry sectors that could even lead to systemic risks.

However, while a few leading businesses clearly understand the challenges, a considerable number of businesses that operate in environmentally sensitive sectors, such as extractives, construction, agribusiness, and even finance, do not appear to have this matter fully on their radar screen. So why have some companies woken up to the challenge - dependency and impact on BES - whilst others are yet to fully understand it?

In this issue of Sustainable Insight KPMG, Fauna & Flora International (FFI) and the United Nations Environmental Programme Finance Initiative (UNEP FI) review the extent to which companies are prepared to deal with BES challenges and examine whether this response reflects the magnitude of corporate impacts and dependencies on BES. In this report we seek to identify the types of risks companies are exposed to and examine the extent of corporate response based on a range of corporate management benchmarking studies.

The levels of risks differ according to the nature of the company, its products, geographic location and its ability to mitigate risk by substituting raw materials gained from ecosystem services or shifting operations to less sensitive locations.

Our analysis showed the following sectors to be high risk, either in terms of their impact or dependence on BES or the level of maturity of their management of the issue; food & beverage, oil & gas, and mining (including minerals) sector. Also banks should take notice of their exposure to BES risks, due to the low level of awareness and hence response to this new challenge. Not all sectors demonstrated management activity proportional to the risks posed by the issue.

We aim to show businesses a number of ways to move forward on this issue, based on the recommendations of The Economics of Ecosystems and Biodiversity (TEEB) for Business report. We provide viewpoints and highlight examples of companies that take action to turn risk into opportunities, highlighting the importance of a strategic approach and a focus on risk evaluation and effective monitoring and communication. We conclude that companies with progressive thinking will increasingly grasp opportunities and gain competitive advantage by proactively managing this issue.

The Business of Biodiversity

The Global Picture

World output will treble by 2050, as growth accelerates linked to emerging markets[2]. We are currently using the equivalent of '1.5 planets'[3] to meet our needs. While energy availability and security may or may not hinder development – depending on major investments in energy efficiency and low-carbon alternatives – a whole suite of ecosystem services that are essential to business as usual, are becoming increasingly scarce. We predict a future where a lack of ecosystem services will act as a constraint to economic growth, where perverse subsidies may be overturned, and where policy and regulation encourages the internalisation of environmental costs currently born by society.

Global interlinked and reinforcing phenomena such as biodiversity loss, water scarcity, extreme weather events and other climate change impacts have profound business relevance. Food security is fundamentally linked to continued access to ecosystem services such as pollination, nutrient cycling in soils and the provision of water in the right quantity and quality. Biodiversity is essential to enable the world to mitigate and adapt to climate change, whether it is through reducing emissions from deforestation and degradation, or maintaining coastal marshes, mangroves and coral reefs in order to adapt to coastal surges.

Affecting the bottom-line

Corporate impacts on biodiversity and ecosystem services have historically been a source of reputational risk for companies. Such risks, arising from NGO campaigns such as campaigns targeting retailers and food producers on soy, fish and palm oil, impact largely on intangible assets with only a weak connection to financial value. Recently, however, attention has shifted to how companies are dependent on biodiversity and ecosystem services. This shift has given rise to a much wider array of risks with a tangible impact on the bottom line, ranging from tightening regulation, to challenges in accessing finance and a narrowing of operating margins through increased costs of raw materials. The World Economic Forum (WEF) in its global review of risk[4] concluded that the consequences of BES loss would affect growth objectives of most industry sectors in the developed and emerging economies.

BP has incurred significant costs as a result of the Deepwater Horizon accident in the Gulf of Mexico with severe impacts on ecosystem services such as fisheries and tourism. Mining company Vedanta was prevented from developing a US$ 2.7 billion mine in Orissa, India due to concerns about environmental impacts and human rights[5]. Clearly, this issue is beginning to hit the bottom line beyond the occasional anecdotal example.

Companies that anticipate and prepare for a resource constrained future are likely to protect margins by reducing costs in the supply chain, gaining access to new markets and creating customer leverage.

> Financial stability may already be affected by environmental phenomena that manifest themselves through 'slow failures and creeping risks' in the context of ecosystem loss and degradation.
>
> ***UNEP FI, 2010. CEO Briefing – Demystifying Materiality [8]***

