The dangers of over-extending financial capital are front of mind for many board directors today as they seek growth without risking long-term viability. But ask most boards to assess the natural wealth of their business, and the risks posed by its depreciation, and a less than confident answer might be expected.

All businesses depend on and impact ‘natural capital’. This is a term used to describe all aspects of the natural world that provide benefits to people. Many organizations do not fully appreciate their relationship with natural capital, and therefore are missing out on opportunities for improved performance or failing to address potentially significant risks.

In this article Arcadis draws on its global experience to demonstrate how incorporating natural capital considerations into strategic and tactical decision making can yield significant commercial, monetary, and reputational benefits. Our insights have relevance for all industry sectors and all stages of the value chain.

**WHAT IS NATURAL CAPITAL?**

The term ‘natural capital’ refers to the ‘stock’ or ‘inventory’ of physical attributes in the natural world such air, land, water, flora and fauna, and the direct and indirect ‘services’ that these provide. These include ‘provisioning’ services (production of food and water purification), ‘regulating’ services (carbon sequestration and coastal resiliency), ‘supporting’ services (nutrient cycles and crop pollination) and ‘cultural’ services (spiritual and recreational benefits).

The total global amount of natural capital continues to decline as cumulative levels of exploitation and pollution start to exceed environmental tipping points. Most of what remains, and many of its related benefits, are undervalued even though they have the potential to impact every organization.

Proactive management of natural capital provides opportunities, whereas a lack of management generates risks, ultimately impacting on shareholder value. Utilizing natural capital to improve business performance and the environment is surely a win-win that every good corporate citizen should strive for.

**HOW CAN NATURAL CAPITAL AFFECT YOUR BUSINESS?**

Amongst all the issues competing for attention at the board and management level, the opportunities and risks associated with natural capital deserve serious consideration.

Businesses are one of the main consumers of natural capital and changes in stocks of natural capital can have profound effects. The United Nations Environment Program for Financial Institutions study estimates that over 50% of current company earnings may be at risk from changes to the environmental cost base.

This realization that our natural capital is limited, is driving a number of important trends relevant for business:

- **Minimizing consumption of scarce resources**: Businesses are using natural capital principles to incorporate a broad understanding of risks and dependencies in their sourcing strategy. This can lead to changes in choice of materials or product pricing, development of new products and opportunities for competitive differentiation;
• Responding to new regulatory obligations: Understanding and managing impacts and dependencies on natural capital helps businesses to comply with growing non-financial reporting requirements such as those arising from EU Directive 2014/95/EU on non-financial reporting, the Global Reporting Initiative, International Integrated Reporting Council, Dow Jones Sustainability Index, and the Climate Disclosure Standards Board. These will require businesses to report on natural capital assets and liabilities, and to anticipate increasingly strict legislation protecting aspects of natural capital;

• Enhancing natural capital while boosting asset resilience and reducing operational costs: Using natural capital principles in the planning and design of assets can promote the function, stability and climate change resilience of those assets at the same time increasing natural capital value. Similarly, natural capital benefits can be realized while improving the operational performance of existing assets;

• Optimizing the financial and natural capital value of real estate: Mapping the natural capital value of real estate can support the identification of opportunities for strategic retention or divestment. Either approach can add value to businesses while expanding the global quantities of natural capital preserved for beneficial use;

• Managing evolving stakeholder expectations: Acknowledging and managing the impacts and dependencies on natural capital is supporting companies with meeting the expectations of stakeholders regarding responsible consumption and production, such as reduced carbon emissions, sustainable freshwater use and prevention of pollution;

• Ensuring continued access to finance: Adopting natural capital principles is increasingly important for businesses and projects that are reliant on external sources of finance. Following the 2012 update of the International Finance Corporation (IFC) Performance Standards many project seeking finance from an Equator Principles signatory organization is now required to demonstrate that it will result in ‘no net loss’ of critical ecosystem services. Similarly, financial institutions that have signed up to the ‘Natural Capital Declaration’ are specifically seeking to understand those assets at the same time increasing natural capital value. These will require businesses to report on natural capital assets and liabilities, and to anticipate increasingly strict legislation protecting aspects of natural capital.

Leading global corporations like Dow, Unilever and Kering acknowledge these trends and are already formulating corporate strategies for managing natural capital risks and opportunities. Throughout this article we look through the lens of natural capital to demonstrate how actively responding to these trends during the planning, creation, operational and decommissioning phases of the asset lifecycle can deliver real benefits for business and the natural world that we all depend on. This can be visualized by following the value chain from raw material production, transport and energy transmission to manufacturing and then to the cities where many consumers reside, to demonstrate that natural capital risks and opportunities exist all along this path.

1. STRIKING A BALANCE IN THE EXTRACTIVES SECTOR WITH NATURAL CAPITAL ASSESSMENTS

The extractives sector (including mining and oil and gas exploration activities) has fueled much of the world’s economic growth and development over the years and contributed to the quality of life we all appreciate today. However, this has often been at the cost of declines in local and regional natural capital. As a result the sector is often both heavily regulated and under constant stakeholder scrutiny. Better understanding of natural capital considerations extends additional opportunities of planning, creating, operating and decommissioning assets that can genuinely support the sector in securing a more sustainable future and enhanced reputation.

Where projects are seeking access to international finance they are especially subject to requirements to demonstrate ‘no net loss’ (NNL) of natural capital (mostly in the form of ‘biodiversity and ecosystem services’ or ‘water’). By understanding the present and potential natural capital value of the assets under an organization’s control early in the planning phase, such obligations can often be discharged without significant additional financial investment in mitigation, restoration or compensation.

For example, Arcadis is working on proposals for a Canadian oil and gas company to use natural capital considerations as part of the development process. The intention is for natural capital to provide a ‘single currency’ for quantifying diverse baselines and impacts that will allow the organization to demonstrably, but cost-effectively, meet NNL requirements through targeted improvements to key ecological resources within its larger portfolio. This approach is anticipated to ensure regulatory and financing obligations are met while also addressing stakeholder expectations and optimizing operating costs.

Natural capital considerations can also highlight critical risks within the construction, operating or redefining phases of assets. For example, applying a ‘shadow pricing’ approach to water that reflects its local scarcity can support mining organizations with understanding the level of political and regulatory risk to which their local operations are exposed on this issue, as well as identify opportunities for investments to reduce that risk. Knowledge such as this enables businesses to take steps to address very substantial risks that may have previously been unrecognized.
In the operating and redefining stages of an asset, natural capital considerations can also be used to help optimize the value of corporate land holdings, which are often very substantial in the extractives industry. Many companies own natural capital in their portfolios, and we support them with executing strategies to unlock its hidden value. This can be in the form of recognizing the water filtering and flow control service performed by healthy woodland or opening some aspects of the sites to create recreational service value. Value can be also generated during site divestment. For example, in North America, donation of natural capital for preservation into perpetuity (e.g. creating riparian corridors or protecting valuable water resources) can generate both monetary gains as well as indirect benefits such as offsetting potential environmental liabilities or mitigation requirements. Ultimately, this can translate into enhanced corporate reputation, greater profitability and increased shareholder value.
75% of the leading food crops are dependent on animal pollinators.

**2. USING NATURAL CAPITAL TO PROMOTE ECOSYSTEM HEALTH IN AGRO-INDUSTRY**

The agro-industry sector arguably relies more heