



THE ECONOMICS  
OF ECOSYSTEMS  
AND BIODIVERSITY  
TEEB FOR BUSINESS

- Chapter 1**     **Business, biodiversity and ecosystem services**
- Chapter 2**     **Business impacts and dependence on biodiversity and ecosystem services**
- Chapter 3**     **Measuring and reporting biodiversity and ecosystem impacts and dependence**
- Chapter 4**     **Scaling down biodiversity and ecosystem risks to business**
- Chapter 5**     **Increasing biodiversity business opportunities**
- Chapter 6**     **Business, biodiversity and sustainable development**
- Chapter 7**     **A recipe for biodiversity and business growth**

## Chapter 5: Increasing biodiversity business opportunities

**TEEB for Business Co-ordinator:** Joshua Bishop (International Union for Conservation of Nature)

**Editors:** Nicolas Bertrand (UNEP) and Francis Vorhies (Earthmind)

**Contributing authors:** Robert Barrington (Transparency International UK), Joshua Bishop (IUCN), Ilana Cohen (Earthmind), William Evison (PricewaterhouseCoopers), Lorena Jaramillo (UNCTAD), Chris Knight (PricewaterhouseCoopers), Brooks Shaffer (Earthmind), Franziska Staubli (SIPPO), Jim Stephenson (PricewaterhouseCoopers), and Christopher Webb (PricewaterhouseCoopers)

**Acknowledgements:** Stuart Anstee (Rio Tinto), Andrea Athanas (IUCN), Bruce Aylward (Ecosystem Economics), Ricardo Bayon (EKO Asset Management Partners), Maria Ana Borges (IUCN), Roberto Bossi (ENI) David Brand (New Forests), Jim Cannon (Sustainable Fisheries Partnership), Nathaniel Carroll (Ecosystem Marketplace), Catherine Cassagne (IFC and Sustainability Advisory Services), Sagarika Chatterjee (F&C Investments), Ian Dickie (Eftec), Steinar Eldoy (StatoilHydro), Eduardo Escobedo (UNCTAD), Jan Fehse (EcoSecurities), Sean Gilbert (Global Reporting Initiative), Marcus Gilleard (Earthwatch Institute Europe), Annelisa Grigg (Global Balance), Frank Hicks (Biological Capital), Ard Hordijk (Nyenrode Business University), Joël Houdet (Orée), Mikkel Kallesoe (WBCSD), Sachin Kapila (Shell), Becca Madsen (Ecosystem Marketplace), Nadine McCormick (IUCN), Andrew Mitchell (Global Canopy Programme), Jennifer Morris (Conservation International), Carsten Neßöver (UFZ), Bart Nollen (Nollen Group), Ashim Paun (Cambridge University), Paola Pedroni (ENI), Danièle Perrot-Maître (UNEP), Wendy Proctor (CSIRO), Mohammad Rafiq (Rainforest Alliance), Conrad Savy (Conservation International), Paul Sheldon (Natural Capitalism Solutions), Daniel Skambracks (KfW Bankengruppe), Dale Squires (U.C. San Diego), Alexandra Vakrou (European Commission), and Jon Williams (PricewaterhouseCoopers)

**Disclaimer:** The views expressed in this report are purely those of the authors and may not in any circumstances be regarded as stating an official position of the organisations involved.

The final edition of the TEEB for Business report will be published by Earthscan. If you have any additional information or comments you feel should be considered for inclusion in the final report then please email them by 6th September, 2010 to: teeb4biz@ufz.de

TEEB is hosted by the United Nations Environment Programme and supported by the European Commission; the German Federal Environment Ministry; the UK Government's Department for Environment, Food and Rural Affairs; the UK Department for International Development; Norway's Ministry for Foreign Affairs; The Netherlands' Interministerial Program Biodiversity; and the Swedish International Development Cooperation Agency.

# THE ECONOMICS OF ECOSYSTEMS AND BIODIVERSITY

## Chapter 5

### Increasing biodiversity business opportunities

#### Contents

Key messages	4
5.1 Introduction: Biodiversity as a business opportunity	5
5.2 Biodiversity and ecosystem services as a value proposition	7
5.2.1 Agriculture	7
5.2.2 Biodiversity management services	8
5.2.3 Cosmetics	9
5.2.4 Extractive industries	9
5.2.5 Finance	9
5.2.6 Fisheries	10
5.2.7 Forestry	11
5.2.8 Garments	12
5.2.9 Handicrafts	12
5.2.10 Pharmaceuticals	13
5.2.11 Retail	13
5.2.12 Tourism	14
5.2.13 Biodiversity: An opportunity for scaling up business	15
5.3 Emerging markets for biodiversity and ecosystem services	16
5.3.1 Regulatory markets for biodiversity and ecosystem services	16
5.3.2 Voluntary markets for biodiversity and ecosystem services	18
5.3.3 Opportunities for business in markets for biodiversity and ecosystem services	19
5.3.4 REDD+ and lessons for new ecosystem service markets	24
5.4 Tools to support markets for biodiversity and ecosystem services	28
5.4.1 Certification schemes for biodiversity and ecosystem service markets	28
5.4.2 Assessment and reporting for biodiversity and ecosystem service markets	29
5.4.3 Voluntary incentives for biodiversity business	30
5.4.4 Further considerations for institutional investors	31
5.4.5 Public policy to support biodiversity business	31
5.5 What is to be done?	33
References	36

## Boxes

- 5.1 Chocolats Halba: Implementing agroforestry to ensure cocoa bean security and partner satisfaction
- 5.2 Conservation Grade nature-friendly farming
- 5.3 Yemen LNG: Investing in marine biodiversity
- 5.4 HSBC: Scaling up opportunities through learning and awareness
- 5.5 Biodiversity venture capital
- 5.6 Walmart – stocking sustainable products
- 5.7 Bayer Health Care and Glucobay
- 5.8 A model for biodiversity? The growth of the carbon market
- 5.9 Examples of ecosystem service markets driven by regulation
- 5.10 Examples of voluntary markets for ecosystem services
- 5.11 Landmarks and prospects in the development of REDD and REDD+
- 5.12 Marriott invests in REDD: The Juma Sustainable Development Reserve
- 5.13 The association for social and environmental standards

## Figures

- 5.1 Key steps to developing an ecosystem services project
- 5.2 Three pillars to support the development of markets for ecosystem services
- 5.3 How REDD and forest carbon reduce the costs of climate change mitigation

## Tables

- 5.1 Identifying biodiversity and ecosystem service opportunities
- 5.2 The business case for engaging in ecosystem service markets
- 5.3 Business activities supporting ecosystem service markets
- 5.4 Business opportunities in REDD and forest carbon
- 5.5 Biodiversity and ecosystem service market opportunities

## Key messages

- **Biodiversity and ecosystem services offer opportunities for all business sectors:** The integration of biodiversity and ecosystem services into business can create tangible and significant added value for companies primarily by increasing the cost-effectiveness of operations, ensuring the sustainability of supply chains, or enhancing revenues from penetrating new markets and attracting new customers.
- **Biodiversity or ecosystem services can be the basis for new businesses:** Conserving biodiversity and using biodiversity and ecosystem services sustainably and equitably can be the basis for unique business propositions, enabling entrepreneurs and investors to develop and scale up 'biodiversity businesses.'
- **Biodiversity and ecosystem service markets are emerging, alongside markets for carbon:** New markets for biodiversity and ecosystem goods and services are emerging – as have markets for greenhouse gas emission reductions and carbon – providing new biodiversity assets with local and international trading opportunities. A first major opportunity is likely to be Reducing Emissions from Deforestation and forest Degradation and related land-based carbon storage and sequestration methods (REDD+).
- **Tools for building biodiversity business are in place or under development:** Critical market-based tools for capturing biodiversity and ecosystem services opportunities, such as biodiversity performance standards for investors; biodiversity-related certification, assessment and reporting schemes; and voluntary incentive measures are already available or under development and could be promoted across all business sectors and markets.
- **Appropriate public policies can create an enabling framework for new biodiversity and ecosystem service business opportunities:** A range of public policy measures at national and international levels can create the enabling framework to scale up biodiversity and ecosystem services as viable business opportunities, such as payments for ecosystem services, REDD+, 'green development' finance, Access and Benefit Sharing, tax incentives, performance standards, and development cooperation.

# 5.1 INTRODUCTION: BIODIVERSITY AS A BUSINESS OPPORTUNITY

Can businesses increase revenues and decrease costs by conserving biodiversity, restoring ecosystems or using biological resources sustainably? Does biodiversity offer new opportunities for business? This chapter examines these questions through the lens of three different approaches:

- By integrating biodiversity into business decision-making, companies can enhance their performance by reducing risk, increasing revenue streams, reducing costs or improving their products.
- Biodiversity itself presents potentially huge untapped opportunities in the form of new products and services – i.e. 'biodiversity business' opportunities.
- New markets for biodiversity and ecosystem services are emerging – inspired in part by the development of carbon markets; if scaled up, these markets could represent major business opportunities and a significant part of the solution to the biodiversity finance challenge.

Through a series of case studies and other examples, this chapter illustrates the diversity of realized or promising opportunities within these three categories. The chapter also considers the enabling conditions required to see these opportunities expand to their full potential, defines a set of questions to help business identify such opportunities, and identifies some of the potential challenges.

Table 5.1 provides a framework for identifying potential biodiversity and ecosystem service opportunities for various sectors. It is similar to the table used in previous chapters to identify biodiversity and ecosystem service risks and opportunities. Importantly, biodiversity and ecosystem service risks and opportunities are likely to be different in scope and significance for different sectors. With respect to opportunities, the following section in this chapter highlights a range of potential opportunities for a number of major business sectors. These are also indicated by a black circle in Table 5.1.

Table 5.1 Identifying biodiversity and ecosystem service opportunities

		Indicative market sectors with BES opportunities					
Categories	Indicative BES opportunities	Biological resource-based industries (e.g. forestry, farming, fishing)	Extractive industries (e.g. mining, oil and gas)	Consumer goods (e.g. clothing, cosmetics, furniture)	Consumer services (e.g. retailers, tourism)	Health care (e.g. pharmaceuticals, bio-therapy)	Financials (e.g. banking, biodiversity services, green investment funds)
<b>Operational</b> day-to-day activities, expenditures and processes of the company	Increased quality, decreased cost of inputs	●		●	●	●	
	Increased output or productivity	●					●
	Sustainability of business operations	●	●				
	Supply chain opportunities			●	●	●	
<b>Regulatory and legal</b> Laws, policies, court actions that can affect performance	Lower transition costs in anticipating new policies		●				●
	Mitigation of risk due to environmental disaster		●				●
<b>Reputational:</b> brand, image, relationship with stakeholders	Improvement to brand or image	●		●	●		
	Attract new customers			●	●	●	
	Reach new niche markets			●	●	●	
<b>Markets &amp; products:</b> Factors that can affect corporate market performance	Changes in consumer preferences	●			●	●	
	Purchaser requirements	●		●			
<b>Financing:</b> Cost and availability of capital	Attract growing SRI investment	●	●	●	●	●	

Source: Adapted from Evison and Knight (2010) and WRI et al. (2008)

## 5.2 BIODIVERSITY AND ECOSYSTEM SERVICES AS A VALUE PROPOSITION

'Biodiversity businesses' -- defined as "commercial enterprises that generate profits via activities which conserve biodiversity, use biological resources sustainably, and share the benefits arising from this use equitably" (Bishop et al. 2008) -- may focus on biodiversity-friendly production of commodities (food, timber, fabrics) or the sustainable use of ecosystems (tourism, extractives, cosmetics, pharmaceuticals). Their reliance on biodiversity and ecosystem services makes sustaining their supply chains and raw materials of vital importance.

The number of businesses profiting directly or indirectly from biodiversity and ecosystem services has risen sharply in recent years. Business leaders realise that biodiversity and ecosystem services pose new opportunities for improving their companies' profit margins and performance levels. Integrating biodiversity conservation and ecosystem services into supply chain management or utilising biodiversity and ecosystem services responsibly in current products and practices can result in significant savings and revenues for businesses, as well as heightened efficiency and success. Good risk management pertaining to biodiversity and ecosystem services often leads to tangible savings, and biodiversity and ecosystem services can frequently unleash hidden value in existing production and marketing practices. The benefits from integrating biodiversity and ecosystem services are especially advantageous in that they also generate corporate social responsibility opportunities at a time when the public is increasingly aware of the importance of environmental conservation.

The growing interest to conserve the environment, combined with consumers' focus on health, wellness and humane sourcing, is changing the marketplace. For example, Lifestyles of Health and Sustainability – or LOHAS – consumers are focused on health and fitness, the environment, personal development, sustainable living, and social justice ([www.lohas.com](http://www.lohas.com)). This global movement includes over 80 million consumers, representing a potential market of US\$500 billion for food products, sustainable tourism, green building suppliers, and low-energy consumption equipment, among other products and services.

In this context, biodiversity and ecosystem conservation and sustainable use represent an array of business opportunities. The following pages highlight various industries and businesses that are profiting from biodiversity and ecosystem services, both directly from conservation and sustainable use, and indirectly through the incorporation of biodiversity and ecosystem services in existing products and services.

### 5.2.1 AGRICULTURE

Many consumers increasingly prefer organic foods. In addition to healthier products, these consumers are seeking traceability, ethical sourcing, sustainability, and corporate social responsibility (Organic Monitor 2009a). In response to these trends, major brands are shifting toward natural, fair trade and organic products (Kline & Company 2009)<sup>1</sup>.

Organic Monitor estimated global sales of organic food and drink in 2007 at US\$46 billion, a threefold increase since 1999. US organic food sales alone (3.5% of the total US food market) grew by 15.8% in 2008, reaching US\$22.9 billion and almost tripling the growth rate of the food sector for the same year, as stated by the Organic Trade Association (OTA 2009; Organic Monitor 2009b).

