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NATURE IN PERFORMANCE

Initial Recommendations for Integrating Ecosystem Services into Business Performance Systems

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Executive Summary

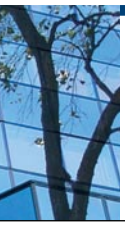
In 2008, the World Resources Institute (WRI), in collaboration with the World Business Council for Sustainable Development (WBCSD) and the Meridian Institute, published the *Corporate Ecosystem Services Review* (ESR). The ESR is a structured method that helps managers develop strategies to address business risks and capture opportunities arising from their company's dependence and impact on ecosystems.

Over the course of the past few years, a number of business managers have inquired about how to integrate the ESR or, more fundamentally, considerations of ecosystem services into their existing business performance systems. Business performance systems are the range of tools, methods, techniques, approaches, and practices used by managers to guide, measure, monitor, and improve corporate performance. Examples include corporate strategy development procedures, product design guidelines, environmental management systems, environmental impact assessments, environmental and social impact assessments, environmental audits, and sustainability reporting.

Most companies already have their own established business performance systems. The question managers are now asking is "How can considerations about ecosystem services and their impacts on the bottom line be integrated into our existing systems?" This publication tackles this and a series of related questions. Key messages include:

- Ecosystems provide businesses—as well as people and communities—with a wide range of benefits known as ecosystem services. Ecosystem services matter to companies because they are intimately linked in two fundamental ways. First, businesses *depend* upon ecosystems and the services ecosystems provide. Second, businesses *impact* ecosystems and the services ecosystems provide. These two linkages can pose a number of operational, regulatory/legal, reputational, market, or financing risks and opportunities to a company.
- Basic principles that guide how to integrate ecosystem service considerations into business performance systems, regardless of the system, include: (1) consider all ecosystem services; (2) assess dependence; (3) identify opportunities; (4) look beyond the company boundaries; (5) engage stakeholders and experts; and (6) manage with incomplete data.
- Ecosystem service considerations are relevant to a variety of business performance systems, including corporate strategy development processes, product design guidelines and life-cycle assessments, environmental and social impact assessments, environmental management systems, corporate sustainability reporting, and investment screening processes.

- The ISO 14001 guidance on environmental management systems contains at least four components into which ecosystem service considerations could be readily inserted: (1) environmental policy, (2) aspects review, (3) objectives and targets, and (4) management review.
- The Global Reporting Initiative (GRI) reporting framework contains at least four guidance components into which ecosystem service considerations could be readily inserted: (1) materiality, (2) sustainability context, (3) organizational profile and strategy, and (4) performance indicators.
- For further guidance and reference, a number of scientific assessments, business tools, and working groups exist and can help business managers integrate ecosystem services into their business performance systems.



Integrating ecosystem service considerations and business performance systems

In 2008, the World Resources Institute (WRI), in collaboration with the World Business Council for Sustainable Development (WBCSD) and the Meridian Institute, published the *Corporate Ecosystem Services Review* (ESR). The ESR is a structured method that helps managers develop strategies to address business risks and opportunities arising from their company's dependence and impact on ecosystems. As of 2011, more than 300 companies have applied the ESR to improve their business operations, supply chain management, and corporate strategies.

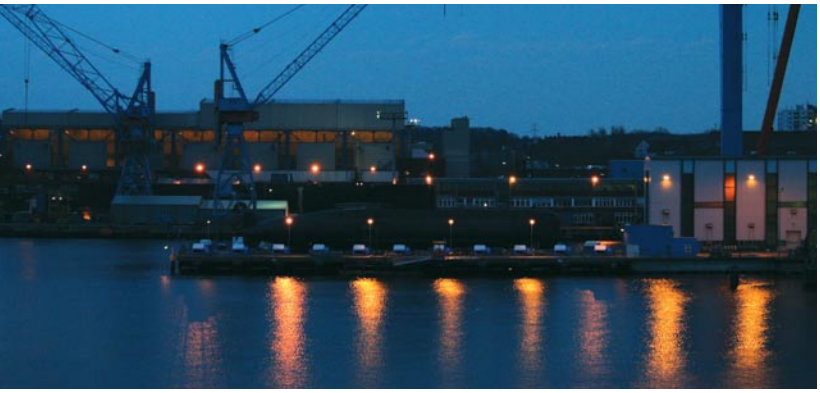
Over the course of the past few years, however, a number of corporate managers have inquired about how to integrate the ESR—or, more fundamentally, ecosystem services—into their existing business performance systems (see Box 1 for definitions of these and other terms used in this publication). Most companies already have their own established business performance systems, including corporate strategy development procedures, product development guidelines, environmental management systems, and corporate reporting procedures. How can considerations about ecosystem services be integrated into these existing systems?

This publication tackles this question. It begins by addressing three questions that underpin the rest of the publication:

1. What are ecosystem services?
2. Why should businesses care about ecosystem services?
3. What is the *Corporate Ecosystem Services Review*?

Readers who are already familiar with these concepts can jump to the subsequent sections, which address the following questions raised by corporate managers the authors have engaged:

4. For what types of business decisions and associated performance systems are ecosystem service considerations relevant?
5. What are some basic principles for integrating ecosystem service considerations into business performance systems?
6. How could ecosystem service considerations be integrated into environmental management systems, such as those conforming to the ISO 14001 standard?
7. How could ecosystem service considerations be integrated into sustainability reports, such as those conforming to the Global Reporting Initiative Reporting Framework?
8. What resources are available to help managers better integrate ecosystem service considerations into their business performance systems?



Box 1. Some Key Terms

Business performance systems are the range of tools, methods, techniques, approaches, and practices used by managers to guide, measure, monitor, and improve corporate performance. Examples include corporate strategy development procedures, product design guidelines, environmental management systems, environmental impact assessments, environmental and social impact assessments, environmental audits, and sustainability reporting.

An **ecosystem** is a dynamic complex of plant, animal, and microorganism communities and their nonliving environment interacting as a functional unit. Examples of ecosystems include deserts, coral reefs, wetlands, and forests.

Ecosystem services, sometimes called "environmental services" or "ecological services," are the benefits that people obtain from ecosystems. Examples include freshwater, timber, climate regulation, protection from natural hazards, erosion control, and recreation.

A company **depends** on an ecosystem service if that service functions as an input or if it enables, enhances, or influences environmental conditions required for successful corporate performance.

A company **impacts** an ecosystem service if the company affects the quantity or quality of the service.

The **United Nations (UN) Global Compact Performance Model** is a framework to help companies implement the UN global compact principles and facilitate continuous improvement. It guides managers from the vision-setting process through the measurement and reporting of outcomes. It can be applied at any scale of corporate operation.

Developed by the International Organization for Standardization, the **ISO 14001** standard provides certifiable guidelines specifying the requirements of an environmental management system.

The Global Reporting Initiative's (GRI) Sustainability Reporting Framework provides a standardized format and set of indicators that organizations can use to measure and report their economic, environmental, and social performance.

Given the number of companies that adhere to the United Nations Global Compact Performance Model, ISO 14001, and the Global Reporting Initiative, this publication focuses on ecosystem service considerations relative to these three systems in particular. The authors recognize that there are other business performance systems that are very important for companies and for which ecosystem service considerations are relevant, but this publication does not delve into them. Other literature is available to help with some of these additional business performance systems. For instance, the *TEEB for Business* report provides suggestions on how to integrate ecosystem service considerations into management accounting, life-cycle management, and sustainability reporting (TEEB 2010).

This publication is designed for business managers responsible for environmental management, sustainability performance monitoring, and other facets of corporate sustainability. Questions 1, 2, 3, and 8 are high level and geared for non-specialists. Questions 4, 5, 6, and 7 are a bit more detailed and geared for those familiar with specific performance systems such as ISO 14001 and the GRI framework.

WRI developed this publication with assistance from the sustainability consulting firm Irbaris. In preparation for this report, WRI conducted a series of stakeholder and expert dialogues in Jakarta, Nairobi, Paris, São Paulo, and Washington. Escola de Administração de Empresas de São Paulo da Fundação Getulio Vargas assisted with the dialogue in São Paulo, and the Inspire Institute assisted with the dialogue in Paris. In total, more than 100 experts in corporate sustainability, environmental management, ecosystem services, and related disciplines participated in these dialogues.

Question 1. *What are ecosystem services?*

Ecosystems provide businesses—as well as people and communities—with a wide range of goods and services. For example, forests supply timber and wood fiber, regulate climate by absorbing carbon dioxide, and provide a place for recreation. Coral reefs attract tourists, serve as nurseries for commercial fish species, and protect properties along coastlines from storm surges. Wetlands absorb waste, help reduce floods, and purify water. These and other benefits from nature are known as ecosystem services.[1]

The Millennium Ecosystem Assessment[2] identified four categories of ecosystem services:

- *Provisioning services:* The goods or products obtained from ecosystems such as food, freshwater, timber, and fiber.
- *Regulating services:* The benefits obtained from an ecosystem's control of natural processes, such as climate, disease, erosion, water flows, and pollination, as well as protection from natural hazards. "Regulating" in this context is not referring to governmental policies or regulations, but rather to a natural phenomenon.
- *Cultural services:* The nonmaterial benefits obtained from ecosystems such as recreation, spiritual values, educational benefits, and aesthetic enjoyment.
- *Supporting services:* The natural processes such as nutrient cycling and primary production that maintain the other services.

Approximately two dozen ecosystem services can be relevant to varying degrees to business performance (Table 1).

