The Economics of Ecosystems & Biodiversity

TEEB FOR BUSINESS

EXECUTIVE SUMMARY

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The Economics of Ecosystems & Biodiversity

THE ECONOMICS OF ECOSYSTEMS AND BIODIVERSITY

REPORT FOR BUSINESS

EXECUTIVE SUMMARY

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FOREWORD

Modern society's predominant focus on market-delivered components of well-being, and our almost total dependence on market prices to indicate value, means that we generally do not measure or manage economic values exchanged other than through markets. This is especially true of the public goods and services that comprise a large part of the benefits that nature provides humanity.

Society generally also ignores third-party effects of private exchanges (so-called 'externalities') unless they are actually declared illegal. TEEB has assembled much evidence that the economic invisibility of nature's flows into the economy is a significant contributor to the degradation of ecosystems and the loss of biodiversity. This in turn leads to serious human and economic costs which are being felt now, have been felt for much of the last half-century, and will be felt at an accelerating pace if we continue 'business as usual'.

There are both serious risks to business, as well as significant opportunities, associated with biodiversity loss and ecosystem degradation. There is also a need for business to quantify and value its impacts on biodiversity and ecosystems, in order to manage these risks and opportunities and enable a better future for all.

Evaluations of any kind are a powerful 'feedback mechanism' for a society which has distanced itself from the biosphere, upon which its very health and survival depends. Economic valuations, in particular, communicate the value of ecosystems and biodiversity and their largely unpriced flows of public goods and services in the language of the world's dominant economic and political model. Mainstreaming this thinking and bringing it to the attention of policy-makers, administrators, businesses and citizens is in essence the central purpose of TEEB, and this summary report on TEEB for Business is an important contribution towards that objective.

Pavan Sukhdev,
TEEB Study Leader

1. INTRODUCTION AND OVERVIEW

The Economics of Ecosystems and Biodiversity (TEEB) is a global study, initiated by the G8 and five major developing economies and focusing on 'the global economic benefit of biological diversity, the costs of the loss of biodiversity and the failure to take protective measures versus the costs of effective conservation'[1]. TEEB makes the case for integrating the economics of biodiversity and ecosystem services in decision-making.

This document summarizes a major component of TEEB aimed at the business community ('TEEB for Business' or Deliverable 3). The full report sets out the business case for biodiversity and ecosystem services (BES).

In this summary, we review some key indicators and drivers of biodiversity loss and ecosystem decline, and show how this presents both risks and opportunities to business. We examine the changing preferences of consumers for nature-friendly products and services, and offer some examples of how companies are responding; more detail is provided in Chapter 1 of the full report.

Here we summarize the links between business and biodiversity, focusing on the concept of ecosystem services. More detail on the status of and trends in biodiversity and ecosystem services, and the BES impacts and dependencies of different business sectors, is provided in Chapter 2 of the full report.

This summary and Chapter 3 of the full report describe recent initiatives to enable businesses to measure, value and report their impacts and dependencies on biodiversity and ecosystem services, and outline further work needed in this area. We identify practical tools to manage BES risks and show how companies are using these tools to deliver business value, with many more examples provided in Chapter 4 of the full report.

We highlight some emerging business models that deliver biodiversity benefits and ecosystem services on a commercial basis, and review the enabling frameworks needed to stimulate private investment and entrepreneurship to realize such opportunities, as well as obstacles. Chapter 5 of the full report explores this topic in detail, offering a wealth of concrete examples.

This summary briefly reviews how business can align their actions in relation to biodiversity and ecosystem services with wider corporate social responsibility initiatives, including community engagement and poverty reduction. This is developed further in Chapter 6 of the full report.

Finally, Chapter 7 of the full report and this summary conclude with a review of business and biodiversity initiatives and an agenda for action by business as well as other stakeholders. Our key points are summarized below (Box 1).

Box 1: Key action points for business

1. Identify the impacts and dependencies of your business on biodiversity and ecosystem services (BES)
2. Assess the business risks and opportunities associated with these impacts and dependencies
3. Develop BES information systems, set SMART 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

2. THE WORLD IS WAKING UP TO BIODIVERSITY LOSS

Evidence of global decline in biological diversity ('biodiversity') is incontrovertible. Most indicators of the state of biodiversity show declines, indicators of pressures on biodiversity show increases, and despite some local successes and responses, the rate of biodiversity loss does not appear to be slowing[2]. Other assessments of ecological decline are equally disturbing[3]. The direct drivers of biodiversity loss include habitat loss and degradation, climate change, pollution, over-exploitation and the spread of invasive species[4]. Projections of the impacts of climate change, in particular, show continuing changes in the distribution and abundance of species and habitats, resulting in increasing species extinction[5].

Public awareness of biodiversity loss is increasing, leading to changes in consumer preferences and purchasing decisions. Consumers are more concerned about the environment today than just five years ago[6]. NGO campaigns, scientific research and media attention are part of the reason for this change but businesses are also showing leadership, as indicated by the development of 'corporate social responsibility' initiatives. As a result, more and more consumers are favouring ecologically-certified goods and services (Box 2). This in turn increases pressure on business to review their value chains in order to ensure continued access to market, security of supply, and protect against reputational risk. In some cases, certification may be a requirement for market entry, while in others it may be a means to secure or increase market share[7].

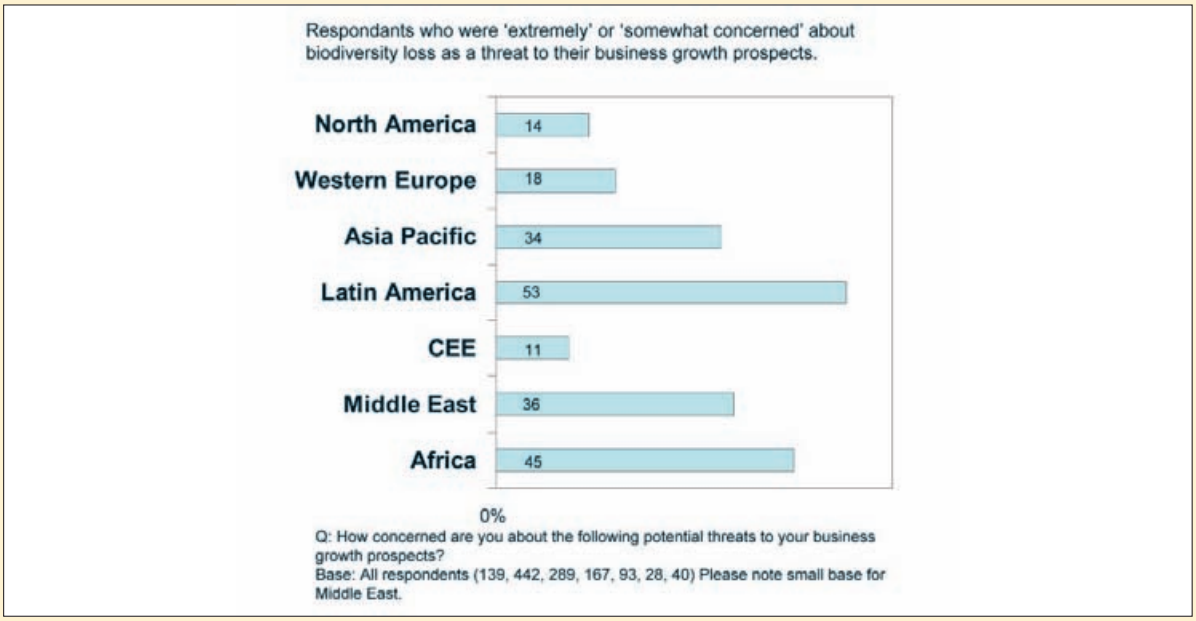
The financial services industry is starting to ask questions about biodiversity and ecosystems. Investors are exploring new opportunities linked to biodiversity and ecosystem services but they are also increasingly concerned about potential risks[13]. This is especially the case in the area of project finance and re-insurance[14]. Strategies employed include 'red-lining' investments in areas of high biodiversity, developing sector guidelines for environmentally sensitive sectors (for example, Rabobank has specific requirements regarding impacts on biodiversity for palm oil and soya), refraining from financing sectors in which a bank lacks specialist knowledge, and working with borrowers to improve their environmental performance and to mitigate harm[15].

Business is beginning to notice the threat posed by biodiversity loss[16]. 27% of global CEOs surveyed by PwC in 2009 expressed concern about the impacts of biodiversity loss on their business growth prospects[17]. Those expressing concern were more numerous in industries characterized by large direct impacts on biodiversity and in developing regions (Figure 1).

Box 2: Growth in eco-certified products and services

- Global sales of organic food and drink amounted to US$ 46 billion in 2007, a threefold increase since 1999[8].
- US organic food sales alone accounted for 3.5% of the nation's food market and increased by 15.8% in 2008, more than triple the growth rate of the food sector as a whole in the same year[9,10].
- Sales of certified 'sustainable' forest products quadrupled between 2005 and 2007[11].
- Between April 2008 and March 2009, the global market for eco-labelled fish products grew by over 50%, attaining a retail value of US$ 1.5 billion[12].
- In 2008-09, several brand owners and retailers added 'ecologically-friendly' product attributes to their major consumer brands, often through independent certification schemes, including Mars (Rainforest Alliance cocoa), Cadbury (Fairtrade cocoa), Kraft (Rainforest Alliance Kenco coffee), and Unilever (Rainforest Alliance PG Tips).

Figure 1: Views of global CEOs on the threat to business growth from biodiversity loss



Source: PricewaterhouseCoopers 13th Annual Global CEO Survey 2010

3. BIODIVERSITY PROVIDES VALUABLE ECOSYSTEM SERVICES FREE OF CHARGE

Environmentalists increasingly frame their analysis of biodiversity loss in terms of the benefits or 'ecosystem services' provided to people[18]**.** Ecosystem services enjoyed by people are economically significant and depend on both the diversity (quality) as well as the sheer amount (quantity) of genes, species and ecosystems found in nature (Table 1)[19].

Scenario projections for the period 2000-2050 suggest continued improvement in so-called 'provisioning' services (mainly food and other commodities), achieved through increased conversion of habitats and at the likely cost of further degradation in what the Millennium Ecosystem Assessment defined as 'supporting, regulating and cultural' services[20]. Continued rapid loss of biodiversity may further compromise future supplies of ecosystem services and associated economic output[21].

Biodiversity loss cannot be seen in isolation from other trends. The economic value of biodiversity and ecosystem services is a function of demand-side factors or underlying drivers of change (e.g., population growth and urbanization, economic growth, changing politics, preferences and environmental policy, developments in information and technology), as well as supply-side constraints (e.g., climate change, increasing scarcity of natural resources and/or declining quality of ecosystem services). Biodiversity loss and ecosystem decline are often closely linked to these and other major trends affecting business (see Chapter 1 in the TEEB for Business report).

Table 1: Relationship between biodiversity, ecosystems and ecosystem services		
Biodiversity	**Ecosystem goods and services (examples)**	**Economic values (examples)**
Ecosystems (variety & extent/area)	• Recreation • Water regulation • Carbon storage	Avoiding GHG emissions by conserving forests: US$ 3.7 trillion (NPV)[22]
Species (diversity & abundance)	• Food, fibre, fuel • Design inspiration • Pollination	Contribution of insect pollinators to agricultural output: ~US$ 190 billion/year[23]
Genes (variability & population)	• Medicinal discovery • Disease resistance • Adaptive capacity	25-50% of the US$ 640 billion pharmaceutical market is derived from genetic resources[24]

4. THE FIRST STEP FOR BUSINESS IS TO IDENTIFY IMPACTS AND DEPENDENCIES

Far-sighted businesses can create opportunities from the greening of investor, client and consumer preferences. Business can influence consumer choice and behaviour by providing information about the sustainability of their products, as well as how to use and dispose of them responsibly. Companies can also develop 'smarter' products and services that help clients reduce their ecological footprint. The first step is for businesses to identify the impacts and dependencies of their products and services on biodiversity and ecosystem services (see Chapter 2 in the TEEB for Business report).

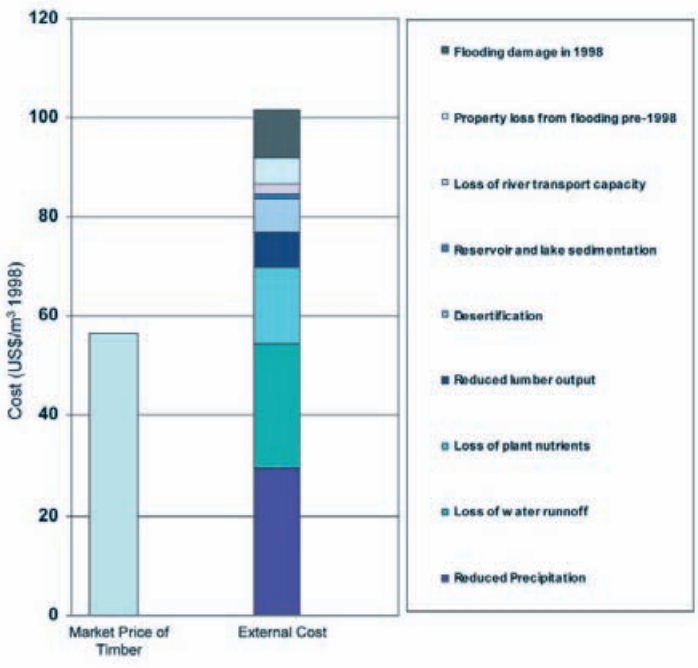
All business depend on biodiversity and ecosystem services, directly or indirectly; most businesses also have impacts on nature, positive or negative. Businesses that fail to assess their impacts and dependence on biodiversity and ecosystem services carry undefined risks and may neglect profitable opportunities (Box 3).

Box 3: Deforestation in China: Implications for the construction sector

Over the period 1949-1981 China logged some 75 million hectares, 92% of which were natural rather than plantation forests, to satisfy demand for timber for construction and other uses. The ensuing rapid deforestation resulted in the loss of ecosystem services, notably watershed protection and soil conservation. In 1997, severe droughts caused the Yellow River to dry up for 267 days, affecting industrial, agricultural and residential water users in northern China. The following year, devastating flash flooding occurred in the Yangtze and other major river basins, resulting in the loss of 4,150 lives, displacement of millions of people, and economic damages estimated at 248 billion Yuan (approximately US$ 30 billion). China's government determined that deforestation and farming on steep slopes caused these tragic events. In 1998, the government banned logging under the Natural Forest Conservation Program (NFCP). Timber harvests fell from 32 million m^3 in 1997 to 12 million m^3 in 2003, reflected in a 20-30% increase in timber prices at the Beijing wood market over the period 1998-2003.