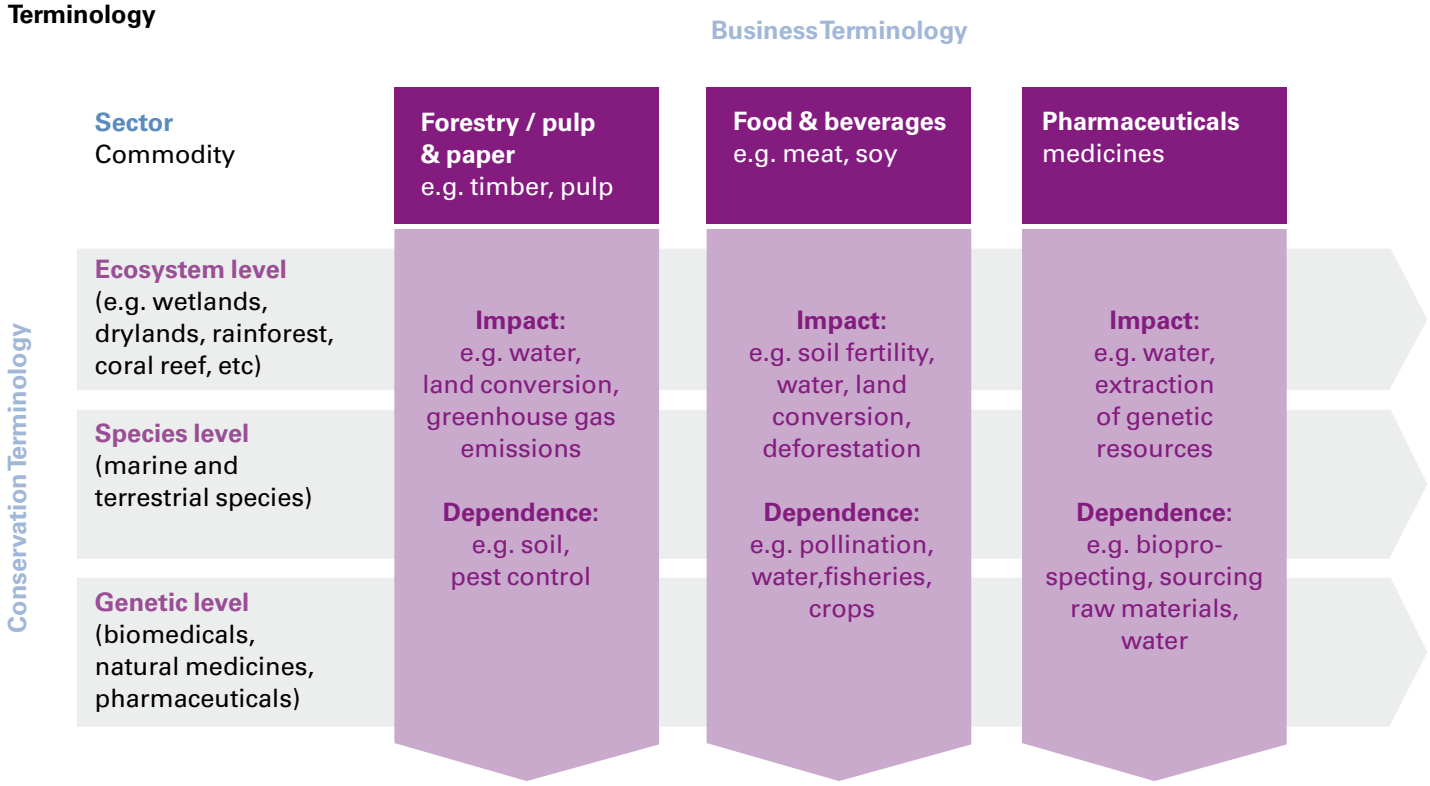
Demystifying Biodiversity and Ecosystem Services for Business

Biodiversity is commonly defined as 'the variability among living organisms, which includes the diversity at ecosystem, species and genetic levels' – as stated in article 2 of the Convention on Biological Diversity. Humankind benefits from a multitude of resources and processes that are supplied by natural ecosystems. Collectively, these benefits are known as ecosystem services and include products like clean drinking water and processes such as the decomposition

of wastes. The Millennium Ecosystem Assessment[6] identified four main categories of ecosystem services: provisioning, regulating, cultural and supporting. In the context of this publication, and to aid clarity these terms are combined under the term biodiversity and ecosystem services or 'BES'.

Many businesses already deal with BES, without thinking about it or naming it so. Pharmaceutical companies and biotechnology companies, for instance, depend on the availability of genetic diversity for their products. The pharmaceutical industry derived 25-50% of the US$ 640 billion from genetic resources[7].

Figure 1:
Conservation and Business Terminology



Turning Risk into Competitive Advantage

In this Sustainable Insight we aim to provide an overview of the impact and dependence on BES for a number of industry sectors versus the level of preparedness of that sector to respond to the issue.

Impact and Dependency

Modern day risk management and strategy development require a holistic perspective to identify, manage and price environmental, social and governance (ESG) issues. To date, a somewhat limited perspective has been taken of BES as an issue. Corporate impact on biodiversity has been the focus of concern, rather than corporate dependence on ecosystem services. A focus on dependence gives rise to a whole range of risks, which vary from sector to sector. In this Insight, we look at both.

"As of today, an accurate methodology, or range of methodologies, for measuring the business risks of biodiversity and ecosystem services still needs to be established. Until then, it will be difficult for companies to develop ways of addressing or offsetting these risks"

Matt Hale, Bank of America Merrill Lynch

Types of Risks

There are numerous ways of labelling risks and to integrate them in general and more tailored corporate risk and compliance models. To maintain a general perspective in this edition, we focus on some of the most common types of risks related to BES issues. These include:

Reputational risk

Companies that are associated with adverse impacts on BES are exposed to damage to a company's brand and reputation and subsequently their ability to sell products or gain access to finance. In the United States, a growing number of banks, such as Credit Suisse, Morgan Stanley, JPMorgan Chase, Bank of America and Citigroup, have increased scrutiny of lending to companies involved in mountain top-removal mining, or have ended the lending altogether.[9]

Regulatory risk

Governments can restrict company access to areas that are important from a biodiversity perspective, require (new) environmental impact assessments, or require compensation for damage to ecosystems. For example, during the Convention on Biological Diversity (CBD) biannual conference in Nagoya in October 2010 – CBD COP 10 – governments agreed on 47 decisions, some of which are relevant for businesses. One concerned a decision to increase terrestrial protected areas to 17 percent (from around 11 percent) of land area and marine protected areas to 10 percent (from around 1 percent).[10]

Operational risk

Operational challenges can manifest themselves in a myriad of ways, including a disruption of inputs in company processes, like water availability and quality, the potential of provisioning services like fish, and other forms of ecological degradation or natural disasters that lead to loss of outputs.

