



Biodiversity

Theme Report - 2nd in a series



This Eurosif sector report has been compiled in cooperation with oekom research. It describes the major environmental, social and governance (ESG) challenges currently facing industries cross-linked with biodiversity and ecosystem services.

OVERVIEW OF BIODIVERSITY & ECOSYSTEM SERVICES (BES)

- Biodiversity is the term used to describe the **diversity of species on earth, the diversity within species and the diversity of ecosystems**. Under the 2010 Biodiversity Indicators Partnership, a series of measurable direct and indirect indicators of biodiversity trends has been compiled, such as the density and distribution of species, sizes of forest cover and of protected areas such as nature reserves.¹
- To date, approximately **two million species** have been identified. On this basis, the Millennium Ecosystem Assessment extrapolates a figure of 13.6 million for the total number of species on earth.² According to estimates by WWF, the number of existing species fell by **30% between 1970 and 2005**.³
- The Intergovernmental Panel on Climate Change (IPCC) forecasts that if the average global temperature increases by more than 2.5°C, 20-30% of animal and plant species will face extinction.⁴ According to the Global Environment Outlook, **more than 60% of all ecosystems worldwide are damaged**.⁵ A status overview of terrestrial ecoregions can be found in Figure 1 (back page).
- Under the **Convention on Biological Diversity (CBD, 1993)**, 190 states (including the EU) have pledged themselves to species protection.⁶ The Convention focuses on three areas of action: 1) the preservation of the diversity of animal and plant species, habitats and genetic diversity, 2) the sustainable use of natural resources and 3) the fair and equitable sharing of the profits and benefits arising from them.
- In April 2002, the signatories to the CBD committed themselves to the **"2010 Biodiversity Target"** of achieving "a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation". A similar aim was also formulated in the UN Millennium Development Goals.⁷

THE BUSINESS CASE OF BIODIVERSITY & ECOSYSTEM SERVICES

- Business activity in many sectors is **based on the availability of natural raw materials and services** (Table 1). For example, the economic value of the pollination of cultivated plants by bees is estimated at €29 to €74 billion per annum worldwide.⁸ In the pharmaceutical industry, the market value of the annual global trade in medicinal plants is estimated at around €48 billion.⁹
- In contrast to other goods and services, **the market price of many ecosystem services**, particularly in the area of regulatory services, is still, as yet **unknown**. To date, only in isolated cases has it been possible to quantify the value of the services provided to companies by the natural environment. In an interim report of the world's largest ongoing study of this topic "The Economics of Ecosystems and Biodiversity" (TEEB)¹⁰, the authors put the value of services provided by nature in protected areas alone at **€3.7 trillion per annum**. The final report is due to be presented in 2010.
- The impacts of the continual extinction of species and the reduced capacity of ecosystems to function properly, as well as the political, social and market responses to them, are highly significant for companies. It is possible to distinguish two categories of companies, each non-exclusive of the other :
 - **Companies which depend on biodiversity and ecosystem services.** For these, the paramount question is whether the natural services they require will still be available in the future, and if so, to what extent, under what conditions and at what price.
 - **Companies whose activities have an impact on biodiversity and ecosystems** (e.g. through emissions into air and water or through land use). For these, to what extent action to protect species and ecosystems will affect their activities is particularly relevant.

Table 1: Ecosystem services

Raw materials	Including food, biomass & biofuels, drinking water, genetic resources, biochemicals and pharmaceutical raw materials
Regulatory services	Including services relating to water, soil, sediment and air quality, climate protection, soil & coast erosion and flood protection
Cultural value	Including amenity, aesthetic value of nature, outdoor recreation & tourism, mental & physical health and wellbeing, national traditions

Source: oekom research

¹www.twentyten.net.

²www.millenniumassessment.org.

³www.wwf.org.

⁴www.ipcc.ch.

⁵United Nations Environment Programme (UNEP), 2007 www.unep.org/geo.

⁶www.cbd.int.

⁷www.un.org/millenniumgoals.

⁸www.bund-naturschutz.de.

⁹www.bund-naturschutz.de.



BUSINESS RISKS AND OPPORTUNITIES FOR INDUSTRIES CROSS-LINKED WITH BES

General Risk Categories

Biodiversity is a critical issue for many sectors. Their dependency and impact on biodiversity and ecosystem services are both potential sources of direct and indirect business risks, which can be subdivided into six categories (Table 2, page 5).

The following industries with high levels of exposure to the above risks are examined below: agriculture & food, extractive industries, paper & forestry, real estate & infrastructure and tourism. At the same time, new business opportunities in the areas of BES are also emerging for those sectors.