The forest ecosystem services lost due to deforestation in China over the entire period 1950-98 were estimated to be worth as much as US$ 12 billion per year, including climate regulation, timber and fuel supply, agriculture productivity, water regulation, nutrient cycling, soil conservation and flood prevention. About 64% of this loss can be attributed to the supply of timber to the construction and materials sector. The value of forest ecosystem services lost due to timber production may be expressed in terms of the market price of timber (Figure 2). This suggests that the 'true' marginal cost of timber production in China may have been almost three times greater than the prevailing market price, far more than the modest price increase that resulted from the logging ban. Note that the logging ban resulted in increased imports of timber to China from other countries, suggesting that the environmental costs of timber consumption may have been shifted at least in part to non-Chinese forests[25].

Figure 2: Forest ecosystem services and timber prices in China



Note: The chart illustrates the economic value of forest ecosystem services that may have been lost as a result of logging to supply timber to the construction and materials sector in China over the period 1950-98, expressed in the same terms as timber prices (US$ per m3). These are rough estimates of ecosystem 'externalities' associated with logging, which are not reflected in market prices. Forest policy can be an effective means of 'internalizing' these values.

Source: Mark Trevitt (Trucost) for TEEB [26]

5. BUSINESS IS BEGINNING TO MEASURE AND REPORT IMPACTS, DEPENDENCIES AND RESPONSES

A business commitment to manage biodiversity and ecosystems begins with corporate governance and involves integration into all aspects of management. Goals and targets for biodiversity and ecosystem services can be integrated into business risk and opportunity assessment, operations and supply chain management, as well as financial accounting, audit and reporting. New and improved information systems are needed to support analysis and decision-making about BES at corporate level, site/project level, and product level, and for internal and external reporting of corporate performance (see Chapter 3 in the TEEB for Business report).

Business can frame biodiversity and ecosystem targets in various ways – the challenge is to be SMART (specific, measurable, achievable, relevant and time-bound). Business efforts in relation to biodiversity and ecosystem services often start by identifying what to avoid (e.g., 'no go' areas for exploration, prohibited technologies or sectors). Business can also express BES targets in more positive terms, such as 'reduce, reuse, recycle and restore', or adopt net balance approaches (Box 4).

Box 4: Biodiversity reporting by Rio Tinto

Rio Tinto, one of the world's largest mining companies, launched its biodiversity strategy in 2004 with a voluntary commitment to achieve 'Net Positive Impact' (NPI) on biodiversity. To fulfil this commitment, the company first aims to reduce its impacts on biodiversity through avoidance, minimisation and rehabilitation activities, and then aims for a positive impact through the use of biodiversity offsets and additional conservation actions.

As a step towards NPI, Rio Tinto has developed tools to assess the biodiversity values of its leases and other land holdings. In association with several conservation organizations, the company has also begun to apply offset methodologies in Madagascar, Australia and North America. In 2009, a methodology to develop Biodiversity Action Plans (BAPs) was completed in collaboration with Fauna & Flora International (FFI) and biodiversity consultants Hardner & Gullison.

Rio Tinto reports on the relative biodiversity value (low, moderate, high and very high) of its mining sites, the amount of land in proximity to biodiversity rich habitats and the number of plant and animal species of conservation significance within each land holding. This information is reported on the company's website.

Source: Adapted from www.riotinto.com[27]

Measurement of biodiversity and ecosystem services is improving but still challenging. Standard environmental performance indicators focus on direct inputs (e.g., water, energy or materials) and outputs (e.g., pollutant emissions, solid waste). Measurement of BES requires consideration of business impacts on all components of biodiversity (i.e., genes, species, ecosystems), as well as the dependence of business operations on intangible biological processes (e.g., natural pest and disease control, nutrient cycles, decomposition). Life cycle assessment (LCA) techniques and environmental management systems need to be expanded and refined to enable companies to assess BES along product life cycles and value chains[28]. Despite such challenges, companies can begin to measure their impacts and dependence on biodiversity and ecosystem services using available metrics and reporting tools, even as they contribute to developing the field (Chapter 3).