Legal liability risk

Businesses can be held liable for their impacts on BES. The most noteworthy development is the EU Environmental Liability Directive. During the CBD COP 10 an agreement was reached on 'access and benefit sharing', a contentious issue discussed for many years. The agreement stipulates that the financial benefits arising from the sourcing of genetic materials need to be shared in a fair and equitable way that includes indigenous and local communities.

Systemic risk

BES may become a systemic risk when it has far reaching implications for the profitability and survival of a sector. In the case of fruits and vegetables, a sub sector within agriculture, many crops depend on pollination by bees and other insects. When pollinator colonies collapse it can have far reaching implications for this sub-sector. It could even affect lenders with large loan portfolios in such sub-sectors.

Preparedness
Over the years, a number of analyses have been undertaken by the Natural Value Initiative (NVI),[11] Insight Investment[12] and others (see Appendix B) on the quality of corporate management of biodiversity and ecosystem services. KPMG, UNEP FI and FFI have used the results from analyses of 123 companies across 9 sub sectors as a proxy for the level of preparedness or response in the respective sectors.

The following criteria are commonly used to assess preparedness and form the basis of our analysis. Depending on the sector other criteria have been added to these as well. They can be found in Appendix A.

Policy and strategy
The extent to which there is a consistent policy and strategic framework in place for driving improvement, managing risk and opportunity, and guidance/ standards to aid implementation.

Governance
The extent to which there are processes in place to engage with stakeholders, and undertake a formal risk and opportunity evaluation linked to impact and dependence on biodiversity and ecosystem service.

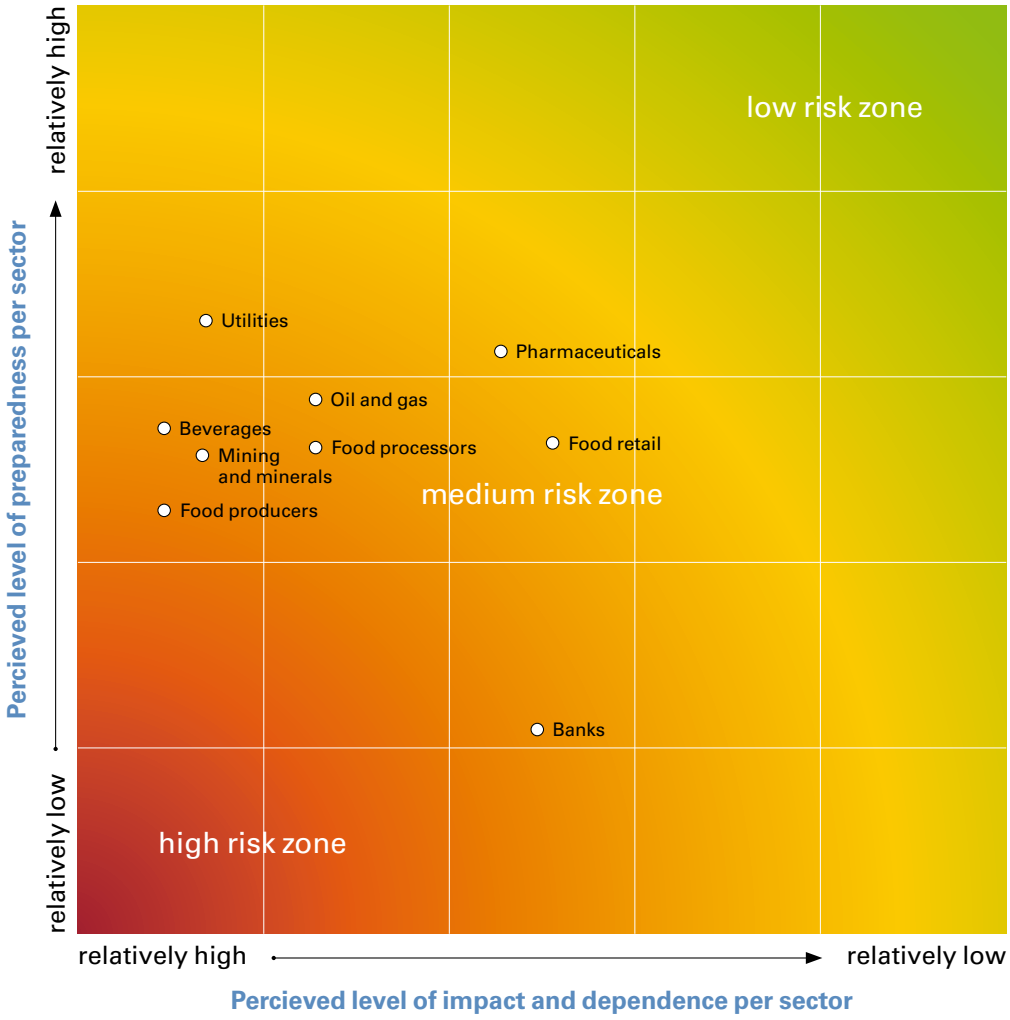
Management and implementation
The extent to which tools, training and assurance processes are in place for managing biodiversity and ecosystem services at site level or within the supply chain.

Reporting
The extent to which the company has internal and external reporting processes, policies and indicators which report progress against stated targets and standards on sustainable sourcing (focusing on impacts and dependence on biodiversity and ecosystem services).

"The three main areas of interest for business to identify risks related to biodiversity and ecosystem services concern the following: 1) The need for companies to insulate themselves against short-term market pressure to look at the long-term horizon; 2) build group-wide engagement on this issue; and 3) build consumer preference and reflect it in the brand value of your company."

