

Bio-positive

Strategies for Sustainable Business Growth

Prepared by PwC for the World Economic Forum

This document is an output from the World Economic Forum's Global Agenda Council on Ecosystems and Biodiversity, prepared by PwC's Forestry and Ecosystems team, part of PwC's global Sustainability & Climate Change Practice. Contributing PwC authors were Chris Knight, Will Evison, Jim Stephenson, Tim Boothman and Quiller Brooke with valuable inputs from Josh Bishop of International Union for Conservation of Nature (IUCN), Stuart Anstee of Rio Tinto, Glenn Prickett of The Nature Conservancy, Pavan Sukhdev of The Economics of Ecosystems and Biodiversity (TEEB) and the United Nations Environment Programme (UNEP) Green Economy Initiative, Pati Ruiz Corzo of the Sierra Gorda Biosphere Reserve and Tom Watson of the World Economic Forum.

For the data, assumptions and source materials used in this publication and further information please see the bio-positive link on www.pwc.co.uk/forestry_ecosystems or contact chris.knight@uk.pwc.com.

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“It’s time we stopped considering biodiversity as expendable, and any related expenditure a write-off – it’s time we valued and conserved nature!”

Julia Marton-Lefèvre, IUCN Director General

“For many businesses, ecosystem dependencies are hidden, but leading companies are starting to assess these dependencies, helping to make the invisible visible.”

**Malcolm Preston, Global Leader,
Sustainability and Climate Change, PwC**

“This document highlights some companies which are taking action to re-engineer their value chains to take account of ecosystem services, a trend which will only become more important in this resource constrained world.”

**Tom Watson, Global Agenda Council Manager for Ecosystems
and Biodiversity, World Economic Forum USA**



Diversity and quantity of genes, species and ecosystems (biodiversity) underpins the earth's vital "ecosystem services" such as freshwater provision and climate regulation.

We are reliant on these services for company success and economic growth, yet only recently have we begun to appreciate the magnitude of the economic dependency which exists.

63%

of ecosystem services degraded¹



US\$ 4.5
trillion
value lost
every year²

Extinctions at

100+

times the
natural level³

**Despite the alarming statistics,
there are reasons to be positive
about business and biodiversity.**

Why “bio-positive”?

We believe that with strategic foresight, it **IS** possible to reconcile sustained business growth with the maintenance or enhancement of ecosystem services.

The UN International Year of Biodiversity was 2010. Strong global actions to address biodiversity loss are now public and private sector priorities.

In Nagoya, November 2010, the 193 parties to the Convention on Biological Diversity agreed a new strategic plan to address biodiversity loss which will accelerate the development of national regulation and increase demands on companies.

This briefing outlines what biodiversity loss, and measures to halt this loss, could mean for companies in five major industry sectors, first in terms of risk, but also in terms of opportunities. We also highlight the type of strategic decisions which some of the world’s leading corporations are now making to become resilient to these risks and realize opportunities.

Agriculture & Forestry

Risk

The value at stake from biodiversity loss and ecosystem degradation in agricultural supply chains is enormous.

- 70% of the world's most productive crops are animal-pollinated.⁴
- Around 1.5 billion hectares of cropland has been abandoned in the past 40 years due to soil erosion⁵ with annual EU losses of 1.7 billion euros in lost output and knock-on impacts.⁶
- The mountain pine beetle infestation in British Columbia, Canada is predicted to kill up to one billion cubic metres of standing lodgepole pine in the province. Resulting reductions in lumber production will contribute to a possible 50% reduction in Canada's market share of US softwood lumber consumption.⁷
- Mismanaged or accidental introductions of agricultural pests cause estimated losses of US\$ 100 billion annually.⁸

“Biodiversity is the foundation of our business.”

Juan Gonzalez-Valero, Head of Corporate Responsibility, Syngenta



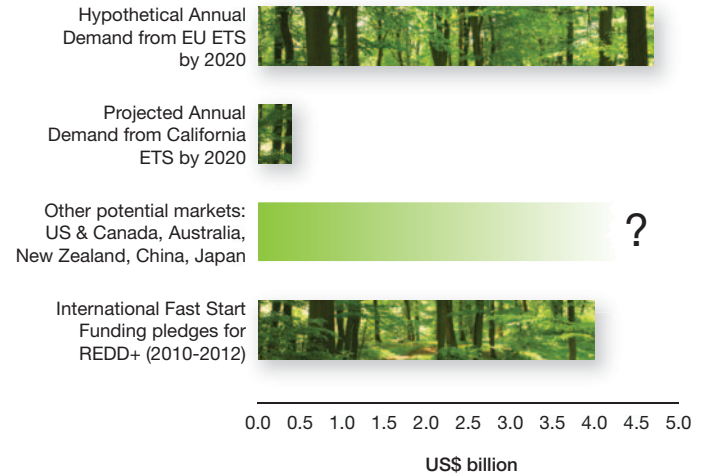
Some companies are responding to the risks. For example, Unilever's Sustainable Living Plan reports: “Today we source 10% of our agricultural raw materials sustainably. By 2012 we will source 30%; by 2015 50%; and by 2020 100%.”⁹

Opportunity

The agriculture and forestry sectors may also see significant ecosystem-service-related opportunities.