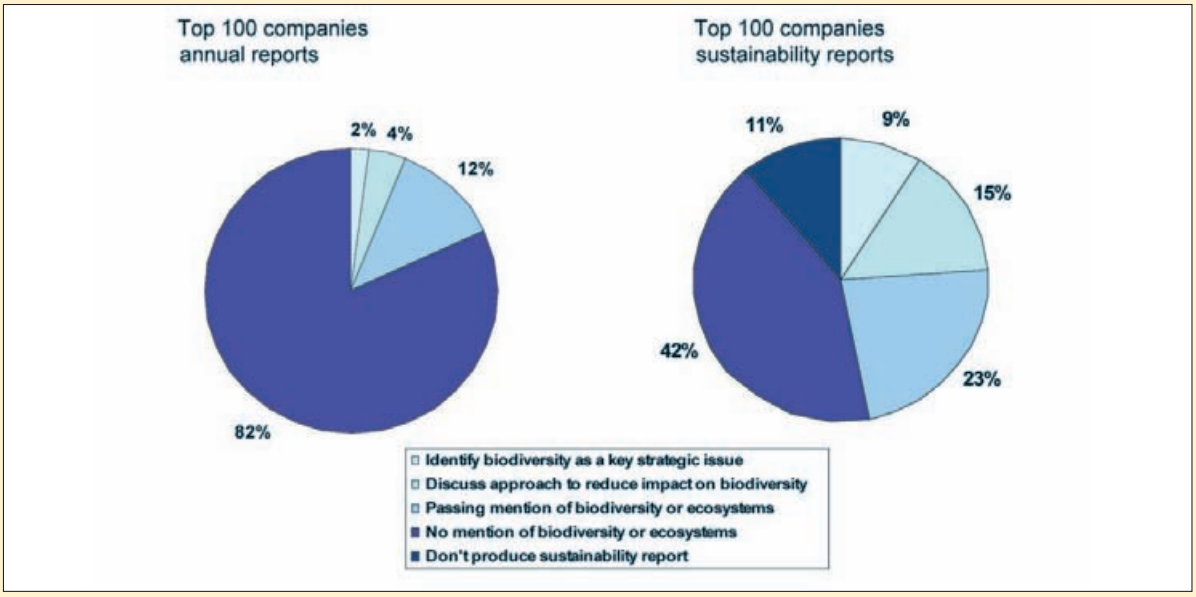
Economic valuation of biodiversity and ecosystem services can provide important information but more effort is needed to integrate this into business decision-making[29]. Reliable methods are available to determine the economic value of BES[30]. The use of these methods in, for and by business can help make the link from ecological impacts and dependence to the business bottom line. Ultimately, the ability and interest of business to use such valuations in their financial accounts may depend on developments in accounting standards, financial disclosure requirements, and environmental liability regulations (Chapter 3).

Financial regulators and accounting professionals are starting to provide guidance on how companies should report environmental issues, but more work is needed in partnership with other organizations with expertise on metrics and standards for biodiversity and for ecosystem services other than carbon[31]. Many companies report their greenhouse gas emissions and mitigation efforts[32]. In contrast, biodiversity and ecosystem services are usually treated superficially in company reports and are rarely seen as financially material or relevant to annual financial reporting (Box 5). This may be due to lack of clarity on reporting standards and the low priority assigned by reporting organizations. Lack of standard performance metrics for biodiversity and ecosystem services that can be used at company level and monitored continuously is one obstacle to improved monitoring and disclosure. The Global Reporting Initiative provides guidance and some basic indicators to start with, which can be refined to meet specific industry needs such as through GRI sector supplements[33].

Box 5: Biodiversity and ecosystem reporting across sectors

A review by PwC of the annual reports of the 100 largest companies in the world by revenue in 2008 found 18 companies that mentioned biodiversity or ecosystems[34]. Of these, 6 companies reported actions to reduce impacts on biodiversity and ecosystems and 2 companies identified biodiversity as a key 'strategic' issue. 89 of the same 100 companies published a sustainability report, 24 of which described actions to reduce impacts on biodiversity and ecosystems, while 9 companies identified impacts on biodiversity as a key 'sustainability' issue (Figure 3). Looking more closely at the sustainability reports, PwC observes that companies in sectors sometimes characterized by high impact or dependence on BES (i.e. oil and gas, utilities, chemicals, big pharmaceutical companies and food retailers) are more likely to identify biodiversity as a key strategic issue (19% versus 9% overall) and are also more likely to report actions to reduce impacts on biodiversity (36% versus 24% overall).

Figure 3: Reporting by business on biodiversity and ecosystems



Another survey conducted in 2008-9 by Fauna & Flora International, Brazilian business school FGV and the UNEP Finance Initiative showed that most companies in the food, beverage and tobacco sectors produced limited public disclosures on biodiversity, rarely stated explicit targets and relied on qualitative data (case studies, descriptions of initiatives) rather than performance based metrics[35]. Similar studies conducted by UK-based asset manager Insight Investment and focusing on extractive industries and utilities (22 companies in 2004[36] and 36 companies in 2005[37]) revealed comparable results. Information on biodiversity and ecosystem services is generally qualitative and frequently scattered throughout companies' websites.

Source: PwC for TEEB

6. BUSINESS IS FINDING NEW WAYS TO REDUCE BIODIVERSITY AND ECOSYSTEM RISKS

Public acceptance of biodiversity loss is declining, leading to calls for low-impact production and compensation for impacts on biodiversity and ecosystems[38]. Many companies are exploring how to manage the adverse impacts of their activities on BES. A few companies have made public commitments to 'No Net Loss', 'Ecological Neutrality' or even 'Net Positive Impact' on biodiversity, or on specific ecosystem services such as water resources (see Chapter 4 in the TEEB for Business report). In some cases, even relatively straight-forward ecological restoration following resource extraction can deliver biodiversity benefits that may exceed those of the original land use (Box 6).

Managing biodiversity risk involves looking beyond sites and products to the wider land and seascape. In the mining and oil and gas industries, for example, corporate environmental risk management has tended to focus on direct or primary impacts – those that result from site-level activities which could be avoided or mitigated through improved processes, procedures or technologies[40]. However, increasing public scrutiny and more stringent regulations have led companies across a range of sectors to extend their risk horizon to include indirect or secondary impacts. This is echoed by growing interest in landscape level assessment and planning tools, product life cycle analysis and supply chain management, based on environmental criteria (Chapter 4).

Effective biodiversity and ecosystem risk management may be facilitated by appropriate enabling frameworks and partnerships. These may include new markets for biodiversity-friendly products, investment screening processes that require attention to biodiversity impacts, and/or regulatory settings that pay close attention to biodiversity risks during the impact assessment process (Chapter 4). Business risk management strategies also often involve public-private partnerships and stakeholder engagement[41].

Box 6: Valuing the benefits of wetland restoration: Aggregate Industries UK

In support of a request to extend an existing quarry in North Yorkshire, Aggregate Industries UK (a subsidiary of Holcim) proposed to create a mix of wetlands for wildlife habitat as well as a lake for recreational use, following extraction of sand and gravel from land currently used for agriculture. Stakeholders were consulted to determine their preferences. Ecosystem valuation was undertaken in 2009-10 to estimate the benefits associated with wetland restoration. Using a 50 year time horizon and a 3% discount rate, the study concluded that the value of biodiversity benefits generated by the proposed wetlands (US$ 2.6 million in 2008), the recreational benefits of the lake (US$ 663,000) and increased flood storage capacity (US$ 417,000) would, after deducting restoration and opportunity costs, deliver net benefits to the local community of about US$ 2 million, in present value terms. Moreover, the marginal benefits of wetland restoration far exceeded the current benefits derived from agricultural production. The study further shows that the costs of ecosystem restoration and aftercare are low compared to both the economic benefits of wetland restoration and the financial returns from sand and gravel extraction.

Source: Olsen with Shannon (2010) [39]

7. BUSINESS CAN CONSERVE BIODIVERSITY AND DELIVER ECOSYSTEM SERVICES

Biodiversity and ecosystem services offer opportunities for all business sectors[42]. The integration of BES into business can create significant added value for companies, by ensuring the sustainability of supply chains, or by penetrating new markets and attracting new customers (Box 7). Policies and procedures to manage biodiversity and ecosystem risk can also help to identify new business opportunities, such as:

- Reducing input costs through improved efficiency;
- Developing and marketing low impact technologies;
- Managing and designing projects to reduce their footprint; and
- Professional services in risk assessment and management/adaptation[43].

Biodiversity or ecosystem services can be the basis for new businesses. Conserving biodiversity and/or using it sustainably and equitably can be the basis for unique value propositions, enabling entrepreneurs and investors to develop and scale up 'biodiversity businesses' (see Chapter 5 in the TEEB for Business report). The case for biodiversity as a business opportunity is perhaps most apparent in ecotourism, organic agriculture and sustainable forestry, where there is growing demand for 'sustainable' goods and services, as noted above. More generally, some estimates suggest that sustainability-related global business opportunities in natural resources (including energy, forestry, food and agriculture, water and metals) may be in the range of US$ 2-6 trillion by 2050 (in 2008 prices)[46]. If accurate, these projections suggest that the private sector will play an increasingly important role in natural resource management.

Tools for building biodiversity business are in place or under development. Critical market-based tools for capturing BES opportunities, such as biodiversity performance standards for investors, biodiversity-related certification, assessment and reporting schemes, and voluntary incentive measures, are available or under development and could be promoted across all business sectors and markets (Chapter 5). One key tool is the International Finance Corporation's (IFC's) Performance Standard 6 (PS6) on Biodiversity Conservation and Sustainable Natural Resource Management[47]. This not only guides the investments of the IFC - the private sector arm of the World Bank - but also influences the investments of some 60 large, multinational banks that have adopted the Equator Principles, which call for adherence to IFC Performance Standards for project financing above US$ 10 million in emerging markets[48].

Biodiversity and ecosystem service markets are emerging, alongside markets for carbon. Effective responses to biodiversity loss and the decline in ecosystem services require changes in economic incentives and markets[49]. The global carbon market grew from virtually nothing in 2004 to over US$ 140 billion in 2009, largely as a result of new regulations driven by concern about climate change[50]. New markets for biodiversity 'credits' and intangible ecosystem services such as watershed protection are also emerging, providing new environmental assets with both local and international trading opportunities (Table 2).

A first major market opportunity is likely to be reducing emissions from deforestation and degradation and related land-based carbon offset

Box 7: Walmart: Stocking sustainable products in response to consumer demand

Walmart, a large retailer, announced a new environmental strategy in 2005, involving among other things a commitment to sell 'sustainable' products[44,45]. The company uses a 'Sustainable Product Index' to assess the environmental impacts of the products it stocks and relays this information to customers using a labelling system. The Sustainable Product Index measures such facets of production as energy usage, material efficiency and human conditions.

initiatives (REDD+)[52]**.** Although designed mainly to address climate change, REDD+ is likely to deliver significant biodiversity benefits through the conservation of natural forests[53]. Another potential market opportunity is the green development mechanism (gdm), a proposed innovative financial mechanism currently under discussion in the Convention on Biological Diversity[54].