Herman Mulder,
Worldconnector, Advisory Board TEEB, former DG,
Head group risk management ABN-AMRO

Figure 2:
Summary of Findings on Impact and Dependence versus Preparedness



The Risk Landscape

The overall level of risk faced by a company or sector is may be more susceptible to a combination of reputational risks, operational risks and regulatory risks. Companies further up the supply chain or that operate 'upstream' may be more susceptible to operational and regulatory challenges, while companies down the supply chain often have a greater degree of public exposure and therefore to potential reputational risks. Until now, however, this link has not been systematically reviewed for all sectors.

The analysis, therefore, is meant to foster the discussion on this issue within sectors and companies to consider and discover competitive advantages by managing impacts and dependencies systematically.

Given the differences in the methodologies of the reports analysed, though, the present results should be seen as a starting point for debate, rather than a comprehensive, sector by sector scientific analysis of risk and risk management activities. For more details on our methodology, sources and the limitations of our analysis see Appendix B.

Our analysis showed the following sectors to be high risk, either in terms of their impact or dependence on BES or the level of maturity of their management of the issue; food & beverage, oil & gas, and mining (including minerals) sector. Compared to other sectors with a 'moderate' risk profile such as the pharmaceutical and food retail sectors, the banking sector shows a relatively low level of response or preparedness to deal with this issue. Utility companies, whilst considered high risk in terms of impact and dependence alone, are featured in the medium risk zone due to their relative high level of preparedness.

The preparedness within the pharmaceutical industry is only analyzed with regard to high risk issues. Therefore the results for preparedness in this industry might be overestimated.

The risk of the oil & gas sector may be underestimated because the sources available do not yet take into account recent spills and the movement of the industry to sensitive environments such as the Arctic or deepwater locations.

Moving Forward

To facilitate further integration of BES into key processes within companies, The Economics of Ecosystems and Biodiversity (TEEB)[11] study made the following recommendations for corporate action:

1. Identify the impacts and dependencies of your business on biodiversity and ecosystem services

2. Assess the business risks and opportunities associated with these impacts and dependencies

3. Develop BES information systems, set targets, measure and value performance, and report your results

4. Take action to avoid, minimize and mitigate BES risks, including in-kind compensation ('offsets') where appropriate

5. Grasp emerging BES business opportunities, such as cost-efficiencies, new products and new markets

6. Integrate business strategy and actions on BES with wider corporate social responsibility initiatives

7. Engage with business peers and stakeholders in government, NGOs and civil society to improve BES guidance and policy.

Central to the TEEB recommendations is the need for a analysis of risks and opportunities and effective communication to stakeholders. We outline below some of the steps business can take in following these recommendations.

Analysis of Risks and Opportunities

Although a number of tools and approaches have emerged to assist companies in understanding their risk and opportunity profile, there is no commonly accepted roadmap for companies to address, integrate and manage BES risks and opportunities in a systematic way.

The Natural Value Initiative's analysis of the food, beverage and tobacco sector, for example, revealed that, despite a clear reliance of the companies evaluated on an agricultural supply chain dependent on healthy biodiversity and continued access to ecosystem services, only 48 percent of the companies had a well-communicated risk and opportunity assessment in place.[12]

Without a clear roadmap for action, based on a comprehensive analysis of the business impacts and dependence on ecosystem services, it is challenging for companies to adopt a proactive rather than a reactive approach to the issue.[13]

While we recommend the use of more sophisticated tools tailored to their holistic Governance Risk and Compliance (GRC) models over time, we suggest companies start using simple checklists as shown in appendix C or one of the available tools to evaluate the level of risk and opportunity within a company.

> "There should be improved reporting and disclosure to mitigate investor risk. Companies that are listed on our major stock exchanges should as a minimum be obliged to report how they are dependent on ecosystem services and how they are impacting on it."
>
> ***Courtney Lowrance, Director of Environmental and Social Risk Management, Citi***

Report quantitative KPI's and financial implication

The information on BES presented in most company reports is rarely set out in a way that communicates that key risks have been identified. Policy and position on the issue is frequently unclear, strategies to manage risks and realize opportunities are undisclosed and unaudited. The terms biodiversity and ecosystem services are not always used in CSR reports even if the content clearly reflects the issues. This is not a bad thing – indeed, BES is a difficult concept to communicate to stakeholders and for many stakeholders reporting on BES related issues makes a lot of sence. This, however, makes it more difficult and time consuming to benchmark or identify the number of companies that report on BES using one single and widely accepted definition. It is clear that more quantitative KPIs and greater disclosure on the issue is a first step in securing a more complete understanding of impacts of managing (or mismanaging) BES on the corporate bottom line. Work is currently underway by the Global Reporting Initiative (GRI) to define ecosystem services indicators and this is an encouraging first step towards more consistent disclosure on this issue.

Sustainability's main drivers are changing.

Although regulatory requirements, brand enhancement and risk management remain key drivers of sustainability, cost reduction is also a key rationale. The primary focus is on the environmental side, in particular with regard to resource and energy efficiency. Forty-four percent of executives agree sustainability is a source of innovation, and 39 percent see it as a source of new business opportunities.[14]

There are also numerous ways to turn BES risk into opportunities to enhance overall business performance. Either after analysis of risks and opportunities, or more brutally, incurred by a sudden wake-up call from stakeholders and quick changes in the availability of ecosystem services. Good examples are known in the following categories:

- **Market differentiation**
  Companies create a specific niche in the market with new (lines of) products inspired by nature or with a consideration of BES issues far beyond their competitors, for example through the use of biomimicricy.
- **Environmental markets**
  Sale of specific (financial) products to gain from the need for business to globally address BES issues.
- **Markets for certified products**
  Production for the fast growing market for certified products that ensure full consideration of BES issues.
- **Sustainable and continued sourcing**
  Finding ways to continue or improve crucial ecosystem services by ensuring the integrity of the supply chain thereby avoiding (future) reputational risk and maintaining profit margins.