Fair trade has also gained importance as a means to source sustainable agricultural products. In 2008, fair trade certified sales amounted to approximately US\$4.08 billion worldwide, a 22% increase on the previous year. Although this still represents a small fraction of world trade, fair trade products in some categories can account for 20-50% of sales. In June 2008, it was estimated that over 1 million farmers and their families were benefiting from fair trade-funded infrastructure, technical assistance, and community development projects (FLO 2010).

Other sustainable agricultural practices include those promoted by Rainforest Alliance, which account for 205,000 hectares certified for the production of agricultural products such as bananas, cocoa, coffee, tea, citrus, flowers, and pineapples. These hectares directly benefit more than one million people in 14 countries and ensure a net positive impact on biodiversity and ecosystem services (Willie 2009).

#### **Box 5.1 Chocolats Halba: Implementing agroforestry to ensure cocoa bean security and partner satisfaction**

Chocolate and confectionery company Chocolats Halba, a subsidiary of Swiss retailer COOP, has integrated sustainable cocoa sourcing into its supply chain. Like the rest of the chocolate industry, the company faces chronic supply shortages. Because of price instability, cocoa production is more risky for small-scale farmers, who produce most of the world's cocoa; many are searching for alternative employment opportunities. Chocolats Halba discovered that the best way to support farmers was to establish diversified agroforestry systems that include cocoa as one of many crops. In such systems, biodiversity is generally higher because they establish a more diverse landscape. With agroforestry systems, farmers also have a higher and more diverse income, which means that cocoa farming is not only good for biodiversity and ecosystem services – it is also good for making cocoa growing attractive again. According to Christoph Inauen, Head of Chocolats Halba Sustainability and Projects:

“Farmers that work with us realise that we are not only interested in cocoa but also in their livelihood, their income, biodiversity (we help them reforest deforested areas), and other issues. This makes our relationship very strong: farmers give their best to improve the quality of the cocoa in order to give us something back. So we have reliable sourcing partners and very strong relationships with our farmers. In the case of a supply shortage, this would surely help us.”

The benefits of biodiversity-based corporate social responsibility lie with the quality of its products, the security of its supply chain, the long-term contentment of its cocoa-growing partners, and the positive environmental impacts being generated in tropical countries—which are among the most important regions for conserving biodiversity and ecosystem services.

*Source: Inauen (2010a and 2010b)*

## **5.2.2 BIODIVERSITY MANAGEMENT SERVICES**

Biodiversity management and advisory services range from advising companies on possible biodiversity and ecosystem service risks during an environmental impact assessment, to developing corporate biodiversity strategies and action plans, to independent auditing or reviewing of a company's biodiversity performance.

Although most biodiversity management services focus on mitigating biodiversity risk, there are also services exploring how to capture biodiversity opportunities – for example, by exploring how biodiversity-friendly supply chains can improve a company's marketability among investors or consumers. One example is the collaboration

### Box 5.2 Conservation grade nature-friendly farming

The UK-based Conservation Grade certification system of 'nature-friendly farming' provides food brands, producers and consumers with efficient food production while enhancing biodiversity and ecosystem services and preventing wildlife declines on farmland. It does so by requiring Conservation Grade farmers to take 10% of their land out of production for conversion to wildlife habitats. In return, these farmers are able to use the Conservation Grade logo on all of their products and have access to a supply contract for their produce for which there is a guaranteed premium over the market price.

The Conservation Grade farming scheme exemplifies innovative new solutions to feeding the growing world population without destroying biodiversity and ecosystem services. Independent scientific trials have demonstrated that the Conservation Grade system leads to significant increases in biodiversity, as compared to conventional agriculture, without foregoing output for the land under conservation.

*Source: <http://www.conservationgrade.org/>*

between a large German energy company, E.On, and IUCN on greening so-called 'blue energy.' IUCN is helping the company to better understand both the biodiversity risks and opportunities of supplying electricity from offshore renewable technologies, such as wind farms, and thus is enabling the company to better manage its biodiversity impacts (Wilhelmsson et al. 2010).

### 5.2.3 COSMETICS

Natural and organic cosmetic companies were the early adopters of organic and fair trade products, sourcing these ingredients and launching certified products well before other industries. Some of these companies have set up fair trade and organic projects to protect endangered plant species and encourage sustainability. Others are using fair trade to guarantee long-term supply of organic ingredients. Major companies in the organic cosmetic sector reported positive growth for 2008, including Weleda, with a sales increase of 9.5% to €238.3 million; Wala, with 'Dr. Hauschka' brand sales increasing by 7.3% to €103 million; and Lavera, with an increase of 16% to €35 million (BioFach 2009a and 2009b)<sup>2</sup>.

### 5.2.4 EXTRACTIVE INDUSTRIES

Oil, gas and mining companies, by their very nature, can have significant impacts on the natural environment; these impacts often lead to negative consumer perceptions of these industries. Businesses in this sector are therefore well placed to take advantage of the numerous opportunities created by biodiversity and ecosystem services (Box 5.3).

### 5.2.5 FINANCE

The finance sector stands to benefit from biodiversity and ecosystem services in many ways, including improved stakeholder perception, streamlined operations, enhanced ability to attract talent, and increased profit through investments in biodiversity and ecosystem services (Box 5.4).

Several bio-enterprise investment funds have emerged to invest in businesses that demonstrate potential to deliver both financial returns and biodiversity and ecosystem benefits. A few funds, or proposed funds, have also faced difficulties, generating useful lessons about the particular constraints of investing in biodiversity businesses. Some investment funds couple financial assistance with business development assistance and the development of

**Box 5.3 Yemen LNG: Investing in marine biodiversity**

Yemen LNG Company Ltd is involved in a large-scale energy project that includes the construction and operation of a liquefied natural gas plant in the area of Balhaf, Republic of Yemen – a remote spot on the country’s south coast. The company has implemented a marine biodiversity action plan in order to improve its environmental performance and in turn its attractiveness to investors and the public. One major challenge for such a large-scale project is to ensure the credibility of the company’s environmental strategies and their implementation.

In early 2009, Yemen LNG finalized a partnership with IUCN to design and manage an independent review process for the company’s marine biodiversity action plan. Specifically, the agreement is to obtain independent third-party assessment of the company’s strategy for marine biodiversity protection and implementation of its biodiversity action plan. Through such an independent environmental auditing process, the company hopes not only to improve its performance with respect to both the environmental and social aspects of its marine biodiversity strategy, but also to be able to demonstrate to its Board, investors and other stakeholders that it is doing so.

*Source: [http://yemenlng.com/ws/en/go.aspx?c=soc\\_Environment](http://yemenlng.com/ws/en/go.aspx?c=soc_Environment)*

management expertise, so as to improve biodiversity and ecosystem services business management, build capacity and help ensure better returns. Examples include Verde Ventures, an arm of Conservation International (CI), the Eco-Enterprises Fund, an arm of The Nature Conservancy (TNC), and Root Capital, formerly EcoLogic Finance (Box 5.5).

**5.2.6 FISHERIES**

In response to the crisis in this sector, fishing fleets and companies must care increasingly about the sustainability of supply. The sector also has the opportunity to cater to the growing number of LOHAS consumers eager to consume fish without negatively impacting the environment. Several certification and eco-labelling schemes for sustainably managed fisheries have emerged, providing assurance to these buyers and consumers. Perhaps the most recognized organisation certifying sustainable seafood is the Marine Stewardship Council (MSC) ([www.msc.org](http://www.msc.org)).

**Box 5.4 HSBC: Scaling up opportunities through learning and awareness**

In 2002, HSBC launched Investing in Nature, a \$50-million, five-year partnership with several conservation organisations. As part of this initiative, HSBC sent 2,000 of its employees on Earthwatch Institute field research projects around the world and supported the training of 230 developing-country scientists. Participating HSBC employees also had a responsibility to undertake an environmental project in their workplace or local community, supported by a small grant from the company. This initiative not only supported conservation on the ground but did so in a way that strengthened biodiversity and ecosystem services awareness and commitment across the HSBC workforce.

Employees who participated in Investing in Nature, as well as those who take part in the more recent HSBC Climate Partnership, bring their new knowledge of biodiversity and ecosystems back to the company, acting as ‘environmental champions’ within the business and developing projects that further HSBC’s commitment to sustainability. Such projects can help increase the company’s ability to attract young talent (Connor 2010).

A recent independent evaluation undertaken by the Ashridge Business School concluded that 80% of senior HSBC managers agreed that the programme contributes to embedding sustainability into the ‘DNA’ of the business, while 83% agreed it is worth the investment because the programme gives HSBC a competitive advantage.

*Source: <http://www.hsbc.com/1/2/newsroom/news/2002/investing-in-nature-2002#top> and [http://www.earthwatch.org/europe/our\\_work/corporate/corporate\\_partners/hsbc/hcp/](http://www.earthwatch.org/europe/our_work/corporate/corporate_partners/hsbc/hcp/)*

### Box 5.5 Biodiversity venture capital

**Verde Ventures** provides support to small and medium-sized businesses that contribute to healthy ecosystems and human well-being. It applies a pre-investment biodiversity review process as well as a post-investment biodiversity monitoring. Since its creation, in 2003, it has helped partners restore and conserve more than 300,000 hectares of important lands and generate sales of nearly US\$32 million. As of 31 March 2010, it had invested US\$14.8 million in agroforestry, alternative energy, ecotourism, sustainable harvest of wild products and marine initiatives.

For over a decade, the **EcoEnterprises Fund** has invested in sustainable businesses, particularly small and growing businesses in Latin America and the Caribbean ([www.ecoenterprisesfund.com](http://www.ecoenterprisesfund.com)). The Fund also complements targeted financing with technical assistance to foster success. The first Fund, launched jointly by The Nature Conservancy and the InterAmerican Development Bank's Multilateral Investment Fund in 2000, deployed US\$6.3 million to 23 sustainable companies, with products ranging from organic shrimp to organic spices, from FSC-certified furniture to pesticide-free biodynamic flowers and acai palm berry smoothies. The businesses created over 3,500 jobs, generated US\$281 million in sales, leveraged US\$138 million in additional capital and conserved 860,773 hectares of land. A new investment fund, EcoE II, is to be launched by the end of 2010 and will target companies at the next stage of business growth, providing expansion capital and advisory support to help develop operations and bring results to scale.

**Root Capital**, a non-profit social investment fund, focuses on sustainable grassroots businesses in the rural areas of developing countries, specifically targeting those businesses that are caught in the 'missing middle', too small and risky to access capital from mainstream banks and too large for microfinance. It complements its provision of capital with financial education and training and provides connections to emerging ethical supply chains. Since its launch in 2000, it has provided over US\$175 million in credit to 265 small and growing businesses in 30 countries, maintaining a 99% repayment rate from borrowers. For many of its loans, the fund uses future sales contracts from companies like Green Mountain Coffee Roasters, Marks & Spencer, Starbucks, and Whole Foods as collateral.

Most companies in the sector, from suppliers to sushi restaurants, claim that carrying the MSC label has provided several business opportunities. These include access to new markets—both geographically and in terms of new niche markets from sustainable product categories—and retention of existing markets. Small-scale fishermen report price premiums for their certified fish. For the US-based fish restaurant Bamboo Sushi, selling only sustainable seafood is a lucrative business model—the restaurant's sustainable menu has made it more successful than ever ([www.bamboosushipdx.com](http://www.bamboosushipdx.com)). Big retailers, including discounters Aldi and Lidl, request MSC-certified frozen products from their suppliers. With consumers and seafood buyers increasingly aware of the importance of healthy oceans, today the growing market for MSC-certified seafood is estimated to be worth over US\$2.5 billion (MSC 2009).

## 5.2.7 FORESTRY

Consumer preference for products derived from sustainably managed forests has strongly driven this industry's development and marketing techniques. Forest management certification is becoming an important requirement to access the EU market, which is considered the largest consumer and importer of timber and timber-derived products worldwide. Certified timber is now increasingly available in international markets.

Certification schemes for the forestry sector include the Forest Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification Scheme (PEFC), and the Rainforest Alliance (RA). By May 2009, the global area of certified forest endorsed by FSC and PEFC amounted to 325.2 million hectares, approximately 8% of global forest area. Certified wood products are now common in many large retailers like B&Q in the UK, Home Depot in the US and Ikea worldwide.

### 5.2.8 GARMENTS

According to Environmental Leader, consumers' preference for ethically sourced, organic and fair trade fabrics will continue to grow for the garment industry as well (Willan 2009). Eco-fabrics are thought to bring 'something extra' to the product (Prescott 2009) and natural fibres - mainly cotton and blends - are fashionable and often preferred over man-made fibres (CBI 2008).

In the garment and textile sector, organic cotton has become a marketing tool for many companies. Today, organic cotton cultivation covers about 32 million hectares of land (FiBL and IFOAM 2009). Global retail sales of organic cotton clothing and home textiles accounted for more than US\$3 billion in 2008 ([www.naturalfibres2009.org](http://www.naturalfibres2009.org)).

Especially in Europe, there is a widespread demand for natural fibres other than organic cotton; this varies slightly depending on yearly trends and inputs. On the other hand, textured silks are in constant demand and are rapidly increasing in popularity.

Natural fibres such as pima cotton, alpaca wool, or mohair wool have also recently become popular. They are mainly used in high-end products due to their relatively high production and raw-material costs and therefore remain a niche market. Developing country companies such as The Star Knitwear Group of Mauritius, during Texworld 2009, presented fabrics elaborated not only from Africa's cotton but also from bamboo, corn, Tencel, and Modal (Prescott 2009; [www.eartheasy.com](http://www.eartheasy.com)).

Sustainable leather is used in the garment and accessories industries in such items as jackets, belts, purses, luggage and wallets. This might come from the skins of animals such as crocodiles, lizards and snakes that are sustainably managed and legally traded. There are many opportunities for this sector to engage in profitable biodiversity and ecosystem services conservation, as consumers are demanding eco-friendly small leather goods, whether they are made from recycled materials or using environmentally friendly production processes, e.g. tanning (CBI 2009b; Mazzanti et al. 2009).