- Reducing emissions from deforestation and forest degradation (REDD+) is a proposed international mechanism to provide incentives to keep forests standing. It will also have applications in agriculture.
- The Eliasch Review¹⁰ on financing global forests estimates that by 2030 US\$ 17 to 33 billion per annum would be needed to reduce deforestation by half.
- By 2020, the EU Emissions Trading Scheme (ETS) and the Californian ETS could provide US\$ 5 billion per year and other markets may yet emerge to fill the gap (Figure 1).
- Donors have already pledged US\$ 4 billion in “fast-start” funding for REDD+.¹¹

Figure 1: Potential Funding for REDD+¹²



These numbers reflect the role that forests play in terms of carbon storage. With the inclusion of other ecosystem services, the financial flows to help conserve forests are only likely to increase.

Construction and Real Estate

Risk

Construction sector value chains are heavily reliant on natural resources which are impacted by ecosystem decline and carry significant price volatility.

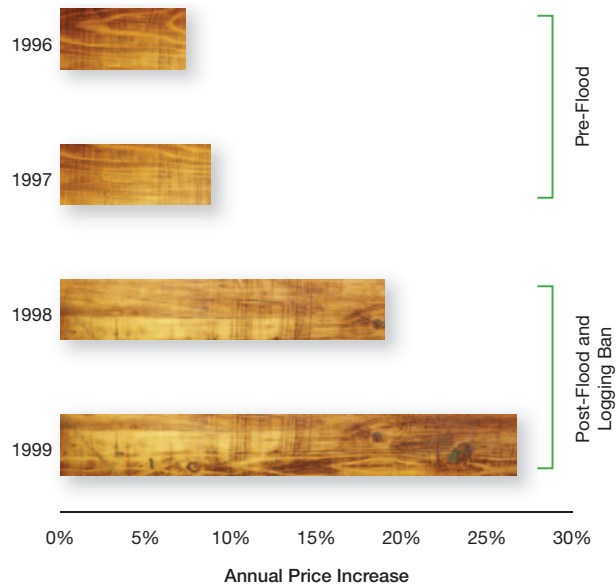
- Floods in China in 1998 caused by extensive deforestation helped to bring about a government imposed logging ban.¹⁴
- Resulting timber shortages led to a 50% increase in price over the following two years (Figure 2).
- The Chinese construction and materials sector which was then absorbing 64% of China's timber faced steep cost increases and was forced to seek alternative supplies.¹⁵

Companies increasingly need to demonstrate sustainable sourcing practices or risk losing contracts as changes to procurement policy demand. For example, following updates to the UK government's timber procurement policy, Travis Perkins (a UK building materials supplier) obtained FSC Chain of Custody certification, helping it to retain an estimated 60 million British pounds in government contracts.¹⁷

“Between 16% and 19% of the timber imports into the EU derive from illegal or suspicious sources.”¹³

WWF

Figure 2: Annual Price Increase for Timber Products in China¹⁶



Opportunity

Habitat banking, a concept similar to carbon offsetting, presents significant opportunities for real estate companies and associated enterprises.

- On the buy-side; the potential introduction of habitat banking into Europe could help to speed up the planning and approval process if companies engage with habitat banking markets to improve biodiversity outcomes.
- On the sell-side; land management companies with the skills required to restore ecosystems could capture a market that to date has been worth US \$1.1-1.8 billion in the United States alone. Latin America for example has been tipped to become a “new biodiversity super power”.¹⁸

Vulcan Materials Corporation acquired 130 acres of land in California, which was later discovered to be home to the endangered Delhi Sands flower-loving fly. As an alternative to the planned aggregate extraction, the company obtained the right to sell “fly habitat credits” which are estimated to have been sold for between US\$ 100,000 to US\$ 150,000 per acre to developers¹⁹



Shasta Big Spring Ranch, California. An important spawning area for Coho salmon which will be preserved through Walmart's Acres for America program.