"The ultimate aim is to try to make sustainable production practices and biodiversity conservation as or more profitable than unsustainable practices or the conversion of biodiversity. We are still a long way from that and I think some entrepreneurs and investors are trying to show that that can be the case and have some good progress in some sectors."

Joshua Bishop, Chief Economist, IUCN

Figure 3:
Summary of Actions to turn Risk into Opportunities

BES issue	Sector	Company	Type of action	Competitive Advantage
Decline of pollination	Food and Beverages	Innocent and Haagen Dazs[15]	Projects and marketing campaign around the honey bee. Link concerns regarding declining pollinators and continued ability to source ingredients.	Market differentiation
Loss of threatened species	Financial Sector	New Forests[16]	Financial products linking biodiversity and ecosystem services to the markets. Value of biodiversity mitigation or offsets: US$1.8 - 2.9 billion in 2008. A number of investors, such as New Forests, are active in US wetland mitigation and conservation banking.	Environmental markets
Deforestation	Tobacco	British American Tobacco[17]	Biodiversity risk and opportunity assessment tool showed deforestation in critical Indonesian watersheds. Reduced water supply to agricultural areas including the tobacco growing area. British American Tobacco and local partners are now developing a plan for the protection of the watershed through measures including reforestation.	Sustainable and continued sourcing
Deforestation	Food and Beverages	Friesland-Campina[18]	Solidaridad, World Wide Fund and the Roundtable on Responsible Soy have established the Soy Producer Support Initiative (SOYPSI) to support small farmers and agricultural workers, and help them prepare for certification. Through the programme, FrieslandCampina supports farmers in southern Brazil and India so that they can make their soy cultivation more sustainable by paying the farmers a fair price, limited use of pesticides, avoidance of soil depletion and not buying soy from areas where valuable habitats have been cleared. Certificates are traded separately from the product itself. FrieslandCampina buys certificates that correspond to a volume of milk. The revenue from the certificates goes to a NGO to help farmers produce soy more sustainably.	Sustainable and continued sourcing
Loss of biodiversity	Cosmetics	Natura[19]	The Brazilian cosmetic company Natura developed an entire product line (Ekos) to leverage its brand in the marketspace.	Market differentiation
Loss of biodiversity	Food and Beverages	Marine Stewardship Council (MSC)[20]	Consumer sales of certified products are growing rapidly; sales of MSC products worldwide grew by 67% from April 2008 to March 2009.	Markets for certified products
Loss of ecosystem services	Land intensive industies	Extractive industries	Review the value of ecosystem services within their land holdings to identify potential assets as well as risks.	Environmental markets
Loss of ecosystem services	Consumer Markets	Marks & Spencers[21]	Corporate responsibility programme to substantially increase M&S' sourcing of sustainable raw materials. Focus on agriculture, marine and freshwater issues. Important elements include: detailed risk assessments for fish, palm oil, timber, cotton and water. Implementation of standards on biodiversity management and action plans; water management; integrated pest management with responsible pesticide use; non-GM and organic produce.	Sustainable and continued sourcing
Resource Scarsity	Diversified Industrial products	InterfaceFlor and Desso[22]	Strong profiling on sustainable carpets. Desso has several cradle-to-cradle certified products and InterfaceFlor develops products that utilise techniques and ideas inspired by the natural environment. Their TacTile line uses non glue adhesive technology to stick on surfaces – inspired by the ghecko's convoluted feet. They have also developed a tile design based on random patterns found in the natural environment, thereby reducing wastage in carpet tile laying.	Market differentiation

Expert Viewpoints – Financial Perspective

For this issue of Sustainable Insight KPMG consulted independent experts who look at biodiversity from a financial (risk) perspective within UNEP FI, Banks and NGOs. We were especially interested in their viewpoints on the way companies should move forward and in particular the keys areas of interest for companies looking to identify their business risks related to biodiversity and ecosystem services, and cost-saving opportunities or increased market share. We feel fortunate to being allowed to include their quotes. The overall viewpoints can be summarised as follows.

Focus on water, reputational risk and supply chain issues

The overall three main areas of interest for companies that want to identify their business risks related to BES are water, reputational risk and supply chain issues. Firstly, water is clearly causing global concern as fresh water scarcity might affect companies' own operations and their supply chain. Delivery of water in the appropriate quantity and quality is closely linked to the presence of healthy, functioning ecosystems. Forests play a role in regulating rainfall; vegetation more broadly prevents soil erosion and siltation of waterways. Wetlands play a vital role in maintaining water quality. Failing to consider BES, as part of a broader management plan will result in ineffective – or more costly – risk mitigation strategies.

A second key area of concern is linked to reputational risk or loss of social license. When a company is converting natural habitat to an alternative land use, this may attract attention of NGOs or local communities. Land conversion and carbon emissions – in particularly the implications of land conversion and habitat loss for food production - are becoming increasingly important. 24-hour news services and the use of social media networks can act to amplify an issue within a couple of hours.

Thirdly, companies need to understand impacts and dependence throughout their value chain. Lack of an ability to influence an issue is not seen as a sufficient reason for a company not to act – the retail sector and the issue of palm oil illustrates this very clearly. Companies that look at the impacts of their supply chain as a result of BES factors often learn surprising things, exposing new risks or hidden opportunities.