### 5.2.9 HANDICRAFTS

The biodiversity-based handicrafts sector is another area that provides opportunities for job creation in developing countries. In Vietnam, for example, handicrafts directly involve almost two thousand craft villages and are expected to generate US\$1.5 billion in turnover by 2010 (VIETRADE 2006 and 2008). The products are made from biological resources (bamboo, rattan, rush, leaf, wood, etc.) and other materials such as metal and stone.

Handicrafts are strongly influenced by fashion trends, consumer purchasing patterns and economic conditions (Barber et al. 2006). Social and environmental values are gaining importance within this sector and a fair trade movement is appearing in the handicrafts and decoration sector. An international 'label' for this sector is now available from the World Fair Trade Organisation (WFTO) ([www.wfto.com](http://www.wfto.com)).

**Box 5.6 Walmart - stocking sustainable products**

In 2005, Walmart announced a new environmental strategy involving, among other objectives, a commitment to sell sustainable products. The company is implementing a sustainable product index to assess the environmental impacts of the products it stocks and relaying this information to its customers by way of a labelling system. The sustainable product index measures such facets of production as energy usage, material efficiency and human conditions; products with higher scores have lower environmental footprints and promote biodiversity and ecosystem services conservation in numerous ways. Walmart has stated that its customers want:

“products that are more efficient, last longer and perform better. They want to know the product’s entire lifecycle. They want to know the materials in the product are safe, that it is made well and is produced in a responsible way.”

Therefore, Walmart’s sustainable product initiative increases customer numbers and business revenues, while at the same time reducing the company’s expenses—for example, through decreased dumpster costs from the elimination of excess product packaging.

*Sources: Plambeck et al. (2008); <http://walmartstores.com/Sustainability/>; <http://walmartstores.com/Sustainability/9292.aspx>; Bernick et al. (2010)*

**5.2.10 PHARMACEUTICALS**

Many businesses use wild genetic resources as inputs to production. Over 400,000 tons of medicinal and aromatic plants are traded worldwide every year; 80% are wild harvested, mostly without consideration of where they come from or the sustainability of collection practices (Traffic International 2006). Demand continues to grow for these plants.

The pharmaceutical industry is an important user of wild genetic resources, along with biotechnology, seed producers, animal breeders, crop protection services, horticulture, cosmetics, fragrance, botanicals, and the food and beverage industries. Each sector is part of a unique market, with distinct research and development processes and different demands for access to genetic resources (Laird and Wynberg 2005).

Consistent data on the use and value of genetic resources do not exist for most sectors and only rough estimates are available. For example, ten Kate and Laird (1999) suggest that between 25 and 50 percent of the value of global pharmaceutical sales is based on the use of genetic resources. Based on the total market value of the pharmaceutical sector – currently around US\$ 825 billion according to IMS (2009) – these ratios imply that the value of genetic resources used in medicine may be between US\$ 206 and 412 billion. By comparison, the commercial global seed market, which also relies on wild genetic material, is expected to reach a total value of US\$ 42 billion in 2010 (Global Industry Analysts 2008). An example is provided in Box 5.7.

Wild ingredients and other raw materials used in the medical sector may be certified organic but are often not labelled as such, as the final product typically does not allow for this. More generally, producers can refer to the Good Agricultural and Collection Practices (GACP) for medicinal plants (WHO 2003), and ensure that documentation is complete and traceable in order to guarantee the origin and consistent quality of wild products. Adherence to such practices can help ensure a stable source of raw materials and thus a more secure supply chain, as well as reducing the risk of charges of ‘bio-piracy’ or inadequate benefit sharing (for further discussion see chapter 6).

**5.2.11 RETAIL**

Large retailers can have significant impacts on biodiversity and ecosystem services, through such measures as sustainable sourcing, discernment in choosing which items to stock, improved packaging and distribution techniques. In return, these companies can benefit from decreased operating costs, heightened customer loyalty and increased supply chain security.

### Box 5.7 Bayer Health Care and Glucobay

Glucobay is an oral antidiabetic manufactured by Bayer Health Care, sold since 1990 and currently approved in over 95 countries. The active ingredient of Glucobay is the natural sugar Acarbose, which inhibits the absorption of glucose into the bloodstream in the small intestine and thereby prevents potentially dangerous spikes of glucose ('blood sugar'). Based on data provided in Bayer's annual reports, since at least 2001 Glucobay has been one of the company's ten best-selling pharmaceutical products, accounting for about Euro 300 million in annual sales or between 5 and 8 percent of sales by Bayer's primary health care division.

In US Patent No. 3951745 of 1974, Bayer scientists wrote that they had isolated a number of strains of the *Actinoplanes* sp. bacteria with a high efficiency of inhibiting the enzyme glucosidase. They further disclosed that they obtained the strains from public and private micro-organism collections in several countries, including twelve strains obtained in Kenya (Frein and Meyer 2008). In 1995, Bayer filed for a patent on a new way to manufacture the product. The patent application (US 5753501), which was subsequently issued in Europe, the USA and Australia, reveals that an *Actinoplanes* sp. bacteria strain called SE 50 had unique genes that enable the biosynthesis of acarbose in fermentors. This strain originates from Kenya's Lake Ruiru. In 2001, in an article in the *Journal of Bacteriology*, a group of Bayer scientists and German academics confirmed that SE 50 was being used to manufacture acarbose (McGown 2006). Since 1990, it may be estimated that Bayer has generated sales of Glucobay, produced with soil bacteria originating from Kenya, worth at least Euro 4 billion.

*Source: al-Janabi, S., and Drews, A. (2010) for TEEB*

## 5.2.12 TOURISM

New consumer trends toward more environmentally sustainable activities have positively affected the tourism sector. One survey indicates that 'sustainable travellers' are willing to spend an average of 10% more on travel services and products provided by environmentally responsible tourism suppliers (CBI 2009a).

Many travel agents have realised that sustainable tourism provides an excellent market opportunity, in which economic profit and respect for the environment go hand in hand. By 2009, in South Africa – where the first label for FairTrade Tourism was developed – about 45 tourism products had been certified, including hotels, safari lodges, guest houses, backpacker lodges, eco-adventure activities, and township tours. Both local and international tour operators use the certification, according to the standards of FairTrade Tourism South Africa, including operators from Germany, Switzerland and the UK (CBI 2004 and 2009c; FTSA 2009).

The International Ecotourism Society (TIES) has developed a worldwide network in support of "responsible travel to natural areas that conserves the environment and improves the well-being of local people" ([www.ecotourism.org](http://www.ecotourism.org)). With members in over 90 countries including more than 50 local, national and regional ecotourism associations, TIES engages in awareness raising and educational projects to build the market for ecotourism.

Further evidence of the growth of this sector is the announcement in late 2009 that the Partnership for Global Sustainable Tourism Criteria (GSTC) and the Sustainable Tourism Stewardship Council (STSC) will merge to become the Tourism Sustainability Council (TSC 2009). In 2010 this new global membership council will be launched to offer a common understanding of sustainable tourism and the adoption of universal sustainable tourism principles and criteria.

There are many hundreds of examples of successful ecotourism companies, and there is a growing number of organisations promoting these companies. For instance, the Athens-based EcoClub promotes "ecologically and socially just tourism" ([www.ecoclub.com](http://www.ecoclub.com)), and Planeta.com offers a World Travel Directory "for those seeking meaningful eco-friendly, people-friendly, and place-friendly travel" ([www.planeta.com](http://www.planeta.com)).

**Box 5.8 A model for biodiversity? The growth of the carbon market**

**Size and growth of carbon markets** – The overall carbon market grew in 2008 to a total value transacted of about US\$126 billion (€86 billion), double its 2007 value. This includes both project-based transactions, such as CDM projects and the voluntary market, and the allowances market, such as the EU Emissions Trading System.

**Size and growth of businesses that have commercialised climate change opportunities** – Global revenues for companies involved in the wind, solar and biofuels markets reached \$116 billion in 2008 – an almost ten-fold rise over five years. Despite the set back in 2009, due to the global recession, the long-term prognosis is still for a rapid rise, to over \$300 billion annually by 2020. For the first time, one sector alone – wind – had revenues exceeding \$50 billion. One estimate based on a broader definition of climate change-related sectors, including energy efficiency, waste and water, suggests that global revenues already exceed \$530 billion and could grow to \$2 trillion by 2020 – which would make the sector comparable in size to today’s global oil and gas industry.

**Size and growth of investments in climate change opportunities** – According to a recent UNEP report, new global investments in sustainable energy technologies – including venture capital, project finance, public markets, and research and development – reached \$155.4 billion in 2008, an increase of 4.7 percent from \$148.4 billion in 2007, despite the economic downturn.

*Sources: World Bank (2009); [http://ec.europa.eu/environment/climat/emission/index\\_en.htm](http://ec.europa.eu/environment/climat/emission/index_en.htm); Clean Edge (2009), HSBC (2009); UNEP et al. (2009)*

**5.2.13 BIODIVERSITY: AN OPPORTUNITY FOR SCALING UP BUSINESS**

Even businesses lacking an apparent direct interaction with the natural world can find opportunities and incentives in changing societal and consumer preferences to ‘go green’. Consumers increasingly value products and services that have a positive and meaningful association with the environment. Corporate action on biodiversity and ecosystem services can therefore help businesses distinguish themselves from their competitors while also improving relations with investors, employees and communities. This shift can enhance investments—whether from socially conscious investors or the growing number that increasingly see adept environmental management as a proxy for good overall management—help attract top young talent, who are increasingly aware of the natural world and their impact on it, and build good will both locally and internationally.

In addition, there is a vast array of biodiversity and ecosystem services business opportunities already being captured in the marketplace. By incorporating biodiversity and ecosystem services into entrepreneurial thinking and business planning, opportunities to scale up existing BES businesses as well as to develop new areas for pro-biodiversity businesses are sure to emerge in the short term.

# 5.3 EMERGING MARKETS FOR BIODIVERSITY AND ECOSYSTEM SERVICES

Ecosystem service markets may be defined as “the bringing together of a buyer and seller so that they can trade ecosystem service credits” (Ecosystem Services Project 2008). Within this definition, ecosystem service credits can be considered marketable units representing the protection and/or enhancement of ecosystem services.

The presence of market-traded credits is a distinguishing factor from other forms of payment schemes such as private payments for ecosystem services (e.g. Australian water permitting schemes), public payment programmes (e.g. New York payments to land owners in Catskill/Delaware and Croton watersheds), and certification schemes (e.g. Marine Stewardship Council), which could fall under the general heading of payments for ecosystem services (PES) (TEEB 2009).

The main reason for establishing ecosystem service markets is to ‘internalize’ the external ecological costs of doing business (as opposed to using ecosystems ‘for free’, which as we have seen tends to lead to over-use). Who ends up paying the cost of using ecosystem services will depend on market structure, the availability of substitutes and other factors. In general, we can expect that part of the cost will be absorbed by business and part may be passed on to the final consumer. Other reasons for business to engage in ecosystem service markets are outlined below (Table 5.2).

**Table 5.2 The business case for engaging in ecosystem service markets**

<b>1. Market differentiation</b>	Businesses that take a lead in ecosystem service markets can differentiate themselves from competitors and may be more likely to stay ahead of regulatory, investor, or consumer expectations. Benefits include regulatory goodwill, reputational benefits, and potential improvements in staff recruitment and retention (Mulder et al. 2006), as well as helping to ensure the long-term sustainability of business operations.
<b>2. Revenue generation: selling credits</b>	Growth and diversification of ecosystem service markets is increasing the opportunity to invest in or develop projects that generate revenue through the sale of BES credits. Indications suggest that this growth will continue, although ambiguities around the pace and nature of regulatory reform are leading to uncertainty about the pattern of growth.
<b>3. Revenue generation: supporting services</b>	The market for supporting and advisory services for ecosystem markets is likely to grow in conjunction with market expansion and diversification. As competition increases, markets will benefit from higher service standards, with early movers defining these standards to a great extent. It is these early movers who are likely to establish themselves in ecosystem service markets and may receive the bulk of the financial rewards.

## 5.3.1 REGULATORY BIODIVERSITY AND ECOSYSTEM SERVICES MARKETS

Markets for ecosystem services can be divided into regulatory or ‘compliance’ markets and voluntary markets. This section examines ecosystem service markets enabled by government regulations, while voluntary markets are considered in the following sub-section.

Regulatory markets are driven by government or regulatory bodies that set a limit or ‘cap’ on the degree of ecosystem use or damage permitted in a certain area, or create tradable quotas for ‘sustainable’ activities (e.g. wind power generation). Regulation then allows firms or individuals to trade ecosystem service credits in order to meet their obligations or profit from surplus credits (Fischer 2003). This kind of market is possible because the cost of reducing environmental damages or meeting the quota is not equal for all, for example because of technological requirements or scale issues. Firms or individuals for whom the cost is relatively high will tend to purchase credits from firms or individuals who can meet the quota at lower cost or have more credits than they need. Examples are provided in Box 5.9.

#### Box 5.9 Examples of ecosystem service markets driven by regulation

**Australia – BushBroker:** The clearing of native vegetation in the State of Victoria is regulated under the Victorian Planning and Environment Act of 1987. In 2006, the Victorian Government introduced the BushBroker scheme, which requires that clearing of native vegetation be compensated by an appropriate offset. Permit applicants can source these offsets through the BushBroker register. Offsets are gains in native vegetation extent and/or condition that are permanently protected and linked to a particular clearing site. Applicants can either generate offsets on their own property or purchase these offsets as native vegetation credits from third-party providers. To date, over \$4 million worth of trades have been facilitated by the programme.

The system also allows the ‘banking’ of credits for future use. For instance, a construction company could donate land for the conservation reserve system and register the resulting credits for future offset use. The major revenue generation opportunity for business is through the generation of native vegetation credits through improved land management, re-vegetation of previously cleared areas, and protection of existing stands of trees. This relatively low-cost process can generate significant additional income from land that might otherwise have low commercial value. Average prices for credits under the BushBroker scheme have ranged from AUD \$42,000 to \$157,000 per hectare.