Agriculture & Food	Impact on BES:	High	Dependence on BES:	High
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Impact & Dependence

- According to the aforementioned Global Environment Outlook and the TEEB study, the **intensification of agriculture** is one of the major causes of damage to ecosystems and biodiversity.¹¹
- **Impact on water:** 70% of available freshwater resources are used for irrigating fields, where large quantities of fertilisers and pesticides pollute groundwater and drinking water.¹²
- **Impact on soil:** large-scale farming, monocultures and cumulative small scale agriculture businesses deplete soil biodiversity and may lead to erosion, salinisation or desertification.
- Further impacts relate to the **conversion of natural areas** into agricultural areas and the **introduction of invasive species** which disrupt the natural equilibrium at the local level.
- The recent expansion of **biomass cultivation for the production of energy crops** has exacerbated conversion rates in some locations (e.g. Indonesian rainforest), compounding the risks and impacts described above.

- Companies which are known for their non-sustainable catching or production methods face the threat of being de-listed by supermarkets and boycotted by end consumers.

Actions and Opportunities

- Companies which commit to a sustainable management of land, water and raw materials will secure for themselves the resources they need and safeguard their access to trade and consumers. Examples of initiatives aimed at protecting biodiversity and using resources sustainably are the **Marine Stewardship Council (MSC)**¹³ and the **Roundtable on Sustainable Palm Oil**.¹⁴
- **Demand for organic food** has risen significantly in recent years. Especially the growing LOHAS (Lifestyles of Health and Sustainability) market segment attaches importance to a healthy diet based on food produced according to strict environmental criteria.

Risk

- Less clean water for the globally expanding irrigation sector and for food production may result in **conflicts over water**.
- **Reduced bioavailability of nutrients** due to the absence of soil micro-organisms.
- Restrictions on the cultivation of new arable areas and tightening of limits on the use of insecticides and herbicides.
- Potential **disruptions to the supply chain** in the food industry (e.g. over-exploitation of fisheries).
- The global scarcity of bees may also impact the food supply. If their pollination activity ceases, **alternative pollination methods** will have to be sought, which will entail significantly **higher costs**.



¹⁰www.unep.ch/etb/publications/TEEB/TEEB_interim_report.pdf.

¹¹www.unep.org/geo.

¹²UN World Water Development Report 2009: Water in a Changing World.

¹³www.msc.org.

¹⁴www.rspo.org.



Extractive Industries	Impact on BES:	High	Dependence on BES:	Low
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Impact & Dependence

Extractive activities involve large-scale impacts on the natural environment, including:

- The opening up of often pristine environments with transport infrastructure and production. Exploration for new oil and gas reserves is increasingly taking place in sensitive natural habitats (e.g. in rainforests, protected maritime areas and the Arctic).
- Large-scale clearing of forests due to open-cast mining requiring large areas of land. Air pollution from greenhouse gases, dust and sulphur dioxide; disposal of waste and processing of toxic residues (e.g. cyanide compounds, acids, heavy metals).
- Risks during the transportation of oil and gas both via pipelines (leaks) and by ship.

Risks

The extractive industry is particularly confronted by regulatory risks such as:

- Bans or strict requirements relating to oil production or mining in sensitive natural habitats.

- Stricter requirements relating to the transportation of oil, particularly by ship.
- Stricter requirements relating to the rectification of environmental damage at production sites, and the restoration of sites after the termination of production.
- Requirements relating to the establishment of compensatory areas / offsets.

Actions and Opportunities

- Creation of a framework for managing biodiversity issues (e.g. designated responsibilities within the company, integration of biodiversity assessment within environmental assessment or environmental management systems).
- Strategies to minimise the impact on biodiversity of planned projects (planning for mitigation of and compensation for adverse impacts, alternative development studies for extractive projects within known biological "hot spots", defining 'no-go' zones for projects).

Paper & Forestry	Impact on BES:	High	Dependence on BES:	High
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Impact & Dependence

According to some scientists, 80% or more of the world's terrestrial species are found in natural tropical forests. The most significant impacts of the timber industry on biodiversity and ecosystems include:

- The illegal and non-sustainable felling of forests,¹⁵ and over-exploitation of timber.
- Large-scale damage to soils and the hydrological balance as a result of clearances.
- Although large scale plantations may be an important means to protect the remaining natural forest, some large monocultural tree plantations might threaten biodiversity as they do not provide adequate habitats for other species. Tree plantations can also consume large amounts of water, which lowers groundwater levels and thus also affects the flora and fauna of surrounding areas. In addition, they can have important social impacts.

Risks

A bad reputation can have a negative impact on sales. Due to massive protests and campaigns led by NGOs, customers are

increasingly looking at whether the timber for their furniture or their paper comes from a sustainably managed source. Furthermore access to capital and insurance will become more difficult for companies which are known for their non-sustainable cultivation and felling methods.