Progressive Thinking Creates Value

Many companies first come across the issue of biodiversity from a risk perspective. But they quickly see that when risk is well managed it can be turned into an opportunity. It could become a brand enhancer leading to greater market share and reputational benefits. Companies that are more progressive in their thinking may create value and save costs by working with their supply chain to improve the resilience of the supply chain inputs to their business. Ideally, group wide engagement on the issue of ecosystems should be reflected in internal approval procedures, risk self-assessments, key performance indicators and research and development (i.e. finding natural solutions). In general, there is a great need for an accurate methodology for measuring the business risks associated with BES, which will support the ability for companies to incorporate these risks and value potential reputational benefits.

There will be winners and losers on this issue. Any company which is proactively investing natural capital – e.g. through impact investing or through sustainable certification of products – must accept that cost price goes up initially. However, those who are proactive and strategic in their approach can realise cost savings. In the long term, companies that have their impacts and dependencies laid out, evaluated and anticipated will win in a more mundane profit-and-loss point of view.

Conclusion

Although current research and trends show that BES is moving up the business agenda, increased communications between companies, investors and other stakeholders is needed before the issue will be managed effectively. A logical starting point for companies wishing to move forward on this issue is to consider how BES can impact on existing strategies on climate change or water.

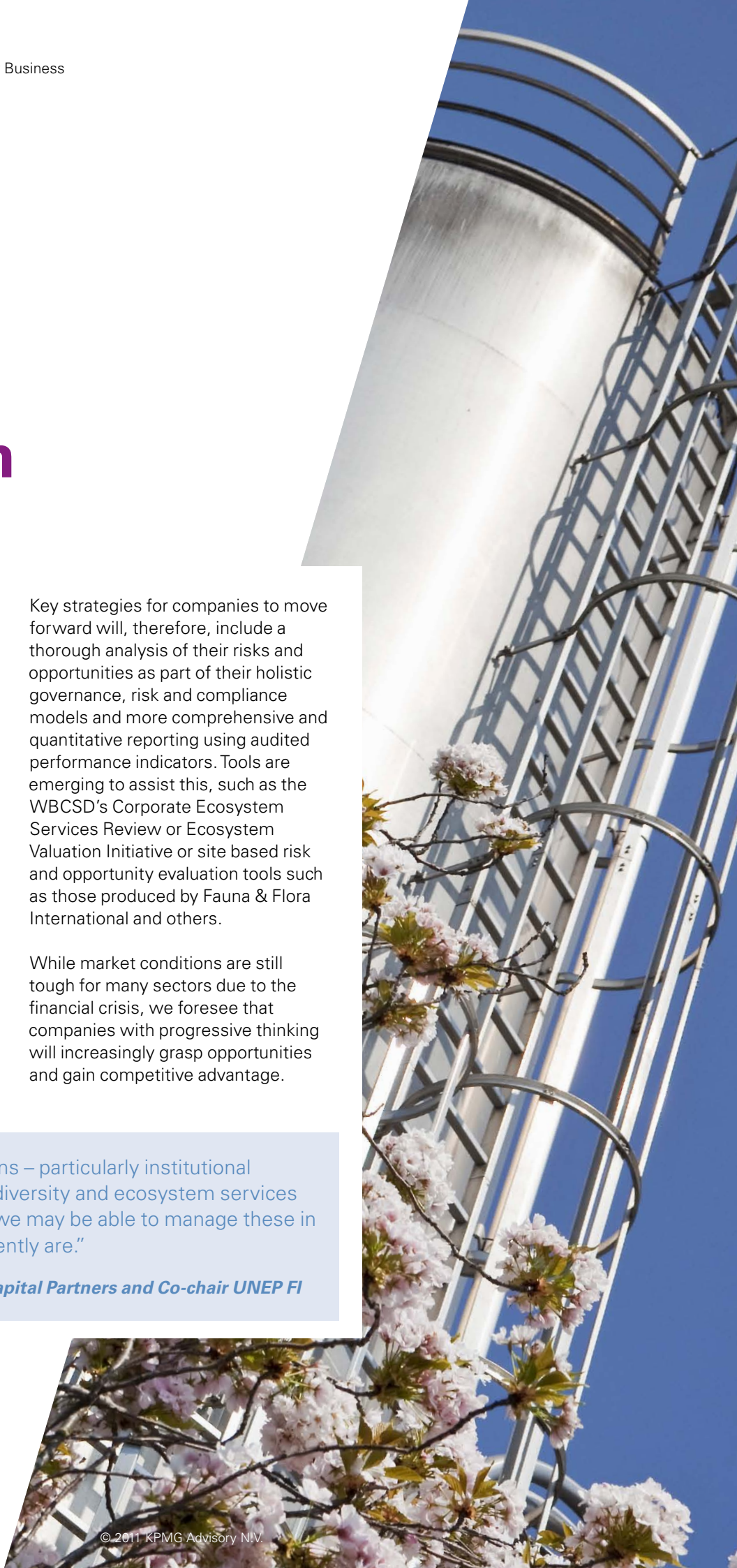
While a number of asset owners and mutual funds now evaluate companies on the sophistication and strength of their sustainability programs and include the outcomes in their investment decisions, a consistent framework to analyse and measure risks and opportunities related to BES within and across sectors from the perspective of investors and other stakeholders is missing.

Key strategies for companies to move forward will, therefore, include a thorough analysis of their risks and opportunities as part of their holistic governance, risk and compliance models and more comprehensive and quantitative reporting using audited performance indicators. Tools are emerging to assist this, such as the WBCSD's Corporate Ecosystem Services Review or Ecosystem Valuation Initiative or site based risk and opportunity evaluation tools such as those produced by Fauna & Flora International and others.

While market conditions are still tough for many sectors due to the financial crisis, we foresee that companies with progressive thinking will increasingly grasp opportunities and gain competitive advantage.