**U.S. – Biodiversity banking:** The US Federal Endangered Species Act prohibits development that leads to declines in populations of endangered species. Land owners obliged to mitigate their impacts on endangered species habitat can buy credits from approved biodiversity banks. One example is the Mariner Vernal Pool Conservation Bank, a 160-acre bank that has plans to generate USD\$50 million in revenue and, by March 2007, had sold \$4.4 million worth of credits. Another is the Sutter Basin Conservation Bank, a 424-acre bank that has announced plans to generate \$15 million in revenue by selling Giant Garter Snake habitat credits. These credits, equivalent to one acre of snake habitat each, are required by developers to meet permit obligations imposed by the U.S. Fish and Wildlife Service and the California Department of Fish and Game for protecting Giant Garter Snake habitat.

**U.S. – Wetland banking:** The US Federal Clean Water Act obliges developers to compensate for the destruction of wetlands. Developers can provide their own compensation or purchase credits, in the form of wetland acres, within the same watershed as their development to offset the ecological damage they cause. Between 20 and 30 percent of the 450-plus approved wetland banks in the U.S. have been developed by large corporations, predominantly energy or pipeline companies such as Chevron, Tenneco, and Florida Power and Light. These companies have surplus land, are looking for ways to diversify their income streams, and are attracted by relatively low costs<sup>3</sup>. The US market in wetland credits is currently worth about USD\$1.1 – 1.8 billion annually.

*Sources: Victoria Department of Sustainability and Environment (2006), WRI (2008), Bayon et al. (2006), Ecosystem Marketplace wetland mitigation database (2009)*

### 5.3.2 VOLUNTARY BIODIVERSITY AND ECOSYSTEM SERVICES MARKETS

These markets occur where motivated counterparties voluntarily enter into a buying and selling agreement for ecosystem service credits, without reference to regulatory requirements. Companies take this action voluntarily in order to manage ecosystem-related risk, improve corporate social and environmental performance, and in some cases, prepare for anticipated regulatory markets. This last factor means that the governance systems and standards used in regulatory markets have a significant influence over those used in voluntary markets (and vice versa). Examples of voluntary markets for ecosystem services are provided in Box 5.10.

#### 5.10 Examples of voluntary markets for ecosystem services

**Green development mechanism (gdm)** is the working name of a proposed innovative financial mechanism under the Convention on Biological Diversity (CBD) intended to engage business in its implementation (UNEP/CBD/WG-RI/3/INF/13 2010). A gdm could mobilise private sector finance to mitigate biodiversity loss through a market mechanism, much as the better-known CDM has done to mitigate climate change. By establishing a standard and accrediting process to certify the supply of biodiversity-protected areas and by facilitating market exchanges, a gdm would enable the sale of gdm-certified biodiversity conservation to willing buyers, including businesses and consumers.

Current thinking is that a voluntary market could deliver significant biodiversity supply for which there would be adequate voluntary demand from business, consumers and others. For example, if the top 500 companies globally were to voluntarily commit just 1/100th of 1% of their annual revenues for gdm-certified biodiversity supply, this would generate \$2.5 billion of potential demand. At some point, policy makers may decide that businesses and consumers should be obliged to pay for the biodiversity impacts of their production and consumption patterns and therefore a regulatory framework could be established to ensure adequate and appropriate levels of biodiversity demand. However, a pilot phase of a gdm could be voluntary and focus on developing the standards and certification scheme for certified supply, and in so doing, provide insights on the level and nature of demand ([www.gdm.earthmind.net](http://www.gdm.earthmind.net)).

**Mission Markets Inc.** is an example of a new company anticipating the emergence and growing importance of biodiversity and ecosystem services markets, as societal and market norms shift towards sustainability and social responsibility. As such, it has created an electronic transactions and communications platform for voluntary environmental and social capital markets. It allows the increasing number of investors focusing on Socially Responsible Investing (SRI) and sustainability to access a network through which to find, compare and assess new investments, organizations and assets. The platform not only consolidates social and environmental markets, but provides transparency and liquidity, unifying selected metrics so that visitors can compare organization and assets in creative ways, confirming the quality and credibility of transactions and the accountability of the organizations themselves ([www.missionmarkets.com](http://www.missionmarkets.com)).

**Voluntary Agriculture, Forestry & Land Use (AFOLU) Carbon Market:** Voluntary carbon offset transactions reached USD\$705 million in 2008, doubling in size from the previous year and with credit prices increasing by an average of 20%. Of this traded volume, 11% was accounted for by AFOLU projects, with potential biodiversity and poverty-reduction co-benefits, including: Afforestation/ Reforestation; Avoided Deforestation (REDD); Improved Forest Management; and Agriculture Soil Management. Interest in land-use/project based carbon credits has been driven by both actual and anticipated changes in the regulatory environment and the creation of market standards such as the Voluntary Carbon Standard (VCS) and the Climate, Community and Biodiversity Standard (CCBS). These provide assurance for both buyers and sellers, use credible carbon accounting methods, and have streamlined registration processes. The methodologies of the disparate standards do vary, however, taking different approaches to quantifying baselines, leakage, and additionality across AFOLU project types<sup>4</sup>. Current buyers include:

- Companies that have voluntarily committed to being carbon neutral;
- Companies purchasing credits to meet corporate social and environmental responsibility objectives;
- Corporate entities anticipating compliance with future regulation;
- Traders and brokers wishing to take advantage of possible future price increases; and
- Individuals offsetting their personal carbon footprints.

As quality projects are brought to market, technical expertise develops, and adequate financing is sourced, indications are that the AFOLU market will continue to grow and should remain a significant opportunity for business. With offset credits from forestry projects specifically allowed in the proposed U.S. climate legislation, it is anticipated that demand for AFOLU projects will increase over the next two to five years.

**Malaysia – Malua BioBank** is a collaborative effort of the Eco Products Fund LP, a private equity firm jointly managed by New Forests Inc and Equator Environmental LLC, and the state government of Sabah, which has given conservation rights to the Malua BioBank for a period of 50 years. The aim is to raise US\$10 million for the rehabilitation of 34,000 hectares of formerly logged forest adjacent to the Danum Valley Conservation Area. The Malua BioBank sells Biodiversity Conservation Certificates, which are each equivalent to 100 square meters of protected and restored rainforest. Certificates are currently sold at \$10 per unit (equivalent to \$1,000 per hectare), and 21,500 credits have been purchased so far by Malaysian companies. The certificates are registered in the Markit<sup>5</sup> environmental registry and can be traded or retired. Revenue generated from certificate sales is used to fund the running costs of the project and is invested in a trust fund for the conservation management of the 50-year license. Any profit beyond this will be shared between the forest management license holder (Yayasan Sabah, a foundation established by the Sabah government to improve local livelihoods) and the Malua BioBank investors ([www.maluabank.com/](http://www.maluabank.com/)).

Note that purchases of Certificates from the Malua BioBank cannot be used by companies to offset their impacts on rainforests in other locations. When purchasing certificates, the buyer contractually agrees that the certificates do not represent offsets against clearing or degrading other forests. In this respect, the Malua BioBank provides an example of a non-offsetting market and highlights developers' reputational risks and sense of environmental responsibilities as the main drivers for business to engage with ecosystem service markets.

*Sources: The Katoomba Group and New Carbon Finance (2008), Hamilton et al. (2009), Cullen and Durschinger (2008), Grippe (2008)*

### 5.3.3 ECOSYSTEM SERVICES MARKET OPPORTUNITIES FOR BUSINESS

Ecosystem service markets represent an **opportunity for businesses to reduce adverse impacts on ecosystems and biodiversity** (and potentially to have a net positive impact), with the associated benefits of meeting existing or anticipated regulatory requirements, managing environmental risks, and improving corporate environmental and social performance. Greater rewards may be gained by those companies that exceed standard expectations and offer innovation in their approaches to ecosystem service markets.

Taking a lead in ecosystem service markets may help companies improve their relationships with environmental regulators, by showing forward thinking (BSR 2006). Some of the more innovative projects in this area go beyond providing ecosystem benefits and incorporate local communities in projects, helping to reduce poverty as well. Regulators may take lessons from the experience of innovative projects, helping to close the gap between regulator expectations and business practices. This can give businesses early indications of regulator action, leading to competitive advantage.

Ecosystem service markets present an **opportunity to diversify and increase revenue** for companies either directly, through project development and the sale of credits in the market, or indirectly, by providing support services to facilitate market development and implementation. Although market prospects are difficult to predict and heavily dependent on future regulatory decisions, markets for ecosystem services are expected to grow rapidly in the coming decades (Mulder et al. 2006). For example, Forest Trends and The Katoomba Group predict that markets for water quality trading under regulatory schemes will exceed US\$500 million by 2010. Markets for biodiversity offsets are conservatively estimated to be worth \$1.8-2.9 billion today (Madsen et al. 2010) and could grow to US\$10 billion by 2020 (Carroll 2008).

At each stage in the operation of ecosystem service markets, there are cost-saving and revenue-generating opportunities for business. Table 5.3 illustrates where these opportunities may lie and the sectors to which they are most relevant.

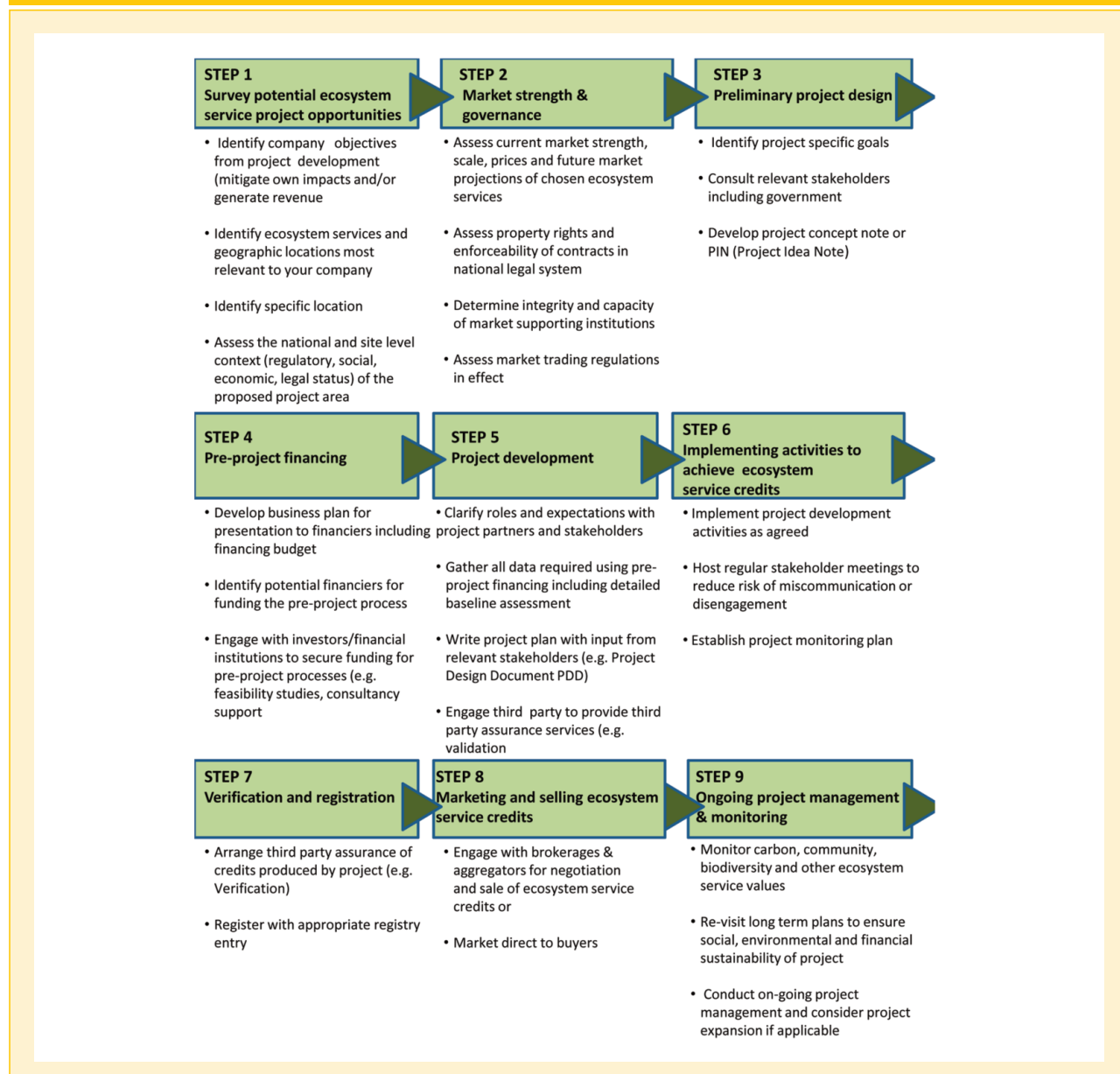
**Table 5.3 Business activities supporting ecosystem service markets**

<b>Activity</b>	<b>Role</b>	<b>Relevant business sectors</b>
<b>Finance</b>		
Project finance and banking	Providing investment capital for commercial ecosystem service projects	Investment and commercial banks, venture capital, companies seeking to offset adverse ecosystem impacts
Fund creation and management	Establishing and managing ecosystem service funds and managing fund investment profiles	Investment fund managers, fund management consultancies
Brokerage	Linking sellers and buyers and facilitating trade in ecosystem service credits	Brokers and consultancies
<b>Governance</b>		
Monitoring	Collecting and analysing ecosystem service data for accountability and to facilitate price transparency	Environmental consultancies, NGOs, research departments
Registry services	Collating and organising data on ecosystem service assets and transactions	Financial information service companies
Certification	Third-party assurance of project performance against certification standards	Environmental consultancies, NGOs, approved certification bodies
Validation and verification	Verifying project/business plans and performance against market standards	Assurance providers (accredited verifiers)
<b>Project development</b>		
Project developers	Planning, securing finance for, and managing the development of ecosystem service projects	Land-owners, land-management companies, construction and infrastructure developers, forestry and agricultural companies, environmental consultancies, private companies
Project technical support	Technical expertise and support for the design of ecosystem service projects and services	Environmental consultancies, NGOs, research departments
Market intelligence services	Provision of data on status and trends in ecosystem service markets	Specialised ecosystem market information providers, news and intelligence agencies, market exchanges, banks
Market strategy support	Interpretation of market information and advice on market strategy	Strategy consultancies, brokerages
Insurance services	Provision of financial compensation for insurable loss and reduction of project risk	Insurance companies
Legal services	Advice on project legal issues, e.g. land tenure, legal protection status, legal status of traded rights	Legal firms

Source: PricewaterhouseCoopers for TEEB

One of the main commercial opportunities in ecosystem service markets is the design, establishment, and management of ecosystem service projects or of investments in such projects. Some of the key steps in developing an ecosystem service project are outlined in Figure 5.1.

**Figure 5.1 Key steps in developing an ecosystem services project**



Source: PricewaterhouseCoopers for TEEB, building on Carter Ingram et al. (2009)

Addressing each of these steps systematically and building flexibility into ecosystem service projects during the early planning stages will help to ensure project profitability over the long term. It may be difficult to predict the timescales for some of these steps, and this should be taken into consideration during the planning process.

Ecosystem service markets differ significantly in the levels of financial investment, government regulation, and the maturity of supporting institutions. At one end of the spectrum, the U.S. wetland mitigation scheme (initiated in 1983) benefits from clear legal requirements and detailed guidance for wetland offsets in state and federal government regulations, supported by well-defined liability and enforceable property rights. Market demand for

wetland offsets comes from residential, commercial and industrial projects that impinge on wetlands. This in turn has stimulated private investment in the supply of wetland offsets and related market services. At the other end of the spectrum, the potential market for REDD credits is still awaiting development of standardised methodologies, market access agreements, support services, and well-defined and enforceable property rights in certain areas of implementation, without which there is likely to be little interest from mainstream investors.

Within the current range of ecosystem service markets, there is already a significant number of commercial opportunities. As ecosystem service markets grow, the scale and range of business opportunities is expected to increase substantially. Figure 5.2 identifies some of the key areas that can be expected to contribute to the expansion and strengthening of ecosystem service markets, once established.

**Figure 5.2 Three pillars to support the development of markets for ecosystem services**

Financial	Regulatory	Market
<ul style="list-style-type: none"> <li>Clearly defined BES credits and debits</li> <li>Insurability of BES assets</li> <li>Investor awareness and support for commercial ventures</li> <li>Competitive risk/reward profile</li> <li>Combined ecosystem, business development and financial expertise</li> </ul>	<ul style="list-style-type: none"> <li>Secure use and/or property rights over ecosystem assets and services</li> <li>Clear baselines in order to assess the 'additionality' of BES investments</li> <li>Approved standards and methods for assessing debits and credits</li> <li>Fiscal incentives (e.g., tax credits for conservation)</li> <li>Legal authority to trade ecosystem credits/debits (including internationally)</li> <li>Adequate regulatory capacity to enforce</li> </ul>	<ul style="list-style-type: none"> <li>Clearly defined asset classes</li> <li>Efficient project approval processes</li> <li>Modest transaction costs</li> <li>Widely accepted monitoring, verification and enforcement systems</li> <li>Linked registries to record transactions (especially for intangibles, e.g., offsets)</li> <li>Competitive intermediary services (e.g., brokers, validators)</li> </ul>

*Source: PricewaterhouseCoopers for TEEB*

One of the key requirements for developing ecosystem markets is the presence of well-defined and enforceable property rights<sup>6</sup>. For a project buyer, developer, or seller, there are a number of rights-related factors to consider, including the following<sup>7</sup>:

- Clear definition of the nature and extent of the property right;
- Ability to measure and verify the property right at reasonable cost;
- Ability to enforce ownership of the property right at reasonable cost;
- The value of the right and the willingness to purchase the right by other parties;
- Ability to transfer ownership of the property right at reasonable cost;
- Reliable information on the ecosystem services provided by the property; and
- Low sovereign risk, meaning that future government decisions are unlikely to significantly reduce the value of the property right.

### 5.3.4 REDD+ AND LESSONS FOR NEW ECOSYSTEM SERVICE MARKETS

Deforestation is thought to account for roughly 17% of annual global greenhouse gas emissions (IPCC 2007). Curbing deforestation appears to offer the largest, most cost-effective, and fastest means of mitigating emissions from now until 2030 (Addams et al. 2009; IAP 2009; Copenhagen Accord). Actions to do this are known as Reducing Emissions from Deforestation and Degradation (REDD), and REDD has risen quickly in priority over recent years throughout the international climate change talks (Box 5.11).

REDD projects seek to create or strengthen incentives for the protection of existing forests through actions that prevent deforestation and/or forest degradation. This may be achieved through a range of measures, with funding from the carbon market or as direct payments from governments for forest protection and management.

The proposed REDD mechanism has been expanded to REDD+, which includes not only emissions reductions from curbing deforestation, but also the conservation of carbon stocks in standing forests, enhancement of forest carbon stocks, afforestation, reforestation, and sustainable management of forests. All are potentially allowable as REDD+ projects, depending on the final agreement, which may be approved at COP16 in Mexico in December 2010 (Parker et al. 2009; Forum for the Future 2009).

#### Box 5.11 Landmarks and prospects in the development of REDD and REDD+

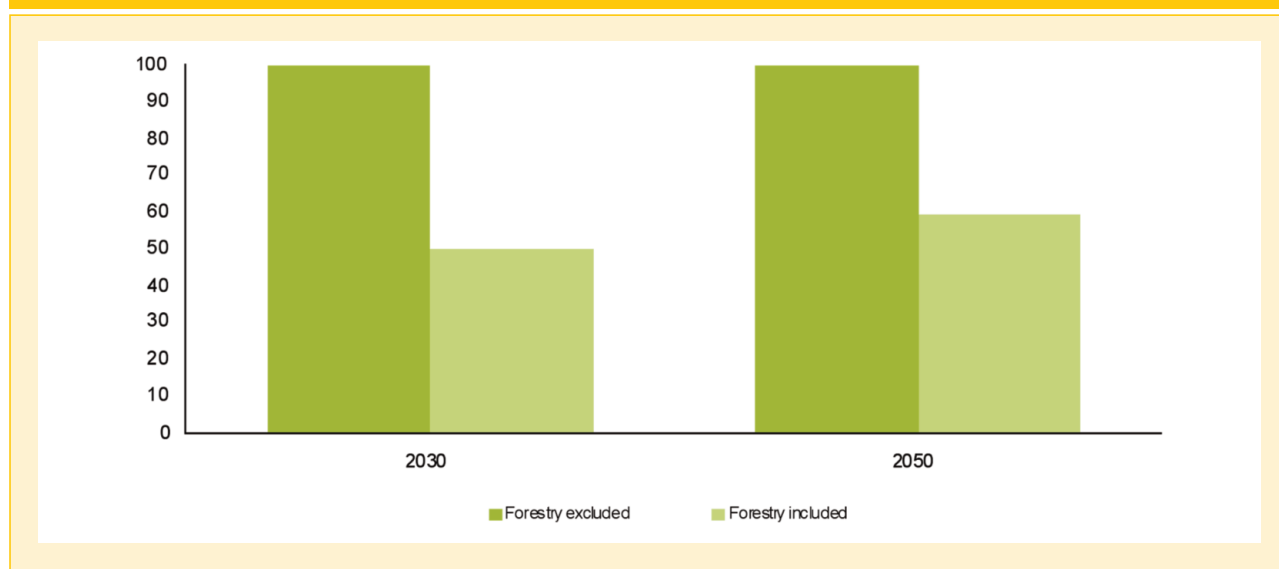
- **2005** – Proposal by governments of Costa Rica, Papua New Guinea and others for the inclusion of avoided deforestation in a post-Kyoto climate change agreement receives support from several countries at COP11 in Montreal
- **2007** – UNFCCC Parties at COP13 include reference to REDD in the Bali Action Plan and Bali Road Map for a post-Kyoto climate change framework
- **2009** – US\$4.6 billion committed to REDD projects across six international funds
- **2009** – Recognition of the role and need for a REDD finance mechanism in the COP15 Copenhagen Accord
- **2010** – REDD+ mechanism may be approved at COP 16 in Mexico
- **2011** – REDD+ mechanism may go live following ratification of the Kyoto II Agreement
- **2013** – REDD+ credits may be accepted as allowable compliance units under Phase III of the European Emissions Trading System (EU ETS)

Primary forest is, in general terms, carbon dense and biologically diverse, with tropical, temperate, and boreal forests containing about two-thirds of the world's terrestrial species. It follows that for intact forest landscapes, one of the most effective ways to conserve biodiversity is by avoiding deforestation. In the case of degraded lands, restoration by the establishment of mixed native species along with avoidance of future deforestation can yield multiple biodiversity benefits (UNEP 2008)<sup>8</sup>.

REDD+ is likely to be the first internationally coordinated, biodiversity-related market of significant size and is likely to offer many valuable lessons, including how to develop economically efficient, environmentally effective and politically acceptable markets, standards, and regulations. These lessons will be important for the establishment and growth of other ecosystem markets as well.

The Eliasch Review (2008) estimated that the funds required to halve emissions from the forest sector by 2030 could be about US\$17 – 33 billion per year, based on various estimates from the literature and from work

Figure 5.3 How REDD and forest carbon reduce the costs of climate change mitigation



Source: Eliasch (2008)

commissioned by the Review. However, the Eliasch Review also highlighted that the global economic costs of climate change caused by deforestation could reach US\$1 trillion a year by 2100. In other words, the cost of action is considerably lower than the cost of inaction.

Additionally, the Eliasch Review indicated that REDD+ (along with other forestry mechanisms) should be included in the activities undertaken to reduce greenhouse gas emissions, as this would significantly lower the overall cost of meeting the emission reduction targets currently under negotiation at the UNFCCC (Figure 5.3).

Reducing deforestation will require substantial financing. Notwithstanding early funding commitments, it is difficult to imagine the private sector funding major REDD+ projects without greater clarity on the long term policy framework and regulatory regimes, and without strengthening institutional arrangements in many of the countries where such projects are planned or required. Furthermore, issues such as 'leakage' mean that REDD+ is unlikely to be widely accepted, unless a coordinated, international effort is established.

Despite the slow pace of international climate change negotiations, many Parties to the UNFCCC are keen to demonstrate that REDD+ projects can be successfully designed and implemented. Several pilot projects have been financed either through voluntary bilateral or multi-lateral funding, or through the sale of carbon emission reduction credits in the voluntary carbon market. Analysis for TEEB by PricewaterhouseCoopers shows that, as of mid-2010, 22 operational REDD projects were publically reported, despite the lack of an international agreement on REDD. These early projects are expected to deliver around 37.5 Mt of CO<sub>2</sub>e in emission reductions over their lifetimes (typically 20 to 30 years), generating useful lessons which are likely to influence the future development of a potential 6 GtCO<sub>2</sub>e market (Forum for the Future 2009).

National governments also continue to move ahead with the design and establishment of carbon markets. Examples of evolving policy frameworks include Australia, Japan, and the USA. These, like the EU Emissions Trading Scheme (EU ETS), are part of the policy response that pass sovereign-level obligations to the private and public sectors. They are also likely to allow carbon credits generated from sub-national REDD projects for compliance purposes: REDD+ within a carbon market is therefore expected to offer a significant opportunity to the private sector.

Table 5.4 Business opportunities in REDD and forest carbon

Finance	Governance	Project development	REDD+ related opportunities	Market activity
<ul style="list-style-type: none"> <li>Equity investment and project finance – Providing upfront financing for establishment of REDD projects, underpinned by carbon revenue streams and grants as well as forest product revenues.</li> <li>Fund creation and management – Creating REDD funds and attracting investment into the fund on a for-profit or not-for-profit basis. Managing the applications, investments, and monitoring of recipient REDD projects.</li> </ul>	<ul style="list-style-type: none"> <li>Registry services – Systems to trade and trace carbon credits generated by projects.</li> <li>Capacity building for REDD market participants – Provision of training and management support for government, civil society organisations and the private sector actors involved in the REDD market.</li> <li>Validation and verification services – Validation and verification of a project's carbon, biodiversity, ecosystem service, community and if relevant, REDD+ performance according to selected standards.</li> </ul>	<ul style="list-style-type: none"> <li>Project development – Planning, securing finance for and managing the development of REDD projects.</li> <li>Project technical support – Technical expertise and support for the design of REDD activities. Creation of technological products to support project design and monitoring e.g. GIS hardware.</li> <li>Monitoring – Collecting and assessing carbon, biodiversity, ecosystem service, community and other relevant performance data for accountability purposes.</li> <li>Legal services – Advice on contracts (e.g. land ownership).</li> <li>Insurance services – Providing insurance products against risks to reduce risks for REDD activities.</li> <li>Financial advice – Providing advice on project structuring, tax structuring, finance raising and carbon transactions.</li> </ul>	<ul style="list-style-type: none"> <li>Improving efficiency of forestry operations and energy usage – Investment in and development to reduce carbon emissions from forestry operations.</li> <li>Certified sustainable forest products – Production and sale of certified sustainable forest products.</li> <li>Improved agriculture and livestock technologies – Developing or investing in products and services to support efficiency improvements in the livestock and agriculture sectors.</li> <li>Fuel efficiency &amp; clean energy – Developing or investing in products and services to support improvements in fuel and energy efficiency for forestry operations.</li> <li>Education &amp; training – Developing education &amp; training programmes, tools, facilities and support services.</li> <li>Ecotourism – Development of low impact tourism projects in or around REDD project area.</li> </ul>	<ul style="list-style-type: none"> <li>Secondary trading of REDD credits – Purchase and sale of REDD credits on the carbon market for profit. Providing liquidity to a market.</li> <li>Brokerage - Linking sellers and buyers and facilitating REDD credit transactions.</li> <li>Project aggregation – Generating portfolios of multiple REDD projects through purchasing in the primary market.</li> <li>Market intelligence services – Provision of data on of REDD market.</li> <li>Market technical support – Interpretation of market information and giving advice on marketing/sales strategy.</li> </ul>

Source: PricewaterhouseCoopers for TEEB (4th column adapted from Forum for the Future, 2009)

The current immaturity and potential future scale of the REDD+ market presents major opportunities for a variety of businesses, particularly if and when sub-national REDD+ projects are allowed to sell credits in regulated carbon markets (as opposed to REDD+ activities that are directly funded by governments and linked to performance at national level). As in other markets, it seems likely that early movers willing to take the risks will reap the greatest rewards. Table 5.4 illustrates the areas in which a range of business opportunities may arise within the different components of a REDD+ market.

While REDD+ could deliver significant climate and biodiversity benefits, it is clear that some industrial sectors may be negatively affected if deforestation is significantly reduced. This will be particularly acute for those businesses that rely on access to rural land, such as agriculture or Forest, Paper & Packaging (FPP). These industries could see increased competition for natural forest and other lands from carbon developers seeking to establish REDD+ projects. This could result in higher land prices, limit the land area available for timber harvesting and increase operational costs. Such impacts may be offset to some extent by companies through active participation in the REDD+ market. For example, FPP companies may afforest or reforest land and implement sustainable forest management systems for the purposes of forest carbon stock enhancement and generate revenue through the sale of carbon offset credits, alongside pulp and paper products<sup>9</sup>.

Regulatory uncertainties aside, the potential benefits of REDD+ in both the short and long-term have led some businesses to take the plunge. Box 5.12 describes how a large international hotel chain is seeking to offset its greenhouse gas emissions by funding a REDD scheme in the Brazilian Amazon.

#### Box 5.12 Marriott invests in REDD: The Juma Sustainable Development Reserve

In Brazil, the Marriott international hotel group has dedicated US\$2 million towards a fund administered by the Amazonas Sustainable Foundation which protects 590,000 hectares of threatened rainforest in the Juma Sustainable Development Reserve. The hotel group is investing in this project to offset its own estimated carbon footprint of 3 million metric tons of CO<sub>2</sub> per year.

The Juma project provides incentives for local communities to protect the forest by distributing payments through the 'Bolsa Floresta' programmes, including 'Bolsa Floresta Family', 'Bolsa Floresta Social', 'Bolsa Floresta Association' and 'Bolsa Floresta Sustainable Income Generation'. For example, the Bolsa Floresta Family programme provides a value card for each local family which can be credited with up to 50 Reais (around US\$25) each month, depending on forest protection performance. Investments in the project are also used to fund research and conservation work in the reserve as well as supporting various local economic initiatives. According to the project's own calculations, it will avoid deforestation of 330,000 ha of natural rainforest by 2050, generating a carbon credit of approximately 189 million tons. The reputational boost from the group's investment in the Juma project is significant; for example, the initiative has helped Marriott win numerous sustainability awards including the World Travel and Tourism Council's 2009 'Tourism for Tomorrow Award for Sustainability'. It is hoped that the initiative may increase the group's position in the sustainable tourism market.

Sources: <http://www.forestcarbonportal.com>; <http://www.marriott.co.uk>; Forum For The Future (2009), and PricewaterhouseCoopers for TEEB

# 5.4 TOOLS TO SUPPORT MARKETS FOR BIODIVERSITY AND ECOSYSTEM SERVICES

Biodiversity business opportunities are supported by an increasingly robust collection of market-based tools which enable companies to adopt biodiversity-responsible practices and indeed to develop and market biodiversity-based goods and services. Such market-based tools compliment the policy instruments for biodiversity which are extensively reviewed in the TEEB report for policy makers (TEEB 2009). This section highlights a selection of market-based tools for biodiversity business, including those related to responsible investment, responsible production, and responsible reporting.

For the investment community, one key mechanism for integrating biodiversity into decision-making is Performance Standard 6 on Biodiversity Conservation and Sustainable Natural Resource Management, developed by the International Finance Corporation (IFC). This standard, together with all of the IFC's environmental and social standards, not only guides the investments of the IFC – the private sector arm of the World Bank – but it also influences the investment practices of more than 60 multi-national banks that have adopted the Equator Principles (TEEB 2009). These Principles call for adherence to IFC Performance Standards with respect to project financing in excess of \$10 million in emerging markets. The IFC's Performance Standards are currently under revision and the next iteration of Performance Standard 6, in particular, will provide an even more robust approach to addressing biodiversity issues in investment decisions<sup>10</sup>.

## 5.4.1 CERTIFICATION SCHEMES FOR BIODIVERSITY AND ECOSYSTEM SERVICE MARKETS

Growing consumer environmental concerns have stimulated markets for products and production practices that conserve biodiversity, as noted in Chapter 1. These markets are supported by a range of certification schemes that verify the environmental claims of companies with respect to their products and practices. Although few of the existing social and environmental certification schemes focus on biodiversity, most address some aspects of the biodiversity challenge.

For example, in the coffee sector, one can find schemes that emphasize landscape or ecosystem protection, such as Rainforest Alliance certification, others that promote environment-friendly farming practices (e.g., organic agriculture), and still others that emphasize social equity in the use of biological resources (e.g., FairTrade certification). Taken as a whole, these certification schemes contribute to biodiversity-responsible business practices. A few of them, however, are particularly noteworthy in terms of their contributions to biodiversity conservation at the landscape and ecosystem level; these are highlighted below:

**Rainforest Alliance** certification is a comprehensive process that promotes and guarantees improvements in agriculture and forestry. Their independent seal of approval, one of the most widely-recognized and ubiquitous in the growing 'sustainable marketplace', ensures that the goods and services it approves were produced "in compliance with strict guidelines for protecting the environment, wildlife, workers and local communities" ([www.rainforest-alliance.org](http://www.rainforest-alliance.org))<sup>11</sup>.

The **Marine Aquarium Council (MAC)** brings together fisheries and organizations that collect, produce and handle marine aquarium organisms around the world, committing its members to work towards compliance with a shared set of standards. The MAC vision is to certify the entire supply chain, starting with sustainable and responsible management of the marine site, from which fish and marine organisms are harvested.

Its core Ecosystem Fishery Management Standard includes the commitment: “To verify that the collection area is managed according to principles of ecosystem management in order to ensure ecosystem integrity and the sustainable use of the marine aquarium fishery” .

In addition, there are attempts to assess or certify the biodiversity performance of individual companies. One of the more promising initiatives, coming out of Brazil and gaining international prominence, is the **LIFE Institute**. They have created and are responsible for managing LIFE Certification, which qualifies and recognizes public and private organizations that promote biodiversity conservation and sustainable development initiatives, thus ensuring the protection of ecosystem integrity .

Each of these certification schemes provides structures, standards and certification processes that can help companies verify their biodiversity responsibility to the market. Such certifications can help companies penetrate new, more discerning markets and also make them more attractive to the growing number of responsible consumers and investors.

#### 5.4.2 ASSESSMENT AND REPORTING FOR BIODIVERSITY AND ECOSYSTEM SERVICE MARKETS

As companies begin to address biodiversity more strategically in their planning and decision-making, new tools for assessing and reporting on biodiversity are needed, as discussed in Chapter 3. Below we highlight three examples that show how such tools can help companies realize new biodiversity business opportunities:

The **Corporate Ecosystem Services Review (ESR)** includes a wealth of supporting tools and training materials to assist companies in coming to grips with the biodiversity aspects of their operations. For example, Mondi “used the ESR to develop several new strategies for dealing with the ecosystem service challenges to their FSC certified South African plantations” while Syngenta used the ESR to “identify a number of possible opportunities to help farmers either reduce their impacts on ecosystems or adapt to ecosystem change”.

The **Global Reporting Initiative (GRI) Biodiversity Reporting Resource** was released in 2007 to assist companies in reporting their biodiversity performance. As the tool explains: “Reporting offers organizations an

##### Box 5.13 The association for social and environmental standards

ISEAL is the global association for social and environmental standards and has become an umbrella organization for a growing number of sustainability standards and certification schemes. ISEAL members include Fairtrade Labelling Organizations International (FLO), Forest Stewardship Council (FSC), International Federation of Organic Agriculture Movements (IFOAM), International Organic Accreditation Service (IOAS), Marine Aquarium Council (MAC), Marine Stewardship Council (MSC), Rainforest Alliance, and Social Accountability International (SAI). One of the key roles of ISEAL is to harmonize the ways that different sustainability standards are administered, verified and assessed.

To this end, in 2010 ISEAL is launching a new “Verification Code of Good Practice for Assessing the Impacts of Standards Systems”. This aims to define good operating practices in terms of accreditation, certification and auditing of entities to social and environmental standards, and also to create a requirement for all credible standards systems to measure and demonstrate their contributions to social and environmental impacts using consistent methodologies. A focus of the Code will be to achieve a balance between ensuring that certification is rigorous, in terms of meeting the needs of consumers, but also accessible, by ensuring that smaller enterprises can afford to enter certification programmes and see them as market enablers rather than barriers.

Source: <http://www.isealliance.org/>

opportunity to explain their relationship with biodiversity. In what way does the organization respond to negative impacts on biodiversity deriving from its activities? What are positive impacts?”

The **Natural Value Initiative (NVI)** is a recent development that helps the finance sector evaluate and assess how companies – particularly in the food, beverage and tobacco (FBT) sectors – are managing their biodiversity opportunities and risks ([www.naturalvalueinitiative.org](http://www.naturalvalueinitiative.org)). It includes the Ecosystem Services Benchmark (ESB), which is somewhat akin to the ESR noted above. The ESB has been tested on over 30 FBT companies that are particularly dependent on biodiversity and can therefore have significant impacts on mitigating biodiversity loss.

### 5.4.3 VOLUNTARY INCENTIVES FOR BIODIVERSITY BUSINESS

As discussed in the TEEB report for national and international policy makers, incentive measures for biodiversity and ecosystem services can be greatly strengthened through appropriate government policies and regulatory frameworks. However, in addition to these policy tools, there are several types of voluntary incentives which can encourage and enable biodiversity business. These include the following:

- **Awareness raising initiatives**, which can change perceptions of investors, managers, employees or consumers about biodiversity
- **Voluntary biodiversity offsets**, which are conservation measures that can compensate for the residual, unavoidable harm to biodiversity caused by development projects
- **Biotrade arrangements**, which have promoted the collection, production, transformation, and commercialisation of goods and services derived from native biodiversity under criteria of environmental, social and economic sustainability
- **Bioprospecting arrangements and Access and Benefit Sharing agreements**, which have funded biological research and discovery partnerships between pharmaceutical companies and countries with high levels of biodiversity
- **Stewardship payments**, which pay landscape managers to deliver biodiversity conservation and provide environmental services that benefit the public
- **Conservation auctions**, which can be used to deliver stewardship payments
- **Conservation covenants** as part of voluntary land transactions, to embed biodiversity conservation in the title deed
- **Payments for watershed protection**, which range from payments by private water users to environmental agencies and NGOs, to direct payments by central governments to private landowners, and can be a cost-effective means of providing reliable supplies of fresh water
- **Public-private partnerships**, which explore business opportunities for safeguarding biodiversity, and can link commercial debt finance with public subsidies to produce social, commercial and biodiversity benefits

In this respect, biodiversity leaders within the private sector as well as the non-profit sector are developing new means to stimulate business engagement in the conservation and sustainable use of biodiversity and ecosystem services.

#### 5.4.4 FURTHER CONSIDERATIONS FOR INSTITUTIONAL INVESTORS

At present, institutional investors generally have little understanding of, and see little value in, biodiversity and ecosystem services. This could change, however, into a situation in which biodiversity and ecosystem services are valued by markets, causing capital inflows to companies that will benefit from new opportunities as well as capital outflows from companies that are seen to use biodiversity and ecosystem services unsustainably.

F&C, an asset manager, identified the following policy characteristics as relevant to the development of biodiversity and ecosystem services trading and markets (F&C 2010):

- In order to reduce investment risk, investors need a level of certainty about the fundamental nature of a new market – this is likely to require government intervention and regulation.
- Investors are wary of subsidies that may be subject to swift changes due to political pressure – such as the EU subsidies for biofuels.
- Landowners and those who grant permits for development could create rapid changes in the effectiveness of biodiversity management by linking development permit awards to good environmental management.
- All ecosystems services cannot be traded with ease and so it will be necessary to focus on a restricted number that can familiarise investors and markets with the concepts and allow an understanding of the risks and opportunities. The importance of building knowledge and trust amongst investors cannot be overstated; excessively complex or rushed schemes are likely to fail.
- Changes should not unfairly disadvantage companies based in particular countries – for example, increasing the costs of access to land for a mining company should apply equally to all such companies, whatever their domicile.
- Data provision is crucial to good investment decisions, and also to good public policy decisions.
- Cost-effective metrics and valuation methodologies are needed for example to value the ecosystem services delivered by forests in monetary terms, or to assess ecosystem service debits and credits in bio-physical terms.

If public policies intended to encourage biodiversity business are to attract significant support from institutional investors, concerns such as these will need to be addressed comprehensively.