Through their Acres for America program, Walmart “...is committed to permanently conserve at least one acre of priority wildlife habitat for every developed acre.”²⁰

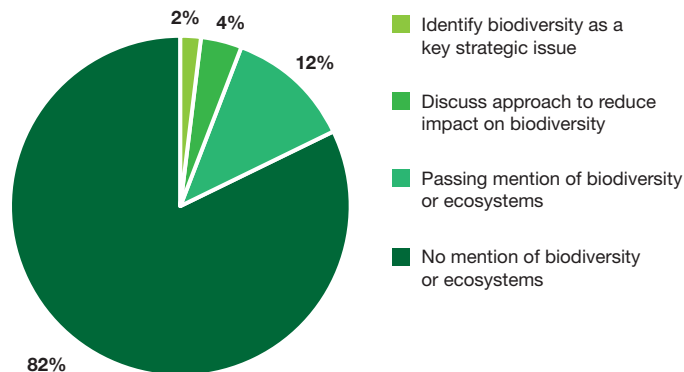
Financial Services

Risk

Biodiversity loss and ecosystem degradation present significant risks to companies which are not currently visible to their financiers.

- Equator Principles banks have agreed to apply the International Finance Corporation (IFC) Performance Standards, including conservation of biodiversity, to the projects that they finance. Together these 68 banks account for 90% of project financing.²¹
- Many banks have also put in place biodiversity policies that apply to other forms of lending, such as corporate loans, trade finance and asset management. Despite this, knowledge of biodiversity risks and mitigants remains low across the financial services sector.²²
- Around 850 of the companies listed on the FTSE All-World Development index whose activities have a significant impact on biodiversity have no policy to manage their risks.²³
- Company disclosure does not help banks assess these risks. Of the largest 100 companies in the world, 82% make no mention of biodiversity or ecosystems in their annual reports (Figure 3).

Figure 3: Biodiversity in the Annual Reports of the 100 Largest Companies in the World²⁴



“The loss of natural capital (including ecosystems, biodiversity and natural resources) has direct and widespread negative effects on financial performance.”

Colin Mervin, Chief Executive Officer, Hermes Equity Ownership Services

Opportunity

Financial institutions have much to gain from the projected growth in biodiversity related markets.

- The growth in sustainable forestry, agriculture and other biodiversity related assets represents a rapidly emerging client segment for financial institutions.
- Equity investment, debt finance, fund structuring and fund management all present opportunities, as do products and services that will finance the creation of sustainable land-based commodities, for example structured trade finance for palm oil, soy, cotton and cocoa.
- Banks will also play a central role in building biodiversity and ecosystems markets such as the nascent market for forest carbon credits.

- Some of these biodiversity and ecosystem related markets have already achieved significant scale (Table 1).

Table 1: Biodiversity-related Markets²⁵

BES asset class	Market Value (2008)
Biodiversity mitigation/offsets	US\$ 1.8-2.9 billion
Certified agricultural products, including non-timber forest products (NTFPs)	US\$ 40 billion
Certified forest products (FSC, PEFC)	US\$ 5 billion
Payments for water-related ecosystem services (government)	US\$ 5.2 billion
Private land trusts, conservation easements (e.g. North America, Australia)	US\$ 8 billion

In August 2010 The Sumitomo Trust²⁶ launched a new “Biodiversity Fund” with a target for assets under management of US\$ 60 million invested in companies that engage in biodiversity and sustainable development, focusing on:

1. Companies with technologies that reduce the negative impacts on biodiversity
2. Companies with technologies that can secure biodiversity



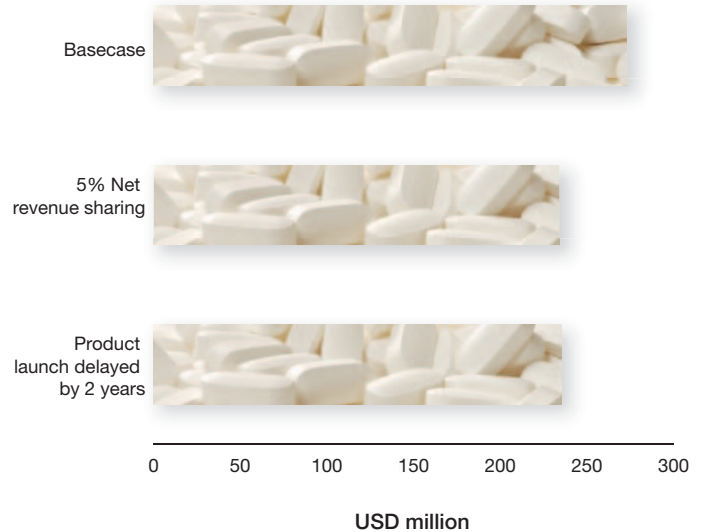
Pharmaceuticals & personal care

Risk

New rules on Access and Benefit Sharing (ABS) may initially increase costs and delays and will require companies to agree ABS contracts before they can extract native genetic resources.