"I think that if financial institutions – particularly institutional investors – are able to value biodiversity and ecosystem services criteria in investment holdings, we may be able to manage these in a much better way than we currently are."

Richard Burrett, Partner at Earth Capital Partners and Co-chair UNEP FI



References

No	Date	Title	Organisation
1	2010	The Economics of Ecosystems and Biodiversity: Report for Business - Executive Summary	TEEB
2	2011	The world in 2050 – Quantifying the shift in the global economy	HSBC
3	2010	Ecological Footprint Atlas	Global Footprint Network
4	2011	Sixth Global Risks 2011 report	World Economic Forum
5	2010	India rejects Vedanta's Orissa mine plan 25th August 2010 http://www.telegraph.co.uk/finance/newsbysector/epic/ved/7962276/India-rejects-Vedantas-Orissa-mine-plan.html	The Telegaph
6	2005	Ecosystems and Human well-being: Biodiversity synthesis report	Millennium Ecosystem Assessment
7	2010	Biodiversity and ecosystem services - Risk and opportunity analysis within the pharmaceutical sector	Robeco, Natural Value Initiative, KPMG
8	2010	Demystifying Materiality: Hardwiring Biodiversity and Ecosystem Services in Finance	UNEP FI
9	2010	Banks Grow Wary of Environmental Risks	New York Times (30 August 2010)
10	2010	CBD COP documents. http://www.cbd.int/cop10/doc/	Convention on Biological Diversity
11	2010	The Economics of Ecosystems and Biodiversity: Report for Business	TEEB
12	2009	Linking shareholder and Natural Value - Managing biodiversity and ecosystem services risk in companies with an agricultural supply chain	The Natural Value Initiative (Grigg et al.)
13	2005	Protecting shareholder and natural value - 2005 benchmark of biodiversity management practices in the extractive industry	Insight Investment and Fauna & Flora International (FFI)
14	2011	The Economics of Ecosystems and Biodiversity: Report for Business - Chapter 7	TEEB
15		http://www.innocentdrinks.co.uk/bees/map.cfm and http://www.helpthehoneybees.com/	Innocents Haagen Dasz
16	2010	State of Biodiversity Markets Report: Offset and Compensation Programs Worldwide.	Ecosystem Marketplace (Madsen et al.)
17	2010	Biodiversity risk and opportunity assessment	British American Tobacco
18	2010	CSR report 2009	FrieslandCampina
19	2008	Natura's Ekos: Perfume Essences Produce Sustainable Development in Brazil	Boechat, C. and Mokrejs, R.
20	2009	MSC labelled seafood in shops and restaurants	Marine Stewardship Council
21	2011	http://plana.marksandspencer.com/	Marks and Spencer
22	2011	http://interfaceflor.eu and http://www.desso.com	InterfaceFLOR and Desso
23	In press	Hardwiring Green – How Banks Account for Biodiversity and Ecosystem Services	Mulder I. and Koellner T.

Appendix A

Reports reviewed for the cross-sector analysis

Date	Titles impact-dependence perspective	Organisation
2004	Is biodiversity a material risk for companies?	F&C Management
2008	Bloom or Bust	UNEP FI
2010	Demystifying Materiality: Hardwiring Biodiversity and Ecosystem Services in Finance	UNEP FI
2010	Biodiversity – Theme report – 2nd in a series	Eurosif – Oekom
2010	'COP' Out? Biodiversity loss and the risk to investors	EIRIS
Forthcoming	The Economics of Ecosystems and Biodiversity Report for Business	TEEB
	Environmental Health and Safety; sector guidelines	World Bank / IFC

Date	Titles preparedness perspective	Organisation
2009	Linking shareholder and Natural Value - Managing biodiversity and ecosystem services risk in companies with an agricultural supply chain	The Natural Value Initiative (Grigg et al.)
2005	Protecting shareholder and natural value - 2005 benchmark of biodiversity management practices in the extractive industry	Insight Investment and Fauna & Flora International (FFI)
In press	Hardwiring Green – How Banks Account for Biodiversity and Ecosystem Services	Mulder I. and Koellner T.
2010	Biodiversity and ecosystem services - Risk and opportunity analysis within the pharmaceutical sector	Robeco, Natural Value Initiative, KPMG

Experts consulted

Name	Function	Organisation
Bishop, J	Chief Economist	International Union for the Conservation of Nature (IUCN)
Burrett, R	Partner Co-chair	Earth Capital Partners UNEP FI
Hale, M	Managing Director	Bank of America Merrill Lynch
Lowrance, C	Director of Environmental and Social Risk Management	Citi
Mulder, H	Worldconnector, Advisory Board Former Director-General, Head Group Risk Management	TEEB ABN Amro

Appendix B

The methodology used to analyse the 'impact and dependence versus preparedness' is derived from an earlier KPMG International publication – Climate Changes your Business. We analysed authoritative reports that either focus on the impact or dependence of businesses to BES or the extent to which they manage it.

How impact and dependencies were analysed

We looked at the overall risks as a combination of exposure to the different risk categories, which may be incurred by either impact or dependencies. A number of reports were reviewed that provided a calculation, assessment or indication of the level of risk that a particular sector or sectors face in relation to BES. Some of the reports reviewed were quite specific in the level of individual risks, whereas some reports – such as EIRIS (2010) – expressed the level of impact on BES as a measure of risk. Our methodology assigned different scores to each risk category:

- **High risk = 2 points.** A description in an analysed report indicating that the sector is running a high risk in the concerned risk category.
- **Medium risk = 1 point.** A description in an analysed report indicating that the sector is running a medium risk in the concerned risk category.
- **Low risk = 0 points.** Where the risk is negligible or not mentioned

Each of the risk categories received an equal weight, which means that the overall level of risk for a certain sector is the average of the different categories. The overall level of risk is the average over the reports that were reviewed. This means that the maximum average score is 2, and the minimum average score is 0. To translate this into a percentage we divided the average score by 2 and multiplied it with 100%.