Appropriate public policies create the enabling framework for new BES business. Inspired by the rapid development of global carbon markets and experience with markets for other ecosystem services (e.g., water markets in Australia, wetland mitigation banking in the USA), policy-makers are experimenting with a range of business-oriented regulatory reforms. Experience shows that the establishment of efficient ecosystem services markets requires several conditions to be met, involving inputs from financial and market experts as well as government (Table 3). There is an opportunity for business to get involved in pilot-schemes and help design efficient enabling conditions for such markets.

Table 2: Emerging markets for biodiversity and ecosystem services

Market opportunities	Market size (US$ per annum)		
	2008	Estimated 2020	Estimated 2050
Certified agricultural products (e.g., organic, conservation grade)	$40 billion (2.5% of global food and beverage market)	$210 billion	$900 billion
Certified forest products (e.g., FSC, PEFC)	$5 billion of FSC-certified products	$15 billion	$50 billion
Bio-carbon / forest offsets (e.g., CDM, VCS, REDD+)	$21 million (2006)	$10+ billion	$10+ billion
Payments for water-related ecosystem services (government)	$5.2 billion	$6 billion	$20 billion
Payments for watershed management (voluntary)	$5 million Various pilots (Costa Rica, Ecuador)	$2 billion	$10 billion
Other payments for ecosystem services (government-supported)	$3 billion	$7 billion	$15 billion
Mandatory biodiversity offsets (e.g., US mitigation banking)	$3.4 billion	$10 billion	$20 billion
Voluntary biodiversity offsets	$17 million	$100 million	$400 million
Bio-prospecting contracts	$30 million	$100 million	$500 million
Private land trusts, conservation easements (e.g., North America, Australia)	$8 billion in U.S. alone	$20 billion	Difficult to predict

Source: Adapted from Forest Trends and the Ecosystem Marketplace (2008)[51]

Table 3: Pre-requisites for developing markets for biodiversity and ecosystem services		
Financial	**Regulatory**	**Market**
• Clearly defined BES credits and debits • Insurability of BES assets • Investor awareness and support for commercial ventures • Competitive risk/reward profile • Combined ecosystem, business development and financial expertise	• Secure use and/or property rights over ecosystem assets and services • Clear baselines in order to assess the 'additionality' of BES investments • Approved standards and methods for assessing debits and credits • Fiscal incentives (e.g., tax credits for conservation) • Legal authority to trade ecosystem credits/debits (including internationally) • Adequate regulatory capacity to enforce	• Clearly defined asset classes • Efficient project approval processes • Modest transaction costs • Widely accepted monitoring, verification and enforcement systems • Linked registries to record transactions (especially for intangibles, e.g., offsets) • Competitive intermediary services (e.g., brokers, validators)

Source: PwC for TEEB

8. SYNERGIES EXIST BETWEEN BUSINESS, BIODIVERSITY AND SOCIAL DEVELOPMENT

Economic and social development generally involves more consumption and open markets, both highly correlated with business development but also often associated with biodiversity loss and ecosystem decline. The challenge is to reinforce economic development strategies that are ecologically sustainable, socially equitable and good for business (see Chapter 6 in the TEEB for Business report).

Good governance and clear property rights are essential for business development, environmental protection and poverty reduction. Better understanding of how governance arrangements and especially property rights contribute to biodiversity loss and ecosystems degradation is essential in order to design responses that are not only ecologically sustainable but also socially acceptable. Reform of resource tenure, access rights and benefit-sharing arrangements can be a complement to successful corporate community engagement (Chapter 6).

There are potential synergies between business, conservation and poverty reduction, but these are not realized automatically. Biodiversity and ecosystem services are not routinely considered in corporate decision making related to social investment programmes (Chapter 6). As such, some companies have programmes that support biodiversity conservation and separate programmes that support local economic development. In many cases these programmes are in conflict or fail to realize potential synergies, although a few companies have found ways to combine biodiversity and ecosystems with their social programmes (Box 8).

Box 8: Business initiatives to address poverty and biodiversity together

While many companies support local charities involved in social and economic development, relatively few manage to integrate their social and environmental programmes. Some examples include training programmes, capacity building and collaboration with NGOs, local governments and local business associations, such as:

Starbucks:[55] This large coffee retailer supports the investment portfolio of Verde Ventures, an initiative of Conservation International. Verde Ventures provides loans to local NGOs and coffee farmers to help them implement projects that maintain forest ecosystems and services. One example is a loan to a coffee-growing cooperative near the Sierra Madre, which helped finance the coffee harvest while also allowing farmers to undertake reforestation activities adjacent to their lands. The funding also supported training programmes focused on environmentally friendly coffee cultivation practices, with an emphasis on female education.

British American Tobacco:[56] BAT's Social Responsibility in Tobacco Production programme promotes improved agricultural practices such as soil and water conservation; appropriate use of agrochemicals; environmental, occupational health and safety standards in tobacco processing; and afforestation to enable farmers who require wood for tobacco curing to obtain it from local sustainable sources.

Syngenta:[57] The company supports a project providing training and agricultural extension services to smallholder farmers in Kenya, combining efforts to improve crop yields and income by introducing modern agricultural techniques, conservation-oriented farming practices and improved market access. Syngenta supports similar projects with farmers in India, Mali, Brazil, and Bangladesh. The company also supports agricultural research by local universities and partnerships with local NGOs and communities.