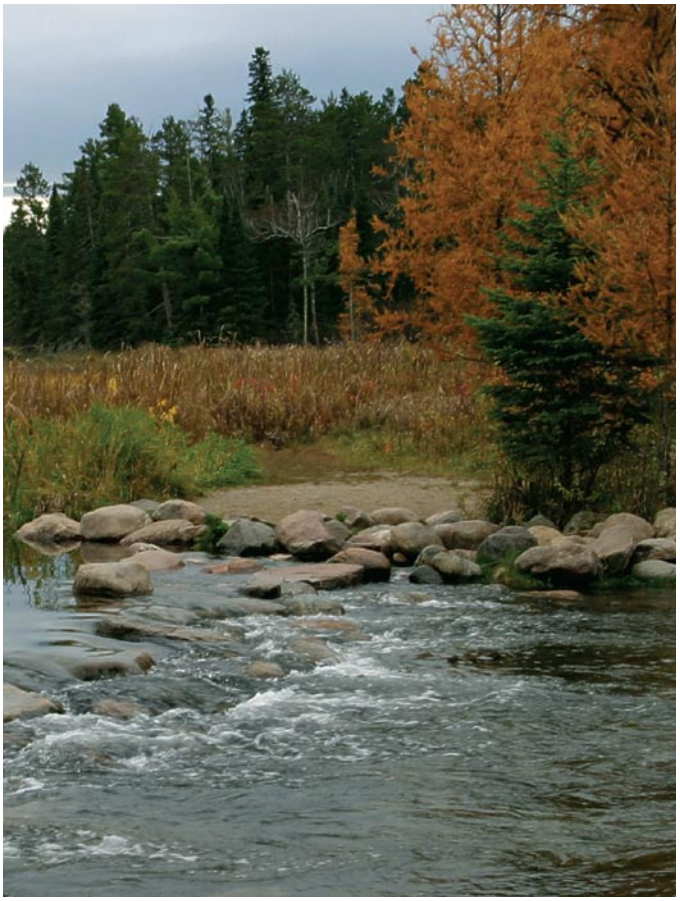


Table 1 Ecosystem Services, Definitions, and Examples

Service	Subcategory	Definition	Examples
Provisioning services: The goods or products obtained from ecosystems			
Food	Crops	Cultivated plants or agricultural produce harvested by people for human or animal consumption as food	• Grains • Vegetables • Fruits
	Livestock	Animals raised for domestic or commercial consumption or use	• Chickens • Pigs • Cattle
	Capture fisheries	Wild fish captured through trawling and other non-farming methods	• Cod • Crabs • Tuna
	Aquaculture	Fish, shellfish, and/or plants that are bred and reared in ponds, enclosures, and other forms of freshwater or saltwater confinement for purposes of harvesting	• Shrimp • Oysters • Salmon
	Wild foods	Edible plant and animal species gathered or captured in the wild	• Fruits and nuts • Fungi • Bushmeat
Biological raw materials	Timber and other wood products	Products made from trees harvested from natural forest ecosystems, plantations, or non-forested lands	• Industrial roundwood • Wood pulp • Paper
	Fibers and resins	Non-wood and non-fuel fibers and resins	• Cotton, silk, hemp • Twine, rope • Natural rubber
	Animal skins	Processed skins of cattle, deer, pig, snakes, sting rays, or other animals	• Leather, rawhide, cordwain
	Sand	Sand formed from coral and shells	• White sand from coral and white shells • Colored sand from shells
	Ornamental resources	Products derived from ecosystems that serve aesthetic purposes	• Tagua nut, wild flowers, coral jewelry
Biomass fuel		Biological material derived from living or recently living organisms—both plant and animal—that serves as a source of energy	• Fuelwood and charcoal • Grain for ethanol production • Dung
Freshwater		Inland bodies of water, groundwater, rainwater, and surface waters for household, industrial, and agricultural uses	• Freshwater for drinking, cleaning, cooling, industrial processes, electricity generation, or mode of transportation
Genetic resources		Genes and genetic information used for animal breeding, plant improvement, and biotechnology	• Genes used to increase crop resistance to disease or pests
Biochemicals, natural medicines, and pharmaceuticals		Medicines, biocides, food additives, and other biological materials derived from ecosystems for commercial or domestic use	• Echinacea, ginseng, garlic • Paclitaxel as basis for cancer drugs • Tree extracts used for pest control
Regulating services: The benefits obtained from an ecosystem's control of natural processes			
Maintenance of air quality		Influence ecosystems have on air quality by emitting chemicals to the atmosphere (i.e., serving as a "source") or extracting chemicals from the atmosphere (i.e., serving as a "sink")	• Lakes serve as a sink for industrial emissions of sulfur compounds • Tree and shrub leaves trap air pollutants near roadways
Regulation of climate	Global	Influence ecosystems have on the global climate by emitting greenhouse gases or aerosols to the atmosphere or by absorbing greenhouse gases or aerosols from the atmosphere	• Forests capture and store carbon dioxide • Cattle and rice paddies emit methane
	Regional and local	Influence ecosystems have on local or regional temperature, precipitation, and other climatic factors	• Forests can impact regional rainfall levels

Table 1 Ecosystem Services, Definitions, and Examples (continued)

Service	Definition	Examples
Regulating services *(continued)*		
Regulation of water timing and flows	Influence ecosystems have on the timing and magnitude of water runoff, flooding, and aquifer recharge, particularly in terms of the water storage potential of the ecosystem or landscape	• Permeable soil facilitates aquifer recharge • River floodplains and wetlands retain water—which can decrease flooding—reducing the need for engineered flood control infrastructure
Erosion control	Role ecosystems play in retaining and replenishing soil and sand deposits	• Vegetation such as grass and trees prevents soil loss due to wind and rain and prevents siltation of waterways • Coral reefs, oyster reefs, and sea grass beds reduce loss of land and beaches due to waves and storms
Water purification and waste treatment	Role ecosystems play in the filtration and decomposition of organic wastes and pollutants in water; assimilation and detoxification of compounds through soil and subsoil processes	• Wetlands remove harmful pollutants from water by trapping metals and organic materials • Soil microbes degrade organic waste, rendering it less harmful
Disease mitigation	Influence that ecosystems have on the incidence and abundance of human pathogens	• Some intact forests reduce the occurrence of standing water—a breeding area for mosquitoes—which lowers the prevalence of malaria
Maintenance of soil quality	Role ecosystems play in sustaining soil's biological activity, diversity and productivity; regulating and partitioning water and solute flow; storing and recycling nutrients and gases; among other functions	• Some organisms aid in decomposition of organic matter, increasing soil nutrient levels • Some organisms aerate soil, improve soil chemistry, and increase moisture retention
Pest mitigation	Influence ecosystems have on the prevalence of crop and livestock pests and diseases	• Predators from nearby forests—such as bats, toads, and snakes—consume crop pests
Pollination	Role ecosystems play in transferring pollen from male to female flower parts	• Bees from nearby forests pollinate crops
Natural hazard mitigation	Capacity for ecosystems to reduce the damage caused by natural disasters such as hurricanes and tsunamis and to maintain natural fire frequency and intensity	• Mangrove forests and coral reefs protect coastlines from storm surges • Biological decomposition processes reduce potential fuel for wildfires
Cultural services: The nonmaterial benefits obtained from ecosystems		
Recreation and ecotourism	Recreational pleasure people derive from natural or cultivated ecosystems	• Hiking, camping, and bird watching • Going on safari • Scuba diving
Ethical and spiritual values	Spiritual, religious, aesthetic, intrinsic, "existence," or similar values people attach to ecosystems, landscapes, or species	• Spiritual fulfillment derived from sacred lands and rivers • People's desire to protect endangered species and rare habitats
Educational and inspirational values	Information derived from ecosystems used for intellectual development, culture, art, design, and innovation	• The structure of tree leaves has inspired technological improvements in solar power cells • School fieldtrips to nature preserves aid in teaching scientific concepts and research skills
Supporting services: The natural processes that maintain the other ecosystem services		
Habitat	Natural or semi-natural spaces that maintain species populations and protect the capacity of ecological communities to recover from disturbances	• Native plant communities often provide pollinators with food and structure for reproduction • Rivers and estuaries provide nurseries for fish reproduction and juvenile development • Large natural areas and biological corridors allow animals to survive forest fires and other disturbances
Nutrient cycling	Flow of nutrients (e.g., nitrogen, sulfur, phosphorus, carbon) through ecosystems	• Transfer of nitrogen from plants to soil, from soil to oceans, from oceans to the atmosphere, and from the atmosphere to plants
Primary production	Formation of biological material by plants through photosynthesis and nutrient assimilation	• Algae transform sunlight and nutrients into biomass, thereby forming the base of the food chain in aquatic ecosystems
Water cycling	Flow of water through ecosystems in its solid, liquid, or gaseous forms	• Transfer of water from soil to plants, plants to air, and air to rain

Sources: Millennium Ecosystem Assessment 2005; Braat 2008; Hanson et al. 2008; TEEB 2010.

Question 2. *Why should businesses care about ecosystem services?*

Ecosystem services matter to companies because the two are intimately linked in two fundamental ways. First, businesses *depend* upon ecosystems and the services ecosystems provide. For example, the beverage industry depends on the supply of freshwater. Agribusiness relies on nature's pollination, soil quality regulation, and erosion control services. Insurance companies benefit from the coastal protection coral reefs provide, while the tourism industry benefits from this ecosystem's recreational value.

Second, businesses *impact* ecosystems and the services ecosystems provide. For instance, agribusiness impacts the availability of freshwater and the ability of natural ecosystems to control erosion in watersheds where agriculture dominates. The timber industry can impact the ability of a natural forest to sequester carbon. The mining industry can impact the cultural services indigenous peoples receive from native landscapes when mines are built.

Such dependence and impact on ecosystem services can pose a number of operational, regulatory/legal, reputational, market, or financing risks and opportunities to a company (Table 2). For instance, agricultural firms that depend upon insect pollinators face operational risks when bee populations collapse. As coral reefs degrade, companies insuring coastal properties risk facing larger claims, while hoteliers that rely on reefs to attract tourists risk losing customers. Agribusinesses consuming the majority of freshwater in a watershed may face new regulatory or reputational risks when governments try to balance water supply and demand in water-stressed regions. Timber companies might find new market opportunities if they manage forestlands to increase carbon sequestration. A mining company may face legal, reputational, or financing risks if it damages the food, freshwater, or spiritual values provided to local communities by the ecosystem surrounding the mine.

Corporate examples for each type of risk and opportunity listed in Table 2 are profiled in *The Corporate Ecosystem Services Review* (Hanson et al. 2008).[3] More examples are available online at **http://www.wri.org/project/ecosystem-services-review/tools** (see "Case Examples" PowerPoint).

Because of these risks and opportunities arising from a company's dependence and/or impact on ecosystem services, integrating ecosystem service considerations into business performance systems is important for corporate health. The company that does not consider ecosystem services may face unnecessary risks. For instance, competitors may see and capitalize on overlooked opportunities. Investors increasingly may ask questions about ecosystem services, as indicated by the International Finance Corporation's new Principles and Criteria, which require new investments to screen for ecosystem service impacts and dependencies (IFC 2011). Communities may challenge companies for access to rights and benefits associated with local ecosystems. Likewise, the company that does not consider ecosystem services may overlook opportunities such as new revenue streams from landholdings or new markets for ecosystem services.

Table 2 Types of Risks and Opportunities Arising from Corporate Dependence and Impact on Ecosystem Services

Not Exhaustive

Type	Risk	Opportunity
Operational	• Increased scarcity or cost of inputs • Reduced output or productivity • Disruption to business operations	• Increased efficiency • Low-impact industrial processes
Regulatory and legal	• Extraction moratoria • Lower quotas • Fines • User fees • Permit or license suspension • Permit denial • Lawsuits	• Formal license to expand operations • New products to meet new regulations • Opportunity to shape government policy
Reputational	• Damage to brand or image • Challenge to social "license to operate"	• Improved or differentiated brand
Market and product	• Changes in customer preferences (public sector, private sector)	• New products or services • Markets for certified products • Markets for ecosystem services • New revenue streams from company-owned or managed ecosystems
Financing	• Higher cost of capital • More rigorous lending requirements	• Increased investment by progressive lenders and socially responsible investment funds

Source: Hanson, C. et al. 2008

Question 3.
What is the Corporate Ecosystem Services Review?

The *Corporate Ecosystem Services Review* (ESR) (Hanson et al. 2008) is a structured methodology designed to help business managers proactively develop strategies to manage business risks and opportunities arising from their company's dependence and impact on ecosystems. Managers can either conduct an entire ESR as a stand-alone process or integrate it (or portions of it) into their existing strategy development processes. Likewise, companies can integrate portions of it into existing business performance systems.

The ESR methodology consists of five steps:

1. **Select the scope.** Choose the "scope" or boundary within which to conduct the ESR in order to keep the process manageable and yield more actionable results. Candidates include a business unit, product, market, corporate landholdings, infrastructure project, major supplier, or major customer segment, among others.
2. **Identify priority ecosystem services.** Systematically evaluate in a structured yet rapid manner the company's dependence and impact on the nearly two dozen ecosystem services summarized in Table 2. Determine which of these are "priority" services—the ones most likely to be a source of risk or opportunity for the company. These priority ecosystem services are the focus of analysis in subsequent steps; the other services are screened out.
3. **Analyze trends in priority services.** Research and evaluate the condition and trends in the priority ecosystem services identified in step 2, as well as the drivers of these trends. Step 3 provides managers with relevant information and insights so that they can later identify business risks and opportunities that may arise from these trends.
4. **Identify business risks and opportunities.** Identify and evaluate the business risks and opportunities that might arise due to the trends in the priority ecosystem services identified in step 3.
5. **Develop strategies.** Develop strategies for managing the risks and opportunities identified in step 4. Once completed, managers will have a prioritized set of strategies to implement.

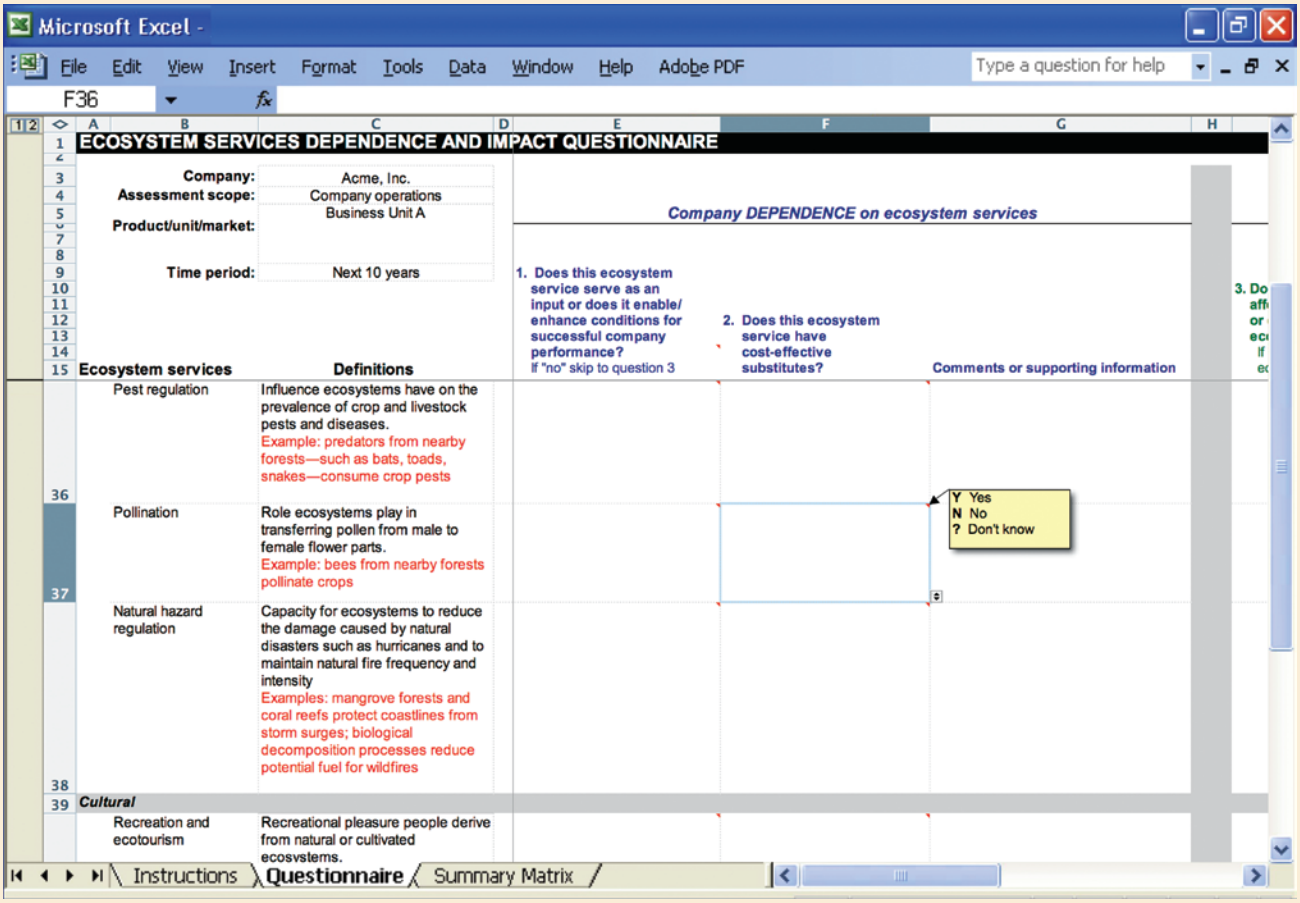
Each step of the ESR includes an assessment framework designed to help managers navigate the step. Two of these assessment frameworks are referenced later in this publication. One is the Dependence and Impact Assessment Tool (Figure 1), a worksheet for step 2 in the ESR that helps managers determine the relevance or materiality of an ecosystem service to corporate performance.[4] The spreadsheet includes a questionnaire laid out in a matrix format. The ecosystem services, with definitions and examples of each, are listed vertically, while five questions regarding corporate dependence and impact on ecosystem services are listed horizontally. A summary matrix translates the responses provided in the questionnaire into a one-page chart. The matrix indicates whether the company's impact and dependence on each ecosystem service is high, medium, or low and whether the impact is positive or negative. With this information, managers can prioritize ecosystem services or determine which services are most material.

Another tool is the ESR's Trends and Drivers Framework (Figure 2), a simple structure designed to guide research and analysis so that managers arrive at a comprehensive understanding of the important trends in each of the priority ecosystem services. The framework consists of five categories of information: (1) conditions and trends in the supply of and demand for an ecosystem service; (2) the direct drivers of change in the quantity or quality of an ecosystem service; (3) how, where, and to what degree the company is contributing to these direct drivers; (4) who else is contributing to these direct drivers; and (5) the indirect drivers that underlie the direct drivers of change. Data and information on each may be qualitative or quantitative in nature. Conducting interviews, reviewing existing research, or commissioning original analyses—where significant data gaps exist—are recommended approaches to gathering sufficient data.

Armed with this information, managers then evaluate the implications for the company of these trends per priority service (step 4). To help trigger ideas and insights, managers can systematically consider the types of business risks and opportunities outlined in Table 2. Once consideration of one service is complete, managers move on to the next priority service and go through the same process. Once all the risks and opportunities for each service have been identified, managers proceed to identify strategies for reducing the risks and enhancing the opportunities (step 5).

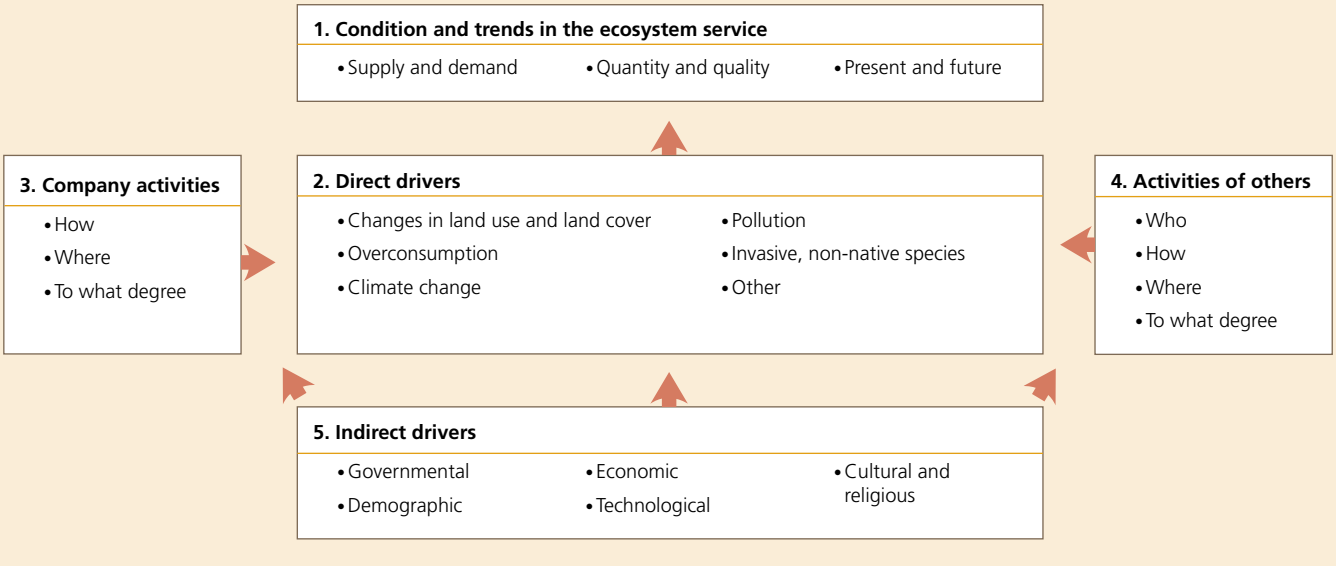
For more detail about how to conduct an ESR, case examples of ESR applications, and business benefits achieved, see *The Corporate Ecosystem Services Review* (Hanson et al. 2008) or visit **www.wri.org/ecosystems/esr**. Companies seeking to further quantify or value their most relevant ecosystem service impacts and dependencies can refer to the *Guide to Corporate Ecosystem Valuation* (WBCSD 2011). The guide complements the ESR and is available at **www.wbcsd.org**.

Figure 1 View of the Dependence and Impact Assessment Tool



Source: Hanson, C. et al. 2008

Figure 2 The Trends and Drivers Framework

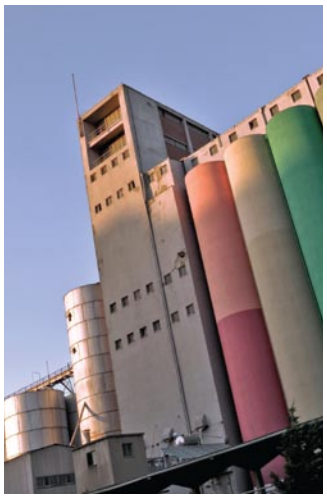


Source: Hanson, C. et al. 2008

Question 4. *For what types of business decisions and associated performance systems are ecosystem service considerations relevant?*

Ecosystem service considerations are relevant to a wide variety of business decisions. For example, to the degree that a company's dependence or impact on an ecosystem service poses business risks or opens the door for new business opportunities, ecosystem service considerations are relevant to corporate strategy, risk mitigation planning, and new product development. To the degree that a company's new development project might impact an ecosystem service regulated by law or valued by communities, ecosystem service considerations are relevant to project design, site planning, and green field development. To the degree that a company seeks to improve relationships and brand with customers, investors, and stakeholders, ecosystem service considerations are relevant to corporate reporting.

Consequently, ecosystem service considerations are relevant to a variety of associated business performance systems. By "business performance systems," this publication refers to the range of tools, methods, techniques, approaches, and practices used by managers to guide, measure, monitor, and improve corporate performance. Examples include corporate strategy development procedures, product design guidelines, environmental management systems, environmental and social impact assessments, and sustainability reporting.



The United Nations (UN) Global Compact Performance Model (Box 2) can help frame the types of business decisions and business performance systems for which ecosystem service considerations may be relevant. The model builds on classic features of total quality management and continuous improvement. It describes various aspects of business performance in terms of ten elements that are grouped into two sets: enablers and results. Against some of these Global Compact Performance Model elements, Table 3 maps some business decisions and their associated business performance systems for which ecosystem service considerations may be relevant. The rest of this publication will discuss generic principles for integrating ecosystem service considerations into any business performance system and then will focus on environmental management systems and sustainability reporting.

Table 3 Business Decisions and Associated Performance Systems

Not Exhaustive

Performance Model element	Example of business decision	Example of business performance system
Vision	• Business vision and goals	• Visioning exercise
Policies & strategies	• Business strategy	• Corporate strategy development processes
	• Environmental policy and management	• Environmental management systems (see question 6 of this publication)
Resources	• Financial investment	• Financial and project investment screening processes
Processes & innovation	• Product development	• Product design guidelines and life-cycle assessments
	• Project development and design	• Environmental and social impact assessments
	• Environmental management	• Environmental management systems and cleaner production processes
Reporting	• Performance monitoring and disclosure	• Corporate sustainability reporting (see question 7 of this publication)

Source: Hanson, C. et al. 2008

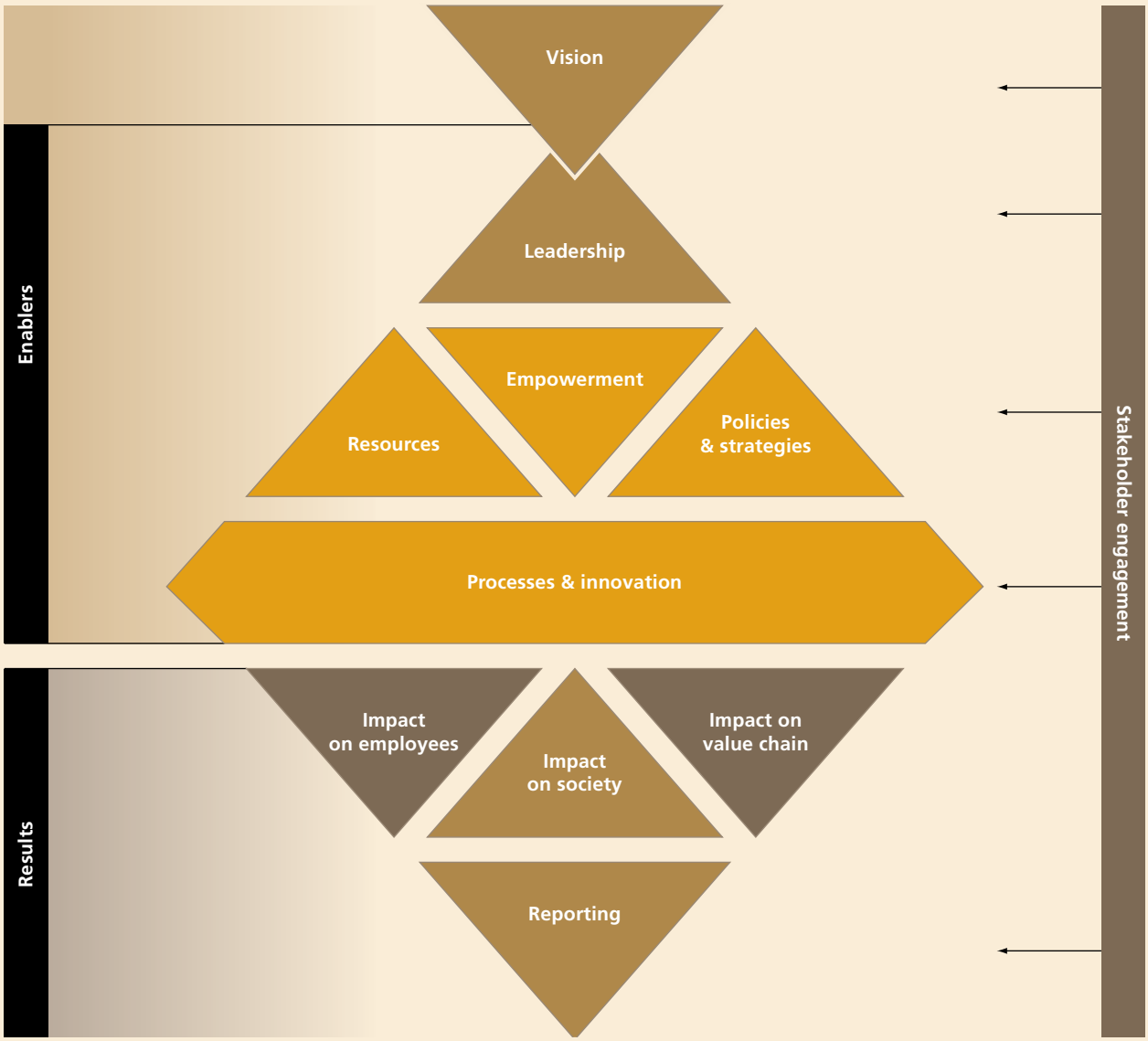
Box 2 The Global Compact Performance Model

The Global Compact (UN Global Compact 2010) is among the world's most popular voluntary corporate sustainability initiatives. UN Secretary General Kofi Annan launched the compact in 2000 to build momentum in the private sector for addressing social and environmental needs and pursuing values-based management. The initiative has grown significantly over the years, involving business, labor, and a core group of UN agencies. It has more than 8,700 corporate signatories in 130 countries.

Global Compact member companies are required to report on annual progress in implementing the compact's ten universal principles on human rights, labor standards, the environment, and anti-corruption (UN Global Compact n.d.). The environmental principles are:

- ***Principle 7:*** Support a precautionary approach to environmental challenges such that a lack of full scientific certainty shall not postpone cost-effective measures to prevent environmental degradation.
- ***Principle 8:*** Undertake initiatives to promote greater environmental responsibility by integrating self-regulation into all business decision making, and fostering openness and dialogue with employees and the public.
- ***Principle 9:*** Encourage development and diffusion of environmentally friendly technologies through appropriate research, full life-cycle thinking, and alliances among service providers and users.

The Global Compact Performance Model



Drawing on the experience of its members, a working group of experts developed the Global Compact Performance Model in 2002 to provide a framework managers could use for putting the universal principles of the compact into practice in business. The performance model is based on proven management principles that stress leadership from the top, implementation of policies through systematic processes in every aspect of corporate activity, and continuous improvement. It builds on classic elements of total quality management and the never-ending cycle of Plan-Do-Check-Act for improvement (Deming 1982).

The performance model provides a roadmap for integrating the ten universal principles into core business operations. It is designed to help managers improve sustainability management in four key areas:

- ***Vision*** for enacting the Global Compact's principles and related sustainability goals
- ***Enablers*** of management processes, procedures, and actions. These include:
  - *Leadership* to enact the vision by embedding it into organizational culture and guiding its implementation
  - *Policies & strategies* that guide the company toward its vision
  - *Resources* allocation, including time, technology, material assets, capital, and knowledge
  - *Empowerment* of employees through training, delegation of responsibility, and motivation
  - *Processes & innovation* related to the core activities from product conception to disposal
- ***Results*** measurement and communication. These include the company's:
  - *Impact on employee* health, safety, and related cultural issues
  - *Impact on its value chain,* from sourcing all the way through to final consumer benefits
  - *Impact on society,* including the environment and communities
  - *Reporting* on contributions toward sustainability to staff and external stakeholders (using Global Reporting Initiative indicators)
- ***Stakeholder engagement*** through reporting on results, as well as engagement with others on vision and enabling efforts (e.g., corporate policy, product development, land management).

The Global Compact Management Model

The stages provide resources for managers to:

- ***Commit*** to the Global Compact principles
- ***Assess*** risks, opportunities, and impacts
- ***Define*** goals, strategies, and policies
- ***Implement*** strategies and policies
- ***Measure*** and monitor impacts and progress
- ***Communicate*** progress and strategies and engage with stakeholders for continuous improvement

The performance model effectively organizes the managerial components necessary to implement particular social or environmental goals into a "roadmap." Senior managers can mentally step through this roadmap to identify the business processes relevant to a particular goal. Starting with visionary leadership and strategy, the performance model's guidance recognizes access to natural capital as one of the key value drivers in determining competitive advantage (Fussler et al. 2004). The performance model ends by highlighting the company's impact on society, which includes its impact on the natural environment, and the company's reporting on those impacts. In order to integrate ecosystem service considerations into the model's listed elements of business performance, managers can either choose to use new tools and methods or leverage existing processes.

More recently, the Global Compact complemented the performance model with its Sustainability Management Model (UN Global Compact and Deloitte 2010). The new model shifts away from a focus on managerial components and corporate divisions toward a process-based structure that emphasizes workflows. The "assess" stage is where ecosystem service considerations are most applicable. This is the stage during which a company assesses its risks and opportunities—in financial and extra-financial terms—as well as the impact of its operations and activities with respect to the UN Global Compact's universal principles. The company does this on an ongoing basis in order to develop and refine its goals, strategies, and policies. Based on its assessment of risks, opportunities, and impacts, it develops and refines goals and metrics specific to its operating context. Performance metrics are complemented by data about the company's progress toward aligning its actions with the ten principles. The company evaluates the results of its operations through the lens of the ten principles, including that of "environmental responsibility." On metrics for reporting progress, the Global Compact refers participant companies to the indicators found in the GRI guidelines.

Question 5. *What are some basic principles for integrating ecosystem service considerations into business performance systems?*

There are a number of basic principles that can guide how to integrate ecosystem service considerations into business performance systems, regardless of the system: (1) consider all ecosystem services; (2) assess dependence; (3) identify opportunities; (4) look beyond the company's boundary; (5) engage stakeholders and experts; and (6) manage with incomplete data.

1. Consider all ecosystem services

Business performance systems typically assess direct drivers of change to ecosystems and the company's contribution to those drivers, even if they do not refer to them as such. For instance, environmental impact assessments and sustainability reports typically include a company's contribution to pollution in the form of air emissions, water effluents, and land-based waste disposal. Likewise, these performance systems often cover the company's impact on a subset of ecosystem services. For instance, many systems will address the company's freshwater consumption, use of raw biological material such as timber, and conversion of natural habitats.

However, few business performance systems take into consideration the full range of ecosystem services. Notably absent is explicit reference to many regulating, cultural, and supporting ecosystem services. For instance, the stakeholder and expert dialogues that informed this publication highlighted that many business performance systems omit from their standardized checklists ecosystem services such as local climate regulation, water purification, natural hazard regulation, and ethical values. Such omissions could result in environmental issues that are material to corporate performance being overlooked and remaining unaddressed.

It is prudent, therefore, for managers to ensure their systems consider the full range of ecosystem services, especially when screening which environmental issues are most material to business performance. One basic approach for doing this is to refer to the list and definitions of ecosystem services in Table 1 whenever a business performance system provides a checklist of environmental aspects, impacts, or issues. At a minimum, Table 1 can complement these lists and fill in gaps. Subsequent questions in this publication provide further recommendations on how to ensure all business-relevant ecosystem services are identified and incorporated into business performance management.

2. Assess dependence, not just impact

Many business performance systems focus on a company's impact on the environment. For instance, a hydroelectric facility might monitor and disclose its impact on water timing and flows. But successful operation of a hydroelectric facility also depends upon ecosystem services such as erosion control provided by upstream forests. This dependency can become a source of business risk if these forests are cleared and, as a result, erosion accelerates, the dam's reservoir becomes more shallow and, in turn, the company must conduct expensive dredging to maintain the dam's productivity.

Managers, therefore, should assess their company's dependence on ecosystems and ecosystem services. One simple approach for doing this is to insert a dependence and impact assessment, as developed by the ESR (see question 3 and Figure 1), into the business performance system. Subsequent questions will elaborate on how to do this using selected business performance systems as examples.

3. Identify opportunities

Many business performance systems, such as environmental impact assessments, typically focus on risks to a company due to its impact on one or more ecosystem services. For instance, companies in the timber extraction industry rightly assess and monitor their environmental impacts on water quality, erosion, and species habitat in order to avoid potential regulatory and reputational risks. But forest management practices can also improve the quantity or quality of one or more ecosystem services, such as carbon

sequestration or water purification. These improvements could yield timber companies new revenue streams, strengthened brand or image, or other benefits that might go unrecognized if all business performance systems did not consider ecosystem service-related opportunities. Managers, therefore, should be sure to identify and assess business opportunities associated with their company's interaction with ecosystems. One approach for doing this is to insert a "business risk and opportunity identification" exercise—step 4 of the ESR—into the business performance system or to conduct the exercise in conjunction with the system.

4. Look beyond the company's boundary

When incorporating ecosystem service considerations into business performance systems, managers should be cognizant that the intersection of their company's performance and ecosystem health might occur outside the boundary of the company's four walls. For instance, food retailers can face higher prices for or reduced supply of fruit, nuts, and

other produce pollinated by bees during outbreaks of colony collapse disorder (USDA 2010). The ecosystem service upon which the retailers ultimately depend, pollination, occurs (or fails to occur in this case) early in the supply chain, on independently owned farms and orchards.

The scope of application of a business performance system could be a facility, a product, a business unit, a landholding, or some related boundary in which the company has control. But this scope need not be the same as the scope of analysis, especially when considering ecosystem services. It is prudent for managers to systematically—not just on an *ad hoc* basis—look beyond assets their business owns when determining materiality of environmental issues, understanding the sustainability context, and assessing other features such as feedback loops. If this is not done, the performance system may fail to help the business respond to emerging ecosystem service-related risks and opportunities.

5. Engage stakeholders and experts

When incorporating ecosystem service considerations into business performance systems, managers should be sure to consult people outside the company for input. Of course, corporate managers and analysts will likely have knowledge and perspectives that can help determine which ecosystem services are material to corporate performance, identify performance parameters upon which to report, and conduct related matters. Likewise, there may be existing in-house analyses of the company's impact on ecosystems and assessments of selected ecosystem services such as the provision of freshwater.

Solely relying on internal business perspectives, however, can create the risk of perpetuating misperceptions or not using the latest scientific developments when it comes to ecosystem services and corporate performance. Likewise, many drivers of ecosystem change are caused by actors outside the control of the company. Therefore, it is prudent to engage people external to the company for input and consultation. Candidates include, but are not limited to:

- *Local stakeholders* who have a stake in the quantity or quality of ecosystem services being impacted or supplied by the company. A company exposes itself to potential risk when it impacts an ecosystem service valued by others. Consulting with and gaining input from these stakeholders can play a role in ameliorating these risks and demonstrating respect for the rights and interests of stakeholders. Stakeholders can include political representatives of nearby communities or local municipalities, indigenous tribes, nongovernmental organizations, and neighboring companies, among others.
- *Scientific experts* from universities and research institutions renowned for their knowledge of particular ecosystems, ecosystem services, or drivers of ecosystem change.
- *Nongovernmental organizations* and *industry associations* that have in-house experts and relevant research.

6. Manage with incomplete data

Quantitative data on the quantity and quality of many provisioning ecosystem services, such as food, freshwater, and timber, are often available from government statistics agencies, universities, or corporate research. However, quantitative data—and associated indicators and metrics—on many of the regulating, cultural, and supporting ecosystem services are often absent or incomplete (Layke 2009).

Nevertheless, incomplete data should not preclude managers from integrating ecosystem service considerations into their business performance systems; the potential risk of overlooking these considerations is too high (TEEB 2010, Grigg et al. 2009, Hanson et al. 2008). Fortunately, managers are accustomed to using incomplete data—combined with professional judgment—to make business decisions that impact corporate performance. Managers can find alternative sources of information to inform their judgment, including qualitative information, representative case examples, expert input, and proxy data. For instance, to better understand trends in pollination services in an Indian state in the absence of quantitative data, agricultural company Syngenta referred to documented case examples as illustrations of pollinator declines that anecdotes provided by local farmers and experts suggested are occurring (Hanson et al. 2008).

Question 6. *How can ecosystem service considerations be integrated into environmental management systems?*

An environmental management system is used to develop and implement a company's environmental policy and manage the company's environmental aspects. It consists of the approaches companies use to identify, measure, manage, and mitigate environmental risks associated with facilities, products, services, and business activities. As such, it can be quite site-based. An environmental management system includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources (ISO 2004). Most large companies have some form of environmental management system and a related guidance document on the system's procedures.

The most popular form of guidance is the International Organization for Standardization's *14001 Guidance Standard* or ISO 14001.[5] More than 188,000 third-party verified ISO 14001 certifications of plants, processes, and products in 155 countries had been issued by 2008.[6] Based on the "Plan-Do-Check-Act" model (Deming 1982), ISO 14001 provides a system for continuous improvement of environmental performance by helping managers identify critical environmental risks, implement actions to address these risks, check the performance of those actions, and respond to this performance (Figure 3).[7]

ISO 14001 contains at least four components into which ecosystem service considerations could be naturally inserted: (1) environmental policy, (2) aspects review, (3) objectives and targets, and (4) management review.

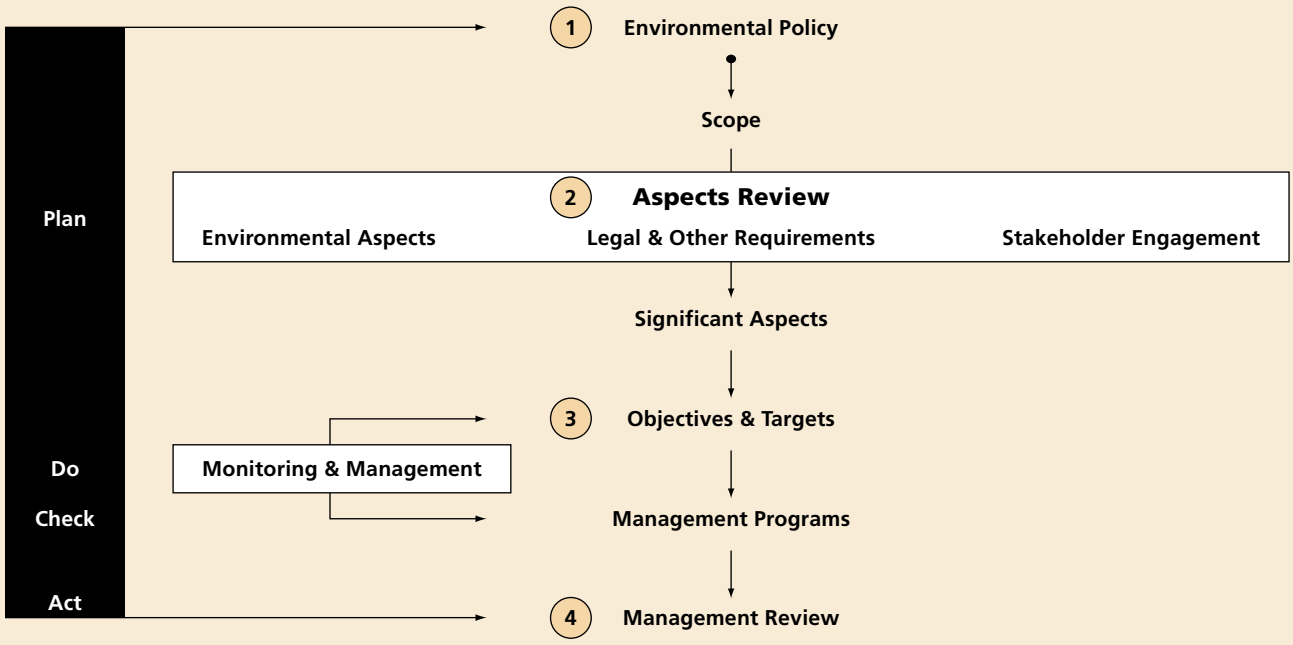
1. **Environmental policy**
   ISO 14001 requires that a company develop and disclose a corporate environmental policy. An environmental policy describes the "overall intentions and direction of

CASE EXAMPLE: **Environmental policy**

Eskom's ISO 14001-conforming Corporate Land and Biodiversity Position ensures that planning and execution of all activities "limit the impact of infrastructure, land use, and other resources on biodiversity and ecosystem services."

Source: Jameson 2010.

Figure 3 The ISO 14001 Framework



Source: Adapted from ISO 2004.

an organization related to its environmental performance as formally expressed by top management…[It] provides a framework for action and for the setting of its environmental objectives and targets" (ISO 2004). But if it is to truly reflect what is important and help improve corporate performance, a company's environmental policy should identify and address those ecosystem services that are sources of potential business risk or opportunity—the material or "priority" ecosystem services—for that company.

To identify the priority ecosystem services for the company, a manager can conduct an ecosystem service dependence and impact assessment. To perform this exercise in a systematic and comprehensive fashion, managers could use the ESR's Dependence and Impact Assessment Tool (see question 3, Figure 1). Once completed, a manager can then develop goals, strategies, practices, or related procedures within the environmental policy that address the "priority" services.

2. Aspects review

ISO 14001 recommends that management conduct an aspects review in which environmental issues that are material to corporate performance for operational, legal, social, or other reasons are identified. In ISO 14001 terminology, "aspect" refers to an element of an organization's activities, products, or services that interact with ecosystem services and other features of the environment. As such, it highlights the company's usage of ecosystem services and the wider environment. A related term is "impact," which refers to any change to ecosystem services or the wider environment—either adverse or beneficial—that results wholly or partially from an organization's activities, products, or services. In other words, aspects can cause impacts.

To be relevant for corporate performance, a company's aspects review should encompass those aspects that depend upon or impact the "priority" ecosystem services for that company. To accomplish this, managers can take a number of steps, including:

- *Determine the priority ecosystem services*. If not already completed, managers can conduct a dependence and impact assessment to identify which ecosystem services are high priority for the company.
- *Expand environmental aspects*. Ensure that the list of environmental aspects considered during the aspects review includes the aspects that influence the company's priority ecosystem services. For example, if water-flow regulation is a priority ecosystem service for a company, then the list of aspects to be reviewed should include those that can affect the timing and flow of water. An ecosystem service dependence and impact assessment for the correct scope of the environmental management system (e.g., entire company, business unit, product) can help identify these priority services.
- *Review legal and other requirements*. Review existing and proposed legislation and regulations relevant to ecosystem services, such as policies regarding water, climate, biodiversity, soil conservation, and landscape conservation. Such a review would highlight aspects that may pose legal or regulatory risk to the company.
- *Engage stakeholders*. Ask relevant stakeholders which ecosystem services they depend upon are being affected by the company. Ecosystem services valued by stakeholders but affected by the company are potential sources of legal or reputational risk. Likewise, services valued by the company but affected by stakeholders are potential sources of operational risk. Engaging stakeholders in such dialogue can be a direct means of gaining insights into what ecosystem services and related corporate aspects are material to the company's risk profile and performance. Stakeholders to involve could include local community representatives, academics, environmental organizations, or representatives of other industries.

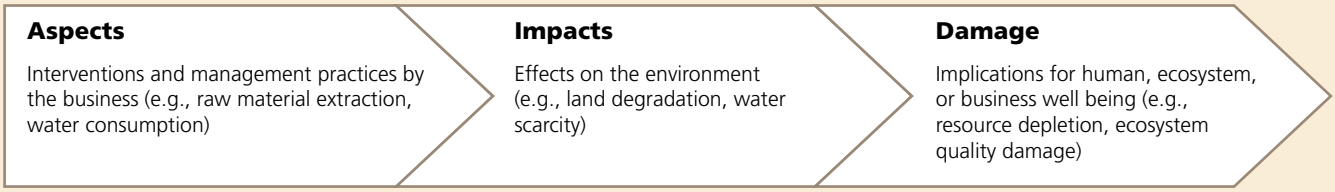
CASE EXAMPLE: **Aspects review**

Natura Cosmeticos interviewed biodiversity stakeholders in 2008 to develop a list of biodiversity and ecosystem service-related aspects material to the company. This led to development of the "Natura Policy for Sustainable Use of Biodiversity and Associated Traditional Knowledge" released in 2010.

Source: Natura 2010.

In conducting an aspects review, managers could also consider life-cycle analyses to ensure a comprehensive inventory or listing of areas where business operations and management practices lead to interactions with ecosystems and potentially set off a chain of impacts and damages. Figure 4 outlines the sequence of events to consider, as per the ISO 14001 and life-cycle assessment (LCA) terminology and standards. This reflects the distinction made in LCA between environmental interventions (such as resource extraction), resultant impact categories (such as land use), and damage categories (such as ecosystem quality). A life-cycle impact assessment weighs different types of uses, their quantities, and duration to calculate the potential ecological value of their impact. The UNEP/SETAC Life Cycle Initiative is studying how to improve the integration of ecosystems and biodiversity-related endpoints or damages into life-cycle methodologies (http://lcinitiative.unep.fr/).

Figure 4 Sequence to consider per ISO 14001 and LCA



3. Objectives and targets

ISO 14001 recommends that managers set objectives and targets that align with the company's environmental policy and that address material aspects. Environmental objectives are overall environmental goals, consistent with the environmental policy, that an organization sets for itself. Targets are detailed performance requirements that need to be met in order to achieve the environmental objectives (ISO 2004). Leveraging the findings of the aspects review, ecosystem service considerations can be incorporated into the company's objectives and targets. For example, in cases where a company currently has a high degree of impact on an ecosystem service, the company could set targets for reducing future impact on the service. To illustrate, a mining company could commit to zero releases of toxic wastewater into nearby waterways used by local communities for fishing and bathing. Likewise, in cases where a company has a high degree of dependence on an ecosystem service, it could set targets for enhancing the ecosystem providing the service. To illustrate, a brewery could commit to conservation of upland watersheds that provide clean freshwater to its beverage facility.

CASE EXAMPLE: **Objectives and targets**

In 2008, The Walt Disney Company set an objective of having a net-positive impact on ecosystems. In order to achieve this objective, the company set near-term targets to develop and implement an integrated approach to design, engineering, and habitat protection for all new construction projects; and to increase the level of support from the Disney Worldwide Conservation Fund over 5 years.

Source: Walt Disney Company 2008.

4. Management review

ISO 14001 recommends that management conduct a periodic review of corporate performance relative to its environmental policy and thereafter adjust practices and procedures to enable continuous improvement. Because neither a company's understanding of its interrelationship with ecosystems nor the science of ecosystem services is static, the management review provides a window of opportunity for a manager to improve incorporation of ecosystem service considerations in his or her company's environmental management system. Steps a manager can take as preparation for (or during) the management review include, but are not limited to:

- Evaluate advancements in ecosystem service-related science, quantitative metrics, and data for the company's priority ecosystem services. Management can then recommend incorporating relevant advancements into the next iteration of the environmental policy, aspects review, monitoring, or other features of the environmental management system.
- Refine (or even redo) the ecosystem service dependence and impact assessment if the management review finds new reasons that corporate performance might be hampered by ecosystem-related risks or challenges. Improved data, greater management familiarity with ecosystem services, or other new inputs might generate material business risks or opportunities overlooked during the previous assessment.
- Introduce or expand staff training on ecosystem services and their relevance to corporate performance, based on the lessons learned from the company's increased integration of ecosystem service considerations into its environmental management system. As staff members become more familiar and comfortable with the concept of ecosystem services, they will become more empowered to make decisions that improve both ecosystem health and the corporate bottom line.

CASE EXAMPLE: **Management review**

Members of Nissan's global management team conducted a high-level review of the company's dependence and impact on ecosystem services. The process heightened Nissan's attention to future water scarcity issues and enabled the company to institutionalize routine water risk assessments at facilities.

Source: Nissan 2010.

Question 7. *How can ecosystem service considerations be integrated into sustainability reporting?*

Corporate sustainability reporting allows a business to publicly communicate its environmental, economic, and social performance. With reporting, a company measures, monitors, and communicates its performance on specific sustainability issues of relevance to the company. Companies develop and publish sustainability reports for a variety of reasons, including to reduce exposure to potential business risk, improve internal management processes, and respond to requests from stakeholders and investors. Sustainability reporting can promote transparency and accountability by enabling stakeholders to track a company's performance and compare it with similar organizations. Furthermore, following the principle of "what gets measured gets managed," corporate sustainability reporting can improve a company's ability to manage—and accountability for managing—its impacts on the environment, society, and economic development.

The Global Reporting Initiative (GRI) Reporting Framework is the most widely used standard for corporate sustainability reports. In 2010, 1,875 companies published GRI-based reports, and even more are believed to have used the framework to inform their reporting without explicitly acknowledging GRI.[8] By setting guidelines on the content of corporate sustainability reports and the process for developing them, the GRI Reporting Framework enables companies around the world to assess and disclose information and performance indicators in a comparable way.

The GRI Reporting Framework and its "Sustainability Reporting Guidelines" provide a structure for firms to report on risks, opportunities, and strategic responses arising from a company's dependence and impact on ecosystems. Managers typically develop reports through an iterative process, the main steps of which are (a) defining the report's goals and its audience; (b) conducting a stakeholder engagement and materiality analysis to guide the report's content; (c) collecting data; and (d) writing the report. The reporting framework contains at least four guidance components into which ecosystem service considerations could be readily inserted: (1) materiality, (2) sustainability context, (3) organizational profile and strategy, and (4) performance indicators.[9]

1. Materiality

The GRI Reporting Framework recommends that the information in a company's sustainability report should cover topics reflecting the company's significant environmental, social, and economic impacts (GRI 2011). Consequently, managers need to determine which environmental impacts reach a threshold of materiality to warrant inclusion in the company's sustainability report. Managers can take a number of steps to ensure that the ecosystem service-related issues that are material to the reporting company are adequately identified. For example, managers can:

- Supplement the company's traditional list of environmental considerations—such as levels of air emissions, discharges to waterways, and freshwater consumption—with the list of ecosystem services in Table 1 (see question 1) and then ask two questions: (1) "Which of these ecosystem services does my company depend upon or impact?" (2) "Is this level of dependence or impact significant?" The ESR's Dependence and Impact Assessment Tool (see question 3, Figure 1) can help managers answer these two questions.

- Ask relevant stakeholders which ecosystem services that they depend upon are being impacted in terms of quantity or quality by the company. Ecosystem services valued by stakeholders but affected by the company are likely to be material and worthy to report. Stakeholders could include local communities, environmental groups, and civil society organizations, among others.
- Ask experts which ecosystem services are material to the reporting company. Experts could include academics, sustainability professionals within and outside the company, and representatives from nongovernmental organizations.
- Conduct an ecosystem services dependence and impact assessment to identify the reporting company's priority ecosystem services (see question 3). This approach encompasses and provides a structured approach for the previous three suggestions. The priority ecosystem services will be those that are the most material to the company and its stakeholders and should be those covered in the sustainability report.
- Conduct ecosystem valuation (WBCSD 2011) to quantify the financial implications of various ecosystem services to the reporting company. Those with the largest financial impact will be the most material.

Many of these steps are similar to those recommended for the aspects review component of ISO 14001 (see question 6). These steps are important; if priority ecosystem services are not identified, then issues material to corporate performance may be overlooked, unreported, insufficiently managed, and a source of potential business risk.

2. Sustainability context

The GRI Reporting Framework encourages businesses to report on changes in economic, social, and environmental conditions relevant to the reporting company and to disclose the company's contribution to these changes. Some of the environmental conditions and changes relevant to a reporting company are the status of and trends in its priority ecosystem services.

To ensure a sustainability report sufficiently captures these ecosystem service considerations, managers of the reporting company can use the ESR's Trends and Drivers Framework (Figure 2) to identify and assess trends in the priority ecosystem services (see question 3). The trends and drivers framework guides managers through the most important dimensions of understanding changes in the quantity and quality of relevant ecosystem services—including the company's scale of impact on those services, and that of other actors.

The GRI Reporting Framework's sustainability context highlights consideration of aspects that are particularly relevant to specific geographic areas. Many ecosystem services are inherently "local in nature." Firms operating in the same local area or region are likely to be facing the same ecosystem service challenges. The GRI principle of "sustainability context" requires the reporting organization to put the magnitude of its impact and contribution in an appropriate geographical context.

3. Organizational profile and strategy

The GRI Reporting Framework recommends that a corporate sustainability report include a description of the company's overall commitment to sustainable development and how the reporting company is responding to material environmental or social issues. Ecosystem service considerations can be incorporated into this organizational profile and strategy section in several ways. Examples include, but are not limited to:

- The summary statement from executive management can disclose the ecosystem service-related risks and opportunities the company faces and how the company is addressing them.
- The corporate sustainability goals and/or environmental policy can include commitments regarding those ecosystem services identified as priority ecosystem services for the company.
- The report can discuss the trade-offs between ecosystem services that arise with specific business decisions and why the company chose one outcome over another.
- Management can report on how the company is collaboratively engaging communities and others to reduce degradation of the ecosystem services that these stakeholders value or depend upon and that the reporting company impacts.

4. Performance and management indicators

The GRI Reporting Framework encourages companies to disclose—both quantitatively[10] and qualitatively—performance on all material issues and provides standardized performance indicators and metrics to do this. Effectively integrating ecosystem service considerations into sustainability reporting implies that companies disclose their performance vis-à-vis their priority ecosystem services.

The framework, however, currently does not provide metrics for the full range of ecosystem services. At the moment, the GRI environmental indicators address performance related to biodiversity—inputs such as water, energy, and materials, and outputs such as emissions, effluents, and waste (GRI 2011). While some of the provisioning ecosystem services may be covered by the "water" and "material" indicators, many of the regulating, cultural, and supporting ecosystem services are not covered by the standard GRI indicators and metrics.[11] Nevertheless, links between corporate performance and ecosystem services could be made if the reporting company were to explain how its inputs or outputs affect the state of an ecosystem(s) giving rise to a particular ecosystem service.[12]

Managers can go beyond GRI requirements to also report on their dependence on ecosystem services. But while there are indicators for corporate dependence on water, there are no indicators for corporate dependence on other ecosystem services. These gaps in the list of indicators can make it difficult for companies to generate sustainability reports that adequately reflect the possible risks and opportunities a company may face with regard to ecosystems.

The GRI is in the process of proposing indicators and associated metrics to support sustainability reporting vis-à-vis ecosystem services (GRI et al. 2011). Once the GRI process is completed, these gaps may be closed and reporting on business performance as it relates to ecosystem services could become easier and more standardized.