For example, the TEEB report (chapter 4, table 4.1) lists 5 categories of risk: operational, regulatory, reputational, market/product and financing. For the categories "food producers" and "food processors" we calculated the level of risk as: 2 (operational risk) + 0 (regulatory risk) + 2 (reputational risk) + 2 (market/product risk) + 0 (financing) / 5 = 1.2 = 60%. The average level of risk for this sector is the sum of the scores of each report analysed divided by the sum of the reports.

How preparedness has been analysed

Within each sector a number of companies have been benchmarked on their performance of the above-mentioned categories. The overall result was calculated from a combination of these categories using equal weights for the different categories.

For example, in the "food retail" sector 7 companies were benchmarked. The average score can be calculated by taking the sum of the average per criteria multiplied by its respective weight: 60% (competitive advantage) x 20% + 59% (governance) x 20% + 52% (policy/strategy) x 20% + 41% (management and implementation) x 20% + 45% (reporting) x 20% = 51%.

Differences between the benchmarking approaches

In this edition of Sustainable Insight we highlighted how corporate preparedness has been assessed using a number of common criteria used by the NVI and others. In addition to the common criteria that have been explicitly mentioned in this Insight, each benchmarking framework also used slightly different criteria:

- **Leadership:** Demonstrate biodiversity best practice in emerging issues. This criteria was used by Insight Investment and FFI to analyse the oil and gas sector, mining and minerals sector and utilities.[13]

- **Competitive advantage.** Measures the extent to which business value is created or protected through company activity to ensure sustainable sourcing with a focus on biodiversity and ecosystem services. This criterion was used by the NVI in its evaluation of a number of sub sectors in food and beverages, as well as the pharmaceutical sector.[12]

- **Engagement and acknowledgement of indirect BES impacts.** In a benchmarking study of the banking sector[23] 'engagement' and 'acknowledgement of indirect BES impacts by the banking sector' were used as additional criteria.

We have translated the underlying issues into other risk categories to avoid leaving out important data for the overall scores.

Number of companies per sector

Our analysis is based on the following number of companies per sector:

- Beverages (6)
- Food retail (7)
- Food processors (8)
- Food producers (6)
- Pharmaceuticals (10)
- Banks (50)
- Utilities (10)
- Oil and gas (13)
- Mining and minerals (13)

Limitations of the methodology and the use of data

The extent to which companies are currently exposed to risks associated with BES is a function of the nature of the company, its geographic location and the sophistication of its management approach.

- The results do not provide an indication of differences within a sector. A growing number of companies are taking steps to better understand and manage their impacts and dependence on BES, thereby aiming to reduce exposure to the above-mentioned risks, while many of their peers are only taking basic steps or none at all.

- For some sectors, embedding the management of BES into the heart of business models and core strategies is vital for long-term growth and success.
For others, it will never be a material issue. We have chosen sectors that are frequently related to exposure to BES risks and opportunities. However, we are clearly aware that a considerable number of sectors have not been assessed, predominately because there was not data available. This is not to say that those sectors are not exposed to BES risks.

- Readers should take notice that the studies that were used to assess corporate preparedness to deal with BES issues were limited in sample size.

- We used the level how companies manage BES as a proxy for how prepared they are to deal with the challenges that arise from ecosystem degradation and biodiversity loss. It should be stressed that a company that manages BES is not by default prepared to deal with its risk exposure to BES.

- In addition, we stress that results will quite likely differ by geography. Generally laws in Europe are stricter than in many other regions, making regulatory risks more imminent for business (similar to climate change policies in Europe). Operational risks on the other hand can occur anywhere in the world.

- The results come from reports that were published between 2005 and 2011. Given that a growing number of companies are addressing this issue, there may be an underestimation of the level of preparedness from older reports (before 2009).

Appendix C: Basic BES Checklist[12]

Risk

Reputational risk

- Is the company sourcing from areas in, near or containing areas of known ecological sensitivity either protected by law or highlighted by key stakeholders,e.g. NGOs, as important? If not known, this remains a risk.
- Does the company have strong relationships with key stakeholders such as NGOs?

Regulatory risk

- Does the company source raw materials from regions that have laws or regulations which limit or require payments for resource use?
- Does the company require access to finance? If so, what safeguards are required by providers of finance on biodiversity and ecosystem services?

Legal liability risk

- Does the companies engage in activities related to the sourcing of genetic materials and 'access and benefit sharing'?
- Is the company aware of the implications of the EU Environmental Liability Directive?

Operational risk

- Does the company sell to a customer base that is engaged, aware and concerned about use and impact on biodiversity and ecosystem services?
- Are key company operations or suppliers located in areas which are heavily exploited and use of ecosystem services is unsustainable?
- Is this giving rise to conflict over resource use?

Systemic risk

- Is the company particularly dependent on ecosystem services such as water, natural pollinators which are likely to become scarce? If reliant on such services, are there substitutes?
- Do products or ingredients that may be impacted by shortages in such services form a significant volume or value for the business?
- Is the company dependent on a small number of customers who could impose stringent performance requirements on them?

Opportunity

Market differentiation

- Can the company differentiate its brand or product through improved environmental efficiencies?
- Is market demand increasing or declining for goods produced with efficient resource inputs?

Access to new revenue streams

- Does the legal and operating environment allow investigation into new sources of revenue, e.g. organic products, carbon credits or water rights?

Acknowledgements

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More information
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