#### 5.4.5 PUBLIC POLICY TO SUPPORT BIODIVERSITY BUSINESS

The TEEB report for policy makers includes a detailed review of various policies that could be implemented at the national and international levels to reduce the loss of biodiversity. Some of these would clearly create an enabling framework to scale up new biodiversity and ecosystem services business opportunities, notably those recommended in Chapter 5 of the report, entitled ‘Rewarding benefits through payments and markets’ (TEEB 2009). These include the following:

- **“Promote PES demonstration activities and capacity building to develop the knowledge base, reduce transaction costs and scale up successful initiatives.** Further efforts are needed to confirm where, in what form and under what conditions PES work best for biodiversity, and to improve their targeting, monitoring and

governance... Spatial analyses – including data on economic costs and benefits – can help to map areas that are most important for providing ecosystem services, as well as the distribution of providers and beneficiaries, in order to identify synergies and priorities for both policymakers and private investors.”

- **“Support an international agreement on a REDD+ mechanism as part of the global climate regime, while ensuring that other ecosystem services besides climate mitigation are taken into account.** Depending on how REDD+ is designed and implemented, it could not only provide incentives for reducing emissions from deforestation and degradation but also secure biodiversity and other benefits at international, national and local levels.”
- **“Contribute to emerging international initiatives to support direct investment in biodiversity public goods and natural capital** across a wider array of ecosystems, such as the proposed Green Development Mechanism (GDM).”
- **“Successfully conclude negotiations under the CBD on the international regime for more efficient and equitable sharing of the benefits arising out of the utilisation of genetic resources.** A premium is needed for traditional local knowledge that leads to successful commercialisation based on genetic resources, together with better screening and contractual and dispute resolution procedures to minimise transaction costs.”
- **“Make more systematic use of opportunities to provide tax exemptions for activities that integrate ecological concerns and promote conservation.** Tax breaks can provide powerful incentives for private actors to donate land or to engage in long-term stewardship agreements.”
- **“Help producers prepare for new market opportunities as consumers and public procurement policies stimulate demand for biodiversity and ecosystem services-friendly products and services.** Policymakers can support the development of robust process and performance standards and verification systems that explicitly include biodiversity and ecosystem services biodiversity and ecosystem services conservation... Public business advisory and support programmes should be geared to help companies meet the needs of new markets for green products and services.”
- **“Cooperative measures should be put in place to support developing countries’ production and export sectors, to enable them to participate effectively in the development and implementation of new market standards.** Targeted support of this kind can be an important part of international development aid, offering synergies between biodiversity and ecosystem services, development and poverty reduction.”

Such policy developments would reinforce the voluntary tools and incentives outlined above. In order to ensure synergies between private initiatives and public policies, however, it is essential to engage business in the development of biodiversity policies at both the national and international levels.

# 5.5 WHAT IS TO BE DONE?

New approaches to integrating biodiversity into existing ‘mainstream’ businesses, the emergence of new biodiversity businesses, the development of new and innovative markets for biodiversity and ecosystem services – this chapter has sought to show that biodiversity and ecosystem services are much more than a business risk but can and are increasingly the basis for profitable business opportunities.

A business approach to biodiversity and ecosystem services can deliver net positive biodiversity impacts, as well as net positive financial returns. As suggested by the following table, adapted from the Ecosystem Marketplace, biodiversity and ecosystem services are likely to provide lucrative business opportunities in the years ahead.

**Table 5.5 Biodiversity and ecosystem service market opportunities**

Biodiversity and ecosystem service market opportunities	Market size (US\$ per annum)		
	2008 (actual)	2020 (est.)	2050 (est.)
<b>Certified agricultural products</b> (e.g., organic, fair-trade)	\$40billion (2.5% of global food and beverage market)	\$210 billion	\$900 billion
<b>Certified forest products</b>	\$5 billion of FSC-certified products	\$15 billion	\$50 billion
<b>Forest-based carbon offsets in regulated markets</b> (e.g. CDM, REDD+)	Various pilots (e.g. New South Wales GHG Abatement Scheme): \$0.5 million	\$5 billion	\$5 billion
<b>Forest-based carbon offsets in voluntary markets</b> (e.g. VCS)	\$21 million in 2006	\$5 billion	\$5 billion
<b>Payments for ecosystem services mediated by government</b>	\$3 billion	\$7 billion	\$15 billion
<b>Government payments for water-related ecosystem services</b>	\$5.2 billion	\$6 billion	\$20 billion
<b>Voluntary payments for watershed management</b>	Various pilots such as in Costa Rica, Ecuador, etc: \$5 million	\$2 billion	\$10 billion
<b>Biodiversity offsets in regulated markets</b> (e.g. US wetland banking)	\$3.4 billion	\$10 billion	\$20 billion
<b>Voluntary biodiversity offsets</b>	\$17 million	\$100 million	\$400 million
<b>Bio-prospecting agreements</b>	\$30 million	\$100 million	\$500 million
<b>Land trusts, easements and other fiscal incentives for conservation</b> (e.g. TNC programmes in North America and Australia)	\$8 billion in U.S. alone	\$20 billion	Difficult to predict

Adapted from: [http://moderncms.ecosystemmarketplace.com/repository/moderncms\\_documents/PES\\_MATRIX\\_06-16-08\\_oriented.1.pdf](http://moderncms.ecosystemmarketplace.com/repository/moderncms_documents/PES_MATRIX_06-16-08_oriented.1.pdf)

From a business perspective, the reasons and opportunities to invest in biodiversity and ecosystems are increasingly compelling. These opportunities are most evident in cases where business profitability depends directly on the quality and quantity of ecosystem services – in ecotourism ventures, for instance – but also for businesses that rely on natural resources like wood, water, fibre, fish and wild genetic material. Biodiversity business opportunities can be found in a surprisingly wide range of sectors, including mining, energy, agriculture, fisheries, construction, forestry, tourism, pharmaceuticals, cosmetics, banking and even fashion.

So what is to be done? Why do we not see more significant investment by the private sector in biodiversity conservation? Why do we not see a surge in the growth of new biodiversity businesses across a range of sectors from agriculture to banking to tourism? If ecosystem services are as important to life on this planet as scientists tell us they are, why do we not see a rapid expansion in both domestic and international markets for ecosystem services?

Perhaps we need more market-based tools, but more importantly, perhaps we need more faith in the potential of business to conserve biodiversity and restore ecosystems. In practice, this means assigning greater responsibility but also increased access and influence for business in how biodiversity assets are managed. In almost every country in the world today, major biodiversity assets are either directly owned or controlled by governments – including mountains, forests, grasslands, wetlands, lakes and rivers, coastal areas, and, exclusive economic zones in the seas. In short, if we really want to harness the power of business to help stop the loss of biodiversity and to restore degraded landscapes and ecosystems, we will need to rethink the way that society manages natural capital and biodiversity assets.

Importantly, increased private sector access to biodiversity assets will only deliver sustainable results if it is bundled with an appropriate set of rights and responsibilities. Where access to natural assets remains wide open – notably in the high seas and their fisheries – it is clear from experience that business on its own is not able to deliver biodiversity conservation and sustainable resource management. Of course, government subsidies to the fishing industry, as highlighted in the TEEB report for policy makers, do not help this situation.

If we are serious about upscaling biodiversity opportunities for business, what needs to be done is to empower businesses to responsibly manage key biodiversity assets so that they are conserved, used sustainably and equitably, and when necessary, restored. This requires a serious commitment to rethinking the way we manage nature in order to make capitalism work for conservation.

## Endnotes

<sup>1</sup> IFOAM (The International Federation of Organic Agricultural Movements) explains: "Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved." See: [http://www.ifoam.org/press/press/2008/20080522\\_Press\\_Release\\_Organic\\_Agriculture\\_for\\_Biodiversity.php](http://www.ifoam.org/press/press/2008/20080522_Press_Release_Organic_Agriculture_for_Biodiversity.php)

<sup>2</sup> A recent survey by UEBT (Union for Ethical BioTrade) indicated a significant level of consumer interest in biodiversity and ecosystem services responsibility in this sector. See: [http://uebt.ch/conferences/dl/UEBT\\_BIODIVERSITY\\_BAROMETER\\_web280410.pdf](http://uebt.ch/conferences/dl/UEBT_BIODIVERSITY_BAROMETER_web280410.pdf)

<sup>3</sup> One company claims that the development of land in Louisiana into a wetland bank means that it will be able to sell acre/credits for \$20,000 - \$25,000 each. On this basis, the company may generate \$150 million from its 7100 acre wetland bank selling credits to developers (WRI, 2008).

<sup>4</sup> Leakage occurs when reducing deforestation in one area simply results in higher deforestation elsewhere. Projects provide 'additionality' only where they have additional forest protection, afforestation or reforestation benefits above and beyond what would happen in their absence (the baseline scenario).

<sup>5</sup> Markit is an environmental commodities markets infrastructure provider.

<sup>6</sup> Property rights can be defined as a 'claim to a benefit (or income) stream that the State will agree to protect through the assignment of duty to others who may covet, or somehow interfere with, the benefit stream' (Bromley 1991). For business, the protection of this claim to environmental service benefit (or income) streams is fundamental to engaging in ecosystem service markets (Adger and Luttrell, 2000; Bayon 2004).

<sup>7</sup> It is important to understand that these factors will differ according to the ecosystem service and the country in which the investment is being made and should be considered as part of a standard risk assessment process.

<sup>8</sup> If REDD activities are concentrated in areas of both high carbon stocks and high biodiversity values then it will simultaneously help to meet the carbon reduction objectives of the UNFCCC and also the biodiversity conservation objectives of the Convention on Biological Diversity (UNEP, 2008).

<sup>9</sup> Fiscal incentives to restore this land by shifting perverse incentives supporting biodiversity destruction are needed. In some countries, this could offer a major opportunity for business and REDD financing. Safeguards are needed for poor communities who own or use these lands.

<sup>10</sup> The 14 April 2010 draft states the following: "Performance Standard 6 recognizes that protecting and conserving biodiversity, the maintenance of ecosystem services, and the sustainable management of natural resources are fundamental to sustainable development... This Performance Standard reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the use of renewable natural resources in a sustainable manner. This Performance Standard addresses how clients can avoid, reduce, restore, and offset impacts on biodiversity arising from their operations as well as sustainably manage renewable natural resources and ecosystem services." See: <http://www.ifc.org/ifcext/policyreview.nsf/Content/Performance-Standard6>.

<sup>11</sup> For example, the two critical criteria with respect to ecosystems conservation in their standard for sustainable agriculture are as follows (See [http://www.rainforest-alliance.org/agriculture/documents/sust\\_ag\\_standard.pdf](http://www.rainforest-alliance.org/agriculture/documents/sust_ag_standard.pdf)):

'2.1 Critical Criterion. All existing natural ecosystems, both aquatic and terrestrial, must be identified, protected and restored through a conservation program. The program must include the restoration of natural ecosystems or the reforestation of areas within the farm that are unsuitable for agriculture.'

'2.2 Critical Criterion. The farm must maintain the integrity of aquatic or terrestrial ecosystems inside and outside of the farm, and must not permit their destruction or alteration'