When providing qualitative information, reporting organizations can include reference to ecosystem services as they respond to GRI disclosure requirements on "Management Approach." This can be done with reference to what the GRI lists as "environmental aspects," in particular water, biodiversity, materials, emissions, effluents, and waste. To complement GRI's performance indicators, managers could also incorporate ecosystem service-related management indicators into their sustainability reports by stating responses to questions such as:

- Has the company systematically identified which ecosystem services it depends upon and/or impacts?
- If so, which services are they?
- Per priority ecosystem service, how is the company managing the risks and opportunities that might arise due to these dependencies and impacts?

Including this information in combination with environmental and social performance data could provide a more complete picture of how companies are protecting, managing, or restoring ecosystem services. It could also create opportunities for managers to strengthen the link between the company's performance and the consequent implications for ecosystem services.

Question 8. *What resources are available to help managers better integrate ecosystem service considerations into their business performance systems?*

There are a number of scientific assessments, tools, and working groups that can help business managers integrate ecosystem services into their business performance systems. Studies and methods that provide more in-depth information on the linkage between business and ecosystem services include:

- **The Millennium Ecosystem Assessment,** which provides a state-of-the-art scientific audit of the condition and trends in the world's ecosystems and ecosystem services, as well as a review of the drivers of ecosystem change (www.maweb.org).
- **The Economics of Ecosystems and Biodiversity Report for Business**—along with companion reports for the scientific community, national and international policy makers, local and regional policy, and citizens—is designed to draw attention to the global economic benefits of biodiversity and ecosystem services, to highlight the growing costs of biodiversity loss and ecosystem degradation, and to draw together expertise from the fields of science, economics, and policy to enable practical actions moving forward (www.teebweb.org).
- **The Corporate Ecosystem Services Review** is a structured method to develop business strategies to manage risks and opportunities arising from ecosystem change (www.wri.org/ecosystems/esr).
- **The Guide to Corporate Ecosystem Valuation** is a process to help managers make better-informed business decisions by explicitly valuing both ecosystem degradation and the benefits received from ecosystem services (www.wbcsd.org).
- **Other ecosystem service valuation tools** can help quantify the physical quantity and quality of ecosystem services, their location, and their economic value. Tools include InVEST, ARIES, ATEAM, EcoMetrix, and the Ecosystem Portfolio Model, among others. Managers should be sure to understand the assumptions underlying the models they use and check results against the company's specific circumstances.
- **New Business Decision-Making Aids in an Era of Complexity, Scrutiny, and Uncertainty: Tools for Identifying, Assessing, and Valuing Ecosystem Services** is a review and summary of vetted ecosystem services assessment tools and models, each pertinent to different business decisions (www.bsr.org).
- **Examples of business risks and opportunities from ecosystem change** is a frequently updated PowerPoint containing more than 60 case examples that illustrate the breadth of strategies companies can take to create value by reversing ecosystem degradation (www.wri.org/project/ecosystem-services-review/tools).
- **Ecosystem Services Benchmark** is a method for evaluating ecosystem service-based risks for financial investors (www.naturalvalueintiative.org).

There are a number of efforts to integrate ecosystem service considerations into business performance systems. For example:

- **The Global Reporting Initiative** with its G3.1 Guidelines include indicators on some aspects of biodiversity and ecosystem services. The GRI is investigating further guidance on measuring and reporting on business performance related to ecosystem services (www.globalreporting.org).

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- **The International Finance Corporation's (IFC)** *Performance Standard 6 – V2 Biodiversity Conservation and Sustainable Management of Living Natural Resources* provides guidance to potential clients on how to provide information on a project's ecosystem services impacts (www.ifc.org).
- **UNEP World Conservation Monitoring Centre** produces and updates common ecosystem services evaluation methods, which are especially useful to corporate managers in setting baselines and monitoring trends that have implications for performance (www.unep-wcmc.org).

- **ISO 26000 Guidance on Social Responsibility** provides guidance on implementation of good practice in social responsibility worldwide. This is the first ISO standard to explicitly highlight ecosystem services, covered along with biodiversity as an issue in the "Environment" section of its core subjects chapter (www.iso.org).
- **UNEP SETAC Guidelines of Life-Cycle Assessment of Products** is developing a series of life-cycle inventory and assessment methods, including new guidance on integrating ecosystem services and biodiversity considerations (http://lcinitiative.unep.fr).
- **Ecosystem Services Review for Impact Assessment** is developing a set of guidelines for incorporating ecosystem services into environmental and social impact assessment, in a way that meets the IFC's new performance standards (www.wri.org).
- **Business for Social Responsibility's Ecosystem Services Working Group** focuses on emerging risks and opportunities associated with corporate reliance on, impact on, and revenue opportunities from ecosystem services and environmental markets. The group tracks the emergence of new environmental performance expectations associated with ecosystem services (www.bsr.org).
- **UNEP Finance Initiative Biodiversity Work Stream** involves experts from financial institutions and other institutions in the development of tools to guide managers from the banking and investment community. The initiative is collaborating with Fauna & Flora International under The Natural Value Initiative (www.unepfi.org).

Other business and ecosystem services resources are available at www.wri.org/ecosystems/esr.

There are also several professional networks focusing on business and ecosystem services that connect managers, consultants, and ecosystem experts to share lessons learned and collaborate. For example:

- **The Ecosystem Services Experts Directory** includes a wide range of noted experts on ecosystems and ecosystem function willing to provide specific guidance on particular ecosystem trends or environmental management practices (http://projects.wri.org/ecosystems/experts).
- **Business & Ecosystem Services Professionals Group** is a LinkedIn group allowing members to share lessons learned and best practices, start discussions, and connect with peers about pressing issues at the nexus of business and ecosystems (www.linkedin.com).
- **World Business Council for Sustainable Development's Ecosystems Focus Area** produces business decision support tools such as the *Guide to Corporate Ecosystem Valuation* (2011), provides capacity-building material, and generates case studies for businesses to consider ecosystem services and ecosystem change, while also providing business input into policy debates (www.wbcsd.org).

NEXT STEPS

This publication provides some introductory guidance on how to integrate ecosystem service considerations into existing business performance systems. But arguably the best way for business managers to learn how to do this is to learn from each other. An important next step, therefore, is for companies to publicly share their experiences, addressing how they integrated ecosystem service considerations, what obstacles they faced, how they overcame them, how business performance changed, and what business benefits were achieved. These case examples can be shared with peer companies via industry associations and the professional networks listed under question 8.

In 2008, WRI noted, "Climate change may dominate headlines today. Ecosystem degradation will do so tomorrow" (Hanson et al. 2008). Since then, the world has witnessed massive flooding in South Asia and the central United States, vast wildfires in Russia, water crises in Australia, and many other challenges. The confluence of climate change, ecosystem degradation, population growth, and rapid economic development in many regions demonstrates that the business conditions of the past half century will not be the same as those of the next. For businesses to be prepared, they increasingly will need to account for nature in performance.

Notes

[1] Other related terms in use include "natural capital" and "environmental services". This publication follows the definitions and applications defined by the Millennium Ecosystem Assessment.

[2] The Millennium Ecosystem Assessment was a four-year international audit of ecosystems that involved more than 1,360 scientists, economists, business professionals, and other experts from 95 countries. Its findings provided the first state-of-the-art scientific evaluation of the condition and trends of the world's ecosystems and the services they provide, as well as the scientific basis for action to conserve ecosystems and use them sustainably. For more information about the Millennium Ecosystem Assessment, see www.maweb.org

[3] See pages 24-28.

[4] In addition, the Dependence and Impact Assessment Tool can help managers determine which ecosystem services are of most relevance to stakeholders.

[5] The ISO 14001 is part of the ISO 14000 series that includes more than thirty standards for environmental management systems (14001, 14002, 14004), environmental auditing (14010, 10411, 14012) environmental performance evaluation (14031), life-cycle assessment (14040-14043), labeling and product claims (14020-14025), environmental communications (14063), and greenhouse gas inventories (14064). As a group, they provide companies a large suite of internationally accepted guidelines for corporate environmental management. More information can be found at http://www.iso.org/iso/iso_14000_essentials

[6] Even more firms have used ISO 14001 but have forgone the costs of certification and therefore are not registered as ISO 14001 compliant and cannot be publicly tracked as such. More information can be found at www.iso.org/iso/survey2008.pdf.

[7] Excluded from the figure are administrative components of ISO 14001 such as record keeping, document control, training, and communications that are important for internal controls and audits. These components would not change if ecosystem service considerations were enhanced in ISO 14001 and therefore are not analyzed in this publication.

[8] GRI, in collaboration with the UNEP's World Conservation Monitoring Center and the Dutch consultancy CREM, is exploring the formal integration of ecosystem service consideration into the GRI Framework. Their efforts aim to consider, among other things, the lack of consensus on (a) what specific ecosystem services indicators should be used in standard disclosures, (b) the science of ecosystem services, (c) how to handle existing data gaps, and (d) how to aggregate indicators of ecosystem services. See Global Reporting Initiative. *GRI Report List 1999-2011*. Available at: http://www.globalreporting.org/ReportServices/GRIReportsList/reportslist.htm (Accessed August 24, 2011.)

[9] These four components are included—to some degree—in other sustainability reporting guidelines such as the *UK's General Guidelines for Sustainability Reporting* or topic-specific reporting guides such as the *Carbon Disclosure Project*. Recommendations in this publication may be applicable to these and similar guides, as well.

[10] Quantitative ecosystem service indicators at the site or facility level will likely be easier to gather and generate than aggregated measurement across the entire corporation.

[11] Some are considered, however, in the industry sector supplements. The supporting ecosystem service of "habitat" is partially included in the GRI environmental aspect of "biodiversity" and its five indicators, but these indicators focus on protected areas and endangered species.

[12] Personal communication. Sean Gilbert. July 30, 2011.

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