Actions and Opportunities

Management of forests in accordance with the principles of sustainability is progressively gaining importance. Best practices include:

- Policies regarding the sustainable cultivation and supply of trees, including no procurement of wood from illegal sources; sustainable cultivation of plantations and forests managed by the company or its suppliers.
- Measures implemented to reduce the environmental impact of cultivating and logging operations, including forestry management plans, implementation of traceability systems and biodiversity action plans.
- The certification of forests as complying with commonly recognised standards such as the Forest Stewardship Council (FSC)¹⁶ or equivalent. Such certification is increasingly becoming an important requirement for access to markets in Europe and North America.

¹⁵ <http://www.wri.org>

¹⁶ www.fsc.org.

¹⁷ In this context, the UK property company British Land, for example, notes: "By enhancing local ecosystems our properties are more attractive places to work, live in and visit, and are thus more attractive to occupiers."



Real Estate & Infrastructure	Impact on BES:	High	Dependence on BES:	Medium
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Impact & Dependence

According to the TEEB study, urban sprawl and the expansion of infrastructure (roads, railways, shipping routes) constitute, alongside climate change and agriculture, a third major threat to biodiversity. The **reduced infiltration of water** due to asphalt or buildings and the **fragmentation of landscapes** cause massive damage to plant and animal habitats and interfere with the hydrological cycle.

The value of properties is affected by the natural environment. An intact natural environment enhances the attractiveness of locations and consequently their value.¹⁷

Risks

At the political level, there are **initiatives to reduce land consumption** and the environmental effects resulting from it. For example, Germany's "national sustainability strategy" sets a target of cutting growth in the amount of land used for settlement and transport to 30 hectares per day by 2020 (currently at over 115 hectares per day).¹⁸ This planned reduction could lead to restrictions

on the designation of new areas for building, requirements to make greater use of previously built-on areas ("brown fields") and greater demands to create compensatory areas, therefore impacting the activities of companies and entailing higher costs for them.

Actions and Opportunities

- Setting up programmes (**management systems, training** etc.) to promote provision for biodiversity at each stage of the property lifecycle.
- Identifying important habitats or areas supporting key species and incorporating methods for their protection into the design (e.g. creating **wildlife corridors**).
- Implementing design measures to **minimise, mitigate or compensate** for significant impacts on ecological resources.
- Providing for **urban revitalisation** (brownfield development vs. greenfield sites).

Tourism	Impact on BES:	High	Dependence on BES:	High
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Impact & Dependence

Tourist facilities, such as hotel complexes, and the infrastructure associated with them, which includes roads, airports and golf courses, can cause direct harm to plant and animal habitats. Further impacts stem from the use of water resources, from sewage and waste and from intrusions into animals habitat (e.g. diving on reefs or using turtle nesting beaches for tourism purposes).

Risks

- The appeal of travel destinations is in many cases heavily dependent on the pristine natural environment and the availability of clean water, clean air and other natural features. **Disturbance of the natural environment makes travel destinations less attractive**, which can lead to reduced bookings and sales at these locations.
- The question of whether or not a hotel is managed in an environmentally sustainable way is of growing importance for **customers** when selecting a tour operator and hotel.

Actions and Opportunities

- Adoption of standards from major international conventions and treaties on biodiversity.

- Implementation of **environmental objectives** relating to biodiversity & ecosystems.
- **Education** of staff and customers on biodiversity & ecosystem issues.
- **"Soft tourism" or "eco-tourism"** has enjoyed growing popularity in recent years.¹⁹ Specialist travel operators started servicing this segment of the market a number of years ago, and the concept is now gaining in importance among the large travel operators.



¹⁸www.rspo.org.

¹⁹The "International Ecotourism Society (TIES)" defines eco-tourism as "responsible travel to natural areas that conserves the environment and improves the well-being of local people". www.ecotourism.org.



Table 2: Direct and indirect business risks as a result of species loss and the restricted capacity of ecosystems to function properly

Risk category	Example
Physical risks	<ul style="list-style-type: none"> • Availability of plant and animal commodities • Availability of resources (e.g. clean water and air) • Decline in the aesthetic value of nature
Regulatory risks	<ul style="list-style-type: none"> • Restrictions and quotas on the harvesting of animal commodities • Restrictions on the use of environmental resources (e.g. tightening of emissions limits) • Limitations on access to land
Market-price risks	<ul style="list-style-type: none"> • Increase in prices of plant and animal commodities • Increase in prices of water and other ecosystem services • Limitations on access to capital and insurance
Market risks	<ul style="list-style-type: none"> • Change in purchasing behaviour as a result of increased observance of species conservation criteria by consumers and public procurement agencies
Legal risks	<ul style="list-style-type: none"> • Legal actions relating to the involvement of industries and/or companies in species loss • Environmental damage liability (e.g. EU Liability Directive)
Reputational risks	<ul style="list-style-type: none"> • Stigmatisation of industries and/or individual companies because of their negative impact on species diversity and ecosystems

Source: oekom research

RELEVANCE FOR THE FINANCIAL SERVICES SECTOR

Risks

Risks and opportunities arising for individual sectors and companies are of important relevance to financing, investment and insurance activity. Understanding them is essential for managing these proactively. At the same time, new business opportunities are emerging for the finance sector in the areas of biodiversity and ecosystem services.