## References

- Addams, L. Boccaletti, G. Kerlin, M. and Stuchtey, M. (2009) Charting Our Water Future: Economic frameworks to inform decision-making. 2030 Water Resources Group, McKinsey & Company. URL: [http://www.mckinsey.com/client-service/water/charting\\_our\\_water\\_future.aspx](http://www.mckinsey.com/client-service/water/charting_our_water_future.aspx)
- Adger, W.N. and Luttrell C., (2000) 'Property rights and the utilisation of wetlands'. *Ecological Economics*, 35 (1), pp. 75-89.
- Barber, T. and Krivoslykova M., (2006) Global Market Assessment for Handicrafts, USAID, Volume 1 (final draft).
- Bayon, R. (2004) 'Making Environmental Markets Work: Lessons from Early Experience with Sulfur, Carbon, Wetlands and Other Related Markets', presented at Katoomba Group meeting, Lucarno, Switzerland.
- Bayon, R. Carroll, N. Hawn, A. Kenny, A. Walker, C. Bruggeman, D. Campbell, E. Ferguson, A. and Fleischer, D., (2006) Banking on Conservation: Species and Wetland Mitigation Banking. The Katoomba Group's Ecosystem Marketplace. URL: [http://moderncms.ecosystemmarketplace.com/repository/moderncms\\_documents/market\\_insights\\_banking\\_on\\_mitigation.1.pdf](http://moderncms.ecosystemmarketplace.com/repository/moderncms_documents/market_insights_banking_on_mitigation.1.pdf)
- Bernick, L. and Guth, J (2010) "Retail: Stocking the Shelves with Green". GreenBiz Reports, Five Winds International (March).
- BioFach (2009a) "Weleda on the road to success", BioFach – Vivanes Newsletter N° 203 (7 August 2009).
- BioFach (2009b) "Natural cosmetic growing against the trend", BioFach – Vivanes Newsletter N° 204 (21 September).
- Bishop, J., Kapila, S., Hicks, F., Mitchell, P. and Vorhies, F. (2008) Building Biodiversity Business. Shell International Limited and the International Union for Conservation of Nature: London, UK, and Gland, Switzerland. 164 pp. (March) URL: <http://data.iucn.org/dbtw-wpd/edocs/2008-002.pdf>
- Bromley, D. W. (1991) *Environment and Economy: Property Rights and Public Policy*, Oxford: Basil Blackwell.
- Business for Social Responsibility (BSR) (2006) *Environmental Markets: Opportunities and Risks for Business*. (Online) URL: [www.bsr.org/reports/BSR\\_Environmental-Markets.pdf](http://www.bsr.org/reports/BSR_Environmental-Markets.pdf)
- Campbell K. T. Crosbie, L. Howard, R. Mitchell, A. and Ripley, S., (2010) *The Forest Footprint Disclosure Annual Review 2009*, The Global Canopy Programme, Oxford. URL: [http://www.forest-disclosure.com/docs/FFD\\_Annual\\_Review\\_WEB.pdf](http://www.forest-disclosure.com/docs/FFD_Annual_Review_WEB.pdf)
- Carbon Disclosure Project (CDP) (2010) *Becoming a Signatory or Founding Signatory Member*. URL: [https://www.cdproject.net/SiteCollectionDocuments/CDP\\_WD\\_Signatory\\_Brochure\\_2010.pdf](https://www.cdproject.net/SiteCollectionDocuments/CDP_WD_Signatory_Brochure_2010.pdf)
- Carroll, N. (2008) 'Compliant Biodiversity Offsets' in *Payments for Ecosystems Services: Market Profiles*. Forest Trends and The Ecosystem Marketplace.
- Carter, I. J., Stevens, T. Clements, T. Hatchwell, M. Krueger, L. Victurine, R. Holmes, C. and Wilkie, D., (2009) *WCS REDD Project Development Guide*, USAID. URL: [http://www.translinks.org/Docustore/tabid/409/language/en-GB/Default.aspx?Command=Core\\_Download&EntryId=3646](http://www.translinks.org/Docustore/tabid/409/language/en-GB/Default.aspx?Command=Core_Download&EntryId=3646)
- CBI (Centre for the Promotion of Imports from developing countries) (2004) *European buyers' requirements: Benchmarking the tourism industry* (September).
- CBI (2008) *The Outerwear market in the EU*. Prepared by Fashion Research & Trends (September).
- CBI (2009a) *Long Haul Tourism: The EU market for adventure travel* (March).
- CBI (2009b) *Luggage and (leather) accessories - CBI Market Survey: The EU Market for wallets and purses* (April).
- CBI (2009c) *European buyer requirements: Tourism* (June).
- Clean Edge (2009) *Clean Energy Trends 2009*. (March) URL: <http://www.cleanege.com/reports/pdf/Trends2009.pdf>
- Connor, M., (2010) "Survey: U.S. Consumers Willing to Pay for Corporate Responsibility", *Business Ethics, the Magazine of Corporate Responsibility* (29 March) URL: <http://business-ethics.com/2010/03/29/1146-survey-u-s-consumers-willing-to-pay-for-corporate-responsibility/>
- Cullen, M.A and Durschinger, L.L. (2008) *Emerging market for land-use carbon credits*. ITTO Tropical Forest Update 18/3. URL: [http://www.itto.int/direct/topics/topics\\_pdf\\_download/topics\\_id=1881&no=0](http://www.itto.int/direct/topics/topics_pdf_download/topics_id=1881&no=0)
- Ecosystem Services Project (2008) *The Markets For Ecosystem Services Project: Factsheet*. URL: [www.ecosystems-services-project.org/html/publications/docs/facts/Markets\\_Flyer2\\_web.pdf](http://www.ecosystems-services-project.org/html/publications/docs/facts/Markets_Flyer2_web.pdf)
- Eliasch, J., (2008) *Climate Change: financing global forests: the Eliasch review*. London; Sterling, Earthscan.
- Evison, W. and Knight, C., (2010) *Biodiversity and business risk: A Global Risks Network briefing*. World Economic Forum (WEF), Geneva. URL: <http://www.weforum.org/pdf/globalrisk/Biodiversityandbusinessrisk.pdf>
- Fair Trade in Tourism South Africa (FTTSA) (2009) pers. comm.
- FiBL and IFOAM (2009) *The World of Organic Agriculture. Statistics and Emerging Trends 2009*. Bonn, Frick, Geneva.
- Fischer, C. (2003) *Combining Rate-Based and Cap-and-Trade Emissions Policies*. Discussion Paper Resources for the Future. URL: [www.rff.org/Documents/RFF-DP-03-32.pdf](http://www.rff.org/Documents/RFF-DP-03-32.pdf)
- FLO (Fair Trade Labelling Organisation) (2010) *Facts and figures web page*. URL: [http://www.fairtrade.net/facts\\_and\\_figures.html](http://www.fairtrade.net/facts_and_figures.html)

- Forest Trends & The Katoomba Group, 2008. Payments for Ecosystem Services: Market Profiles.
- Forum For The Future, 2009. Forest Investment Review. URL: <http://www.forumforthefuture.org/projects/forest-investment-review>
- GRI (Global Reporting Initiative) (2007) Biodiversity: a GRI Reporting Resource. URL: <http://www.globalreporting.org/NR/rdonlyres/07301B96-DCF0-48D3-8F85-8B638C045D6B/0/BiodiversityResourceDocument.pdf> (last access 289 June 2010).
- Gripne, S., (2008) 'Markets for Biodiversity: Delivering returns from emerging environmental markets.' PERC Reports: Volume 26, No.4, December 2008.
- Hamilton, K. Sjardin, M. Shapiro, A. and Marcello T., (2009) Fortifying the Foundation: State of the Voluntary Carbon Markets 2009. The Katoomba Group and New Carbon Finance.
- HSBC (2009) Climate Change Index annual review, (September).
- Inauen, C., (2010a) Presentation: 'Promoting biodiversity through sustainable cocoa sourcing – Experiences from a pilot project in Honduras.'
- IAP (Interacademy Panel on International Issues) (2009) 'IAP Statement on tropical forests and climate change'. URL: [http://www.interacademies.net/Object.File/Master/10/070/Statement\\_DES1748\\_IAP%20forests\\_11.09\\_P-2-1.pdf](http://www.interacademies.net/Object.File/Master/10/070/Statement_DES1748_IAP%20forests_11.09_P-2-1.pdf)
- Inauen, C., (2010b) Pers. Comm.
- Instituto LIFE, 2009. Regulations for LIFE certification (preliminary version, July). URL: [http://institutolife.org/interface/public/images/en/downloads/LIFE\\_Regulations\\_7-17-2009.pdf](http://institutolife.org/interface/public/images/en/downloads/LIFE_Regulations_7-17-2009.pdf) (last access 9 July 2010).
- IPCC (Intergovernmental Panel on Climate Change) Fourth Assessment Report: Climate Change 2007. URL: [http://www.ipcc.ch/publications\\_and\\_data/publications\\_and\\_data\\_reports.htm](http://www.ipcc.ch/publications_and_data/publications_and_data_reports.htm)
- Kline & Company (2009) Natural personal care products: will the growth continue? Presentation made at the 2009 edition of the In-Cosmetics trade fair (April).
- Madsen, B. Carroll, N and K.M., (2010) State of Biodiversity Markets. URL: <http://www.ecosystemmarketplace.com/documents/acrobat/sbdrm.pdf>
- MAC (Marine Aquarium Council) (2001) Core Ecosystem and Fishery Management International Performance Standard for the Marine Aquarium Trade (Issue 1 - July) URL: [http://aquariumcouncil.org/materials/mac\\_efm\\_standard.pdf](http://aquariumcouncil.org/materials/mac_efm_standard.pdf) (last access 9 July 2010).
- Mazzanti, R and Zavettieri, S., (2009) Summer 2010 Trends: Mysty, mimetic hues and weatherproof materials. Fiera de Milano Press Office, Milan (16 September). URL: [www.mipel.com/files/comstampa96mipel\\_eng.pdf](http://www.mipel.com/files/comstampa96mipel_eng.pdf) (last access 13 October 2009).
- MSC (Marine Stewardship Council) (2009) Net Benefits: The first ten years of MSC certified sustainable fisheries. URL: <http://www.msc.org/documents/fisheries-factsheets/net-benefits-report/net-benefits-introduction-web.pdf>
- Mulder, I. ten Kate, K. and Scherr S.,(2006) Private sector demand in markets for ecosystem services: preliminary findings. Forest Trends. URL: [www.fsd.nl/downloadattachment/72341/60533/private\\_sector\\_demand.pdf](http://www.fsd.nl/downloadattachment/72341/60533/private_sector_demand.pdf)
- Organic Monitor Gives (2009a) "Organic Monitor Gives 2009 Predictions" (30 January). URL: <http://www.organicmonitor.com/r3001.htm>
- Organic Monitor (2009b) "Global Organic Market: Time for Organic Plus Strategies" (29 May). URL: <http://www.organicmonitor.com/r2905.htm>
- Organic Trade Association (OTA) (2009) "Organic Trade Association Releases Its 2009 Organic Industry Survey" press release (4 May). URL: [http://www.organicnewsroom.com/2009/05/organic\\_trade\\_association\\_rele\\_1.html](http://www.organicnewsroom.com/2009/05/organic_trade_association_rele_1.html)
- Parker, C. Mitchell, A. Trivedi, M. and Mardas, N., (2009) The Little REDD+ Book. Global Canopy Programme (GCP). URL: [http://www.globalcanopy.org/themedia/file/PDFs/LRB\\_lowres/lrb\\_en.pdf](http://www.globalcanopy.org/themedia/file/PDFs/LRB_lowres/lrb_en.pdf)
- Plambeck, E. L. and Denend, L., (2008) The Greening of Wal-Mart. Stanford Social Innovation Review (Spring). URL: <http://csi.gsb.stanford.edu/greening-wal-mart> (last access 29 June 2010).
- Prescott, J., (2009) "Buyers pre-empt demand for sustainability". Ecotextile News, (25 September). URL: [www.ecotextile.com/news\\_details.php?id=10016](http://www.ecotextile.com/news_details.php?id=10016)
- State of Victoria Department of Sustainability and Environment (2006) Bushbroker: Native vegetation credit registration and trading.
- TEEB – The Economics of Ecosystems and Biodiversity (2009) TEEB for National and International Policy Makers (2009) URL: <http://teebweb.org/ForPolicymakers/tabid/1019/language/en-US/Default.aspx> (last access 9 July 2010).
- Tourism Sustainability Council (TSC) 2009. "Partnership for Global Sustainable Tourism Criteria and Sustainable Tourism Stewardship Council Announce Merger to Form Tourism Sustainability Council". URL: [http://www.sustainabletourismcriteria.org/index.php?option=com\\_content&task=view&id=266&Itemid=483](http://www.sustainabletourismcriteria.org/index.php?option=com_content&task=view&id=266&Itemid=483)
- Traffic International (2006) Traffic Bulletin, Vol. 21 No. 1 (July).
- UNEP (2008) Forest Biodiversity. COP 9 MOP 4 Bonn, Germany.
- UNEP and New Energy Finance (2009) Global Trends in Sustainable Energy Investment 2009. URL: [http://sefi.unep.org/fileadmin/media/sefi/docs/publications/Executive\\_Summary\\_2009\\_EN.pdf](http://sefi.unep.org/fileadmin/media/sefi/docs/publications/Executive_Summary_2009_EN.pdf)

- UNEP/CBD/WG-RI/3/INF/13 (2010) Innovative Financial Mechanisms - Initiating Work on a Green Development Mechanism. URL: <http://www.cbd.int/wgri3/meeting/Documents.shtml>
- VIETRADE (Vietnam Trade Promotion Agency) (2006) Vietnamese handicrafts and traditional craft villages (November).
- VIETRADE (2008) Vietnamese handicrafts and traditional craft villages (November).
- Willan, Becky (2009) "Twenty Trends for Sustainability in 2009-10", Environmental Leader (24 September). URL: <http://www.environmentalleader.com/2009/09/24/twenty-trends-for-sustainability-in-2009-10/>
- Wilhelmsson, D. Malm, T. Thompson, R. Tchou, J. Sarantakos, G. McCormick, N. Luitjens, S. Gullström, M. Patterson Edwards, J.K. Amir, O. and Dubi, A., (eds.) (2010) Greening Blue Energy: Identifying and managing the biodiversity risks and opportunities of off shore renewable energy. URL: <http://data.iucn.org/dbtw-wpd/edocs/2010-014.pdf>
- Wille, C., (2009) Rainforest Alliance - Sustainable Agriculture Network. Presentation at the Sustainability Conference Nuremberg, (February).
- World Bank (2009) State and Trends of the Carbon Market 2009. URL: [http://wbcarbonfinance.org/docs/State\\_\\_\\_Trends\\_of\\_the\\_Carbon\\_Market\\_2009-FINAL\\_26\\_May09.pdf](http://wbcarbonfinance.org/docs/State___Trends_of_the_Carbon_Market_2009-FINAL_26_May09.pdf)
- WHO (World Health Organization) (2003) WHO guidelines on good agricultural and collection practices (GACP) for medicinal plants. Geneva.
- WRI (World Resources Institute) (2008) Examples of Ecosystem Service-related Business Risks and Opportunities. URL: [www.wri.org/project/ecosystem-services-review](http://www.wri.org/project/ecosystem-services-review)
- WRI, WBCSD and Meridian Institute (2008) The Corporate Ecosystem Services Review: Guidelines for Identifying Business Risks and Opportunities Arising from Ecosystem Change. World Resources Institute, Washington DC. URL: [http://pdf.wri.org/corporate\\_ecosystem\\_services\\_review.pdf](http://pdf.wri.org/corporate_ecosystem_services_review.pdf)
- [www.bamboosushipdx.com](http://www.bamboosushipdx.com) (last access 9 July 2010)
- [www.eartheasy.com](http://www.eartheasy.com) (last access 9 July 2010)
- [www.ecoclub.com](http://www.ecoclub.com) (last access 9 July 2010)
- [www.ecoenterprisesfund.com](http://www.ecoenterprisesfund.com) (last access 9 July 2010)
- [www.ecotourism.org](http://www.ecotourism.org) (last access 9 July 2010)
- [www.gdm.earthmind.net](http://www.gdm.earthmind.net) (last access 9 July 2010)
- [www.lohas.com](http://www.lohas.com) (last access 9 July 2010)
- [www.msc.org](http://www.msc.org) (last access 9 July 2010)
- [www.missionmarkets.com](http://www.missionmarkets.com) (last access 9 July 2010)
- [www.naturalfibres2009.org](http://www.naturalfibres2009.org) (last access 9 July 2010)
- [www.naturalvalueinitiative.org](http://www.naturalvalueinitiative.org) (last access 9 July 2010)
- [www.planeta.com](http://www.planeta.com) (last access 9 July 2010)
- [www.rainforest-alliance.org](http://www.rainforest-alliance.org) (last access 9 July 2010)
- [www.wfto.com](http://www.wfto.com) (last access 9 July 2010)
- [www.wri.org](http://www.wri.org) (last access 9 July 2010)