9. BUSINESS CAN TAKE ACTION AND ACHIEVE MORE IN PARTNERSHIPS

The business case for biodiversity and ecosystems is getting stronger. This report argues that companies that understand and manage the risks presented by biodiversity loss and ecosystem decline, that establish operational models that are flexible and resilient to these pressures, and that move quickly to seize business opportunities, are more likely to thrive. Just as climate change has stimulated carbon markets and new business models, biodiversity and ecosystem services also offer opportunities for investors and entrepreneurs. However, there is a need to agree priorities and adopt an agenda for action – by business leaders, accountancy bodies, governments and other stakeholders – otherwise significant change is unlikely.

The accounting profession and financial reporting bodies should accelerate efforts, in partnership with others, to provide standards and metrics for disclosure and audit / assurance of BES impacts. Both general and sector-specific guidance is available for business on how to identify and address risks and opportunities associated with biodiversity and ecosystems. Governments, NGOs and

business, often working together, have developed various principles, guidelines, handbooks and tools to help business address BES challenges. These initiatives often acknowledge the need for better metrics, including valuation, and sometimes call for enabling policy, including market-based incentives (see Chapter 7 in the TEEB for Business report). Most existing initiatives are weak, however, at quantifying biodiversity impacts (the so-called 'externalities' of business) in terms of human welfare. Methodologies for sector and business-level quantification of biodiversity and ecosystem services values are needed, accompanied by appropriate reporting requirements. Credible audit and assurance mechanisms are also needed to validate business performance and the quality of disclosure.

Governments have an essential role to play in providing an efficient enabling and fiscal environment. This includes removing environmentally-harmful subsidies, offering tax credits or other incentives for conservation investment, establishing stronger environmental liability (e.g., performance bonds, offset requirements); developing new ecosystem property rights and trading schemes (e.g., water quality trading); encouraging increased public access to information through reporting and disclosure rules; and facilitating cross sector collaboration[58].

Starting today, business can show leadership on biodiversity and ecosystems:

1. **Identify the impacts and dependencies of your business on biodiversity and ecosystem services (BES).** The first step is to assess business impacts and dependencies on biodiversity and ecosystems, including both direct and indirect linkages throughout the value chain, using existing tools while also helping to improve them.
2. **Assess the business risks and opportunities associated with these impacts and dependencies.** Based on this assessment, companies can identify the business risks and opportunities associated with their impacts and dependencies on BES, and educate their employees, owners, suppliers and customers. Economic valuation of BES impacts and dependencies can help to clarify risks and opportunities.
3. **Develop BES information systems, set SMART targets, measure and value performance, and report your results.** Biodiversity and ecosystem strategies for business are likely to include improved corporate information system, development of quantitative BES targets and performance indicators, and their integration into wider business risk and opportunity management processes. A key step for building trust with external stakeholders, while creating peer pressure within industry, is for business to measure and report their BES impacts, actions and outcomes.
4. **Take action to avoid, minimize and mitigate BES risks, including in-kind compensation ('offsets') where feasible.** BES targets may build on the concepts of 'No Net Loss', 'Ecological Neutrality' or 'Net Positive Impact' and include support for biodiversity offsets where appropriate. Industry associations will continue to play a key role in developing and promoting robust and effective biodiversity performance standards and impact mitigation guidelines for their members.
5. **Grasp emerging BES business opportunities, such as cost-efficiencies, new products and new markets.** Business can support the growth of green markets and help design efficient enabling conditions for biodiversity and ecosystem service markets. Such opportunities may be facilitated by engaging with public agencies, accountancy and financial standard setting bodies, conservation organizations and communities.
6. **Integrate business strategy and actions on BES with wider corporate social responsibility initiatives.** There is potential to enhance both biodiversity status and human livelihoods, and help reduce global poverty, through the integration of BES in corporate sustainability and community engagement strategies.
7. **Engage with business peers and stakeholders in government, NGOs and civil society to improve BES guidance and policy.** Business can bring significant capacity to conservation efforts and has a key role to play in halting biodiversity loss. Business needs to participate more actively in public policy discussions to advocate appropriate regulatory reforms, as well as developing complementary voluntary guidelines.

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The Economics of Ecosystems and Biodiversity (TEEB) is a global study, initiated by the G8 and five major developing economies and focusing on "the global economic benefit of biological diversity, the costs of the loss of biodiversity and the failure to take protective measures versus the costs of effective conservation". TEEB makes the case for integrating the economic values of biodiversity and ecosystem services in decision-making.

This report provides a summary for the business community, illustrated with examples from a range of companies and sectors. It asks:

- What are the risks and opportunities to business of ecological change?
- What is business currently doing about biodiversity and ecosystem services?
- What more could business do? and
- How can the business imperative to deliver profits be better aligned with the conservation and sustainable use of biological resources?

The full TEEB for Business report (D3), along with companion reports and other materials for the scientific community (D0), national and international policy makers (D1), local and regional policy (D2) and citizens (D4) can be downloaded from www.teebweb.org.