- 44% of applications for genetic resource access in Colombia between 2002 and 2007 were denied due to unsatisfactory ABS arrangements.²⁷
- An illustrative analysis of a pharmaceutical project with average annual sales of US\$ 390 million, requiring US\$ 490 million of R&D is shown in Figure 3.
- In this hypothetical case, either potential ABS-related impact (revenue sharing or project delay) could reduce Net Present Value (NPV) by around 15% if ABS arrangements are not carefully managed.

Figure 4: Hypothetical Impact of Revenue Sharing and Project Delays on NPV of a Pharmaceutical Project²⁸



Opportunity

Huge potential remains to exploit genetic resources and the new ABS deal may release latent bio-prospecting demand by providing a clear framework for operators.

- Between 1981 and 2006, almost half of all cancer drugs were derived directly from natural products.²⁹
- At current rates of plant and animal extinction, we may be losing the potential to create one major drug every two years.³⁰ ABS revenues should provide incentives to protect genetic resources and help to reduce this loss.
- Although the industry has moved away from reliance on natural product discovery in recent years, it nonetheless continues to play a part in drug development and manufacturing.

“The benefits from genetic resources from nature... could be worth billions of dollars in new funds.”

Reuters, 29 October 2010³²

Coartem, a leading malaria treatment, is the result of a Chinese invention which was further developed and commercialized by Novartis, a Swiss healthcare multinational. Coartem is now patented in over 50 countries, in most of which, Novartis and its Chinese partners co-own the patent. ABS (access and benefit sharing) was pivotal to this success. Access to the active components (found in the *Artemisia annua* plant, native to South-East Asia) was guaranteed by the Chinese Government in the 1990s in exchange for technology transfer, payments for sourcing of raw materials and additional payments including royalties. Over the past decade, Novartis has supplied over 380 million Coartem treatments without profit to malaria endemic countries, saving an estimated 950,000 lives.³¹

Mining

Risk

Ecosystem degradation can lead to water scarcity which is a serious concern for many mining operations.

- Water scarcity can limit production, increase costs, lead to stricter regulation, and result in a suspension or withdrawal of abstraction licences.
- More than 45% of the world's mining operations are located in regions of high or extreme water stress.³³

It requires an average of 716 m³ of water to produce a tonne of gold. Desalination is an option to provide reliable water supply in areas of shortage. A desalination plant can cost anything from US\$ 100 million to as much as US\$ 3.5 billion, with operating costs of US\$ 2 per m³ of production.³⁴ For gold production this would mean operating costs for water of US\$ 1,400 per tonne of gold before considering capital costs.

“Water shortages are preventing the expansion of production in many of the world’s mining areas... imposing ever greater costs on [existing] mining operations.”

Bernd Zehentbauer, Senior Vice-President of Mining Technologies at Siemens VAI

Opportunity

Improved land management (including proactive water management) can increase operational security, reduce costs and help maintain a licence to operate.

In Madagascar, Rio Tinto has launched a strategic project to protect biodiversity and ecosystem services in forests around its iron oxide mining operation. The local communities are engaged to maintain the forest environment, such that the company can reduce its exposure to biodiversity and ecosystem (water supply services) risks, as well as regulatory and reputational risks. Rio Tinto is also striving for a positive impact on biodiversity in all its areas of operation through its Net Positive Impact policy, involving biodiversity offsets and impact reduction activities.³⁵



Are you “bio-positive”?

Biodiversity positive companies understand their relationship with nature and how this presents both opportunities and risks for business growth.

The link between ecosystem health and the business bottom line is not always obvious.