The impacts include **reputational risks associated with the financing of controversial projects** which pose a threat to biodiversity and ecosystems (e.g. large infrastructure projects).

At the same time, companies and projects which fail to comply with the growing demands to protect species and ecosystems, and as a result may lose markets or be held liable for damages, **may default on loans, fail to realise growth and equity valuation.**

Actions and Opportunities

- Recognising international standards such as the **Equator Principles**. These require, for example, that social and environmental assessment documentation for projects being financed give details of measures for the protection and conservation of biodiversity.
- **Drawing up company policies** regarding the financing of activities and/or companies which cause harm to biodiversity and ecosystems.

- Assess client capacity and commitment to manage biodiversity risks as part of their environmental and social management system.

- Carrying out **comprehensive risk analyses** with regard to biodiversity and ecosystems.

Market opportunities are opening up for the financial sector, as illustrated by the UNEP Finance Initiative in the study "Bloom or Bust".²⁰ These include, in particular,

- Opportunities for **new financial products**, especially in the context of forestry-linked carbon credits and carbon management.

- **New banking services** connected with the mitigation of impacts on biodiversity (e.g. wetland banks).

- For the insurance sector, the EU Environmental Liability Directive (polluter pays principle) led to the **inclusion of biodiversity damages cover in some insurance policies.**²¹

- **Reputation management and branding**, for example through targeted sponsorship projects linked to species and environmental protection.

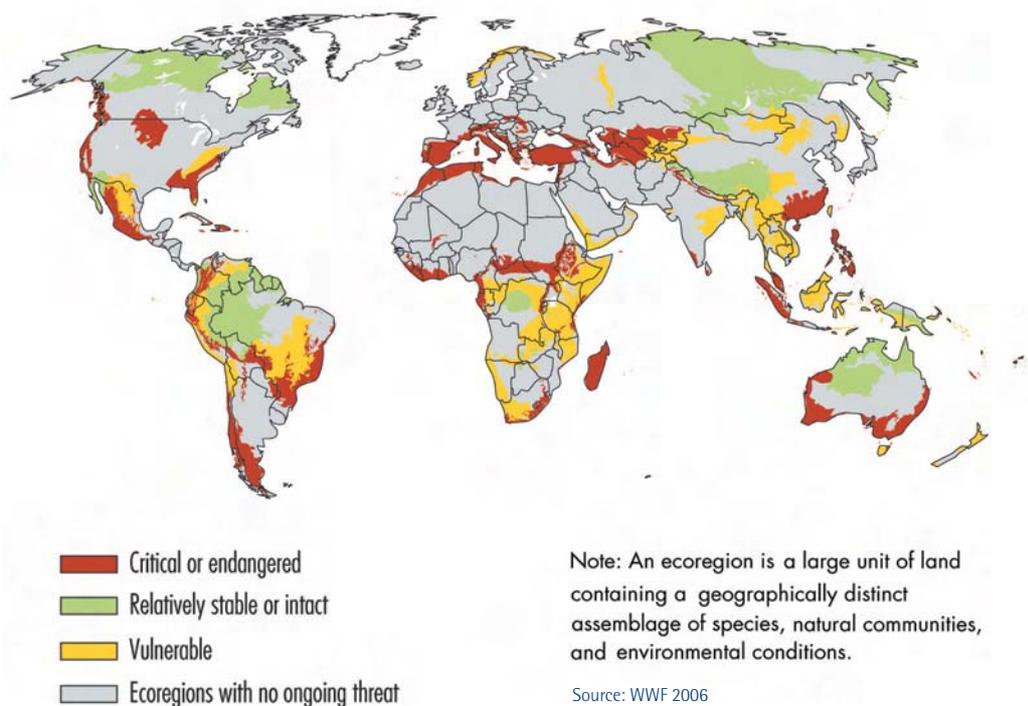
- Growing interest in **sustainability funds** with a focus on biodiversity and environmental technology.

²⁰UNEP FI: Bloom or Bust?, 2008 www.unepfi.org.

²¹UNEP FI: Insuring for Sustainability.



Figure 1: Status of terrestrial ecoregions



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