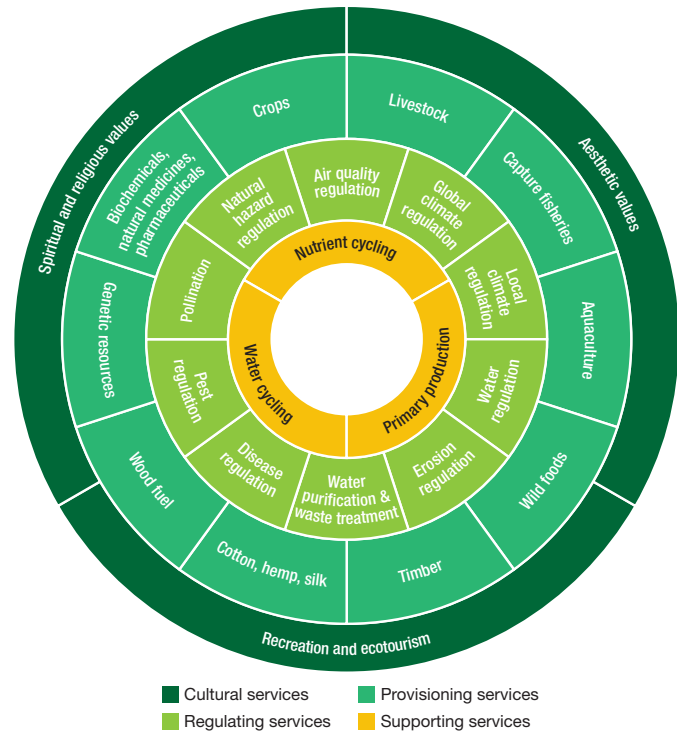
Impacts: Adverse impacts on ecosystems and biodiversity can damage companies’ reputations, leading to boycotts, legal claims, delays or regulatory action, with dramatic impacts on operating costs and profits.

Dependence: Companies depend on biodiversity and ecosystem services for key inputs to production or assimilation of waste. Increasing scarcity and declining quality of natural resources can have significant financial consequences. Environmental management systems and due diligence processes often ignore ecosystem dependencies.

What are “ecosystem services”?

Ecosystem services are benefits provided by nature, often free of charge, which all businesses depend on to some degree.

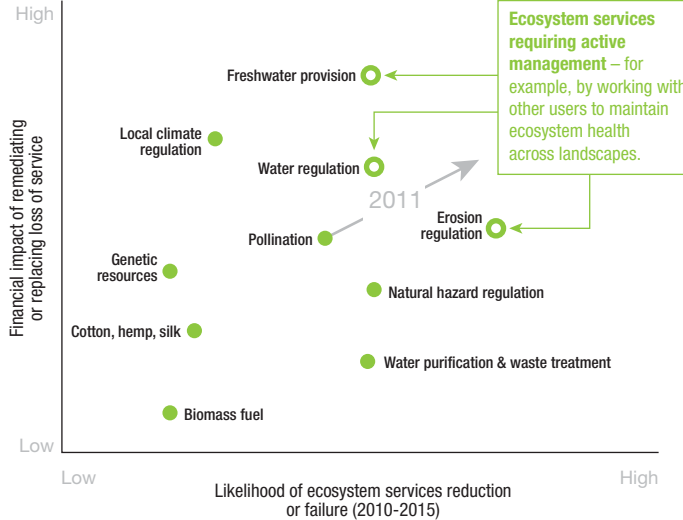
Figure 5: Ecosystem Services³⁶



Ecosystems and their services are often degraded because they do not deliver sufficient economic value to their immediate owners. For example, forest lands which regulate downstream water flow may be more economically productive for local communities as farmland. If companies can protect ecosystems in partnership with local communities – and share some of the benefits – these essential services are more likely to be protected.

Figure 6: Prioritizing Ecosystem Service Dependencies in a Hypothetical Agricultural Supply Chain

Financial impacts
– can be very high for businesses that rely on key ecosystem inputs to their products or processes (e.g. insect pollination of commercial crops, water supply to manufacturing facilities).



Reducing risk of failure – a company may secure ecosystem services at a local or landscape level, for example by investing in forest restoration in upstream watersheds. This may be a low-cost means of ensuring fresh water supplies, compared to investing in water treatment facilities.

How can your business become “bio-positive”?

- Identify and value ecosystem services on which you depend, assessing the likelihood of ecosystem decline and resilience to this.
- Measure and report your direct and indirect impacts on biodiversity and ecosystems, across the value chain.
- Set long-term goals of ecological neutrality or “zero impact” (e.g. Sony), or Net Positive Impact on biodiversity (e.g. Rio Tinto).
- Increase biodiversity on company-controlled areas and work with business peers and stakeholders in government, NGOs and civil society to maintain or enhance ecosystem health on broader scales

“The loss of biodiversity impacts our raw material supply chain. We’re highly dependent upon the earth and its ability to produce the natural resources we use to make food.”
Steve Yucknut, Vice President, Sustainability, Kraft Foods

Sony aims to be environmentally neutral by 2050, an objective which includes assessment of the impact of resource procurement and facility construction on biodiversity, and promotion of biodiversity programs such as groundwater cultivation.³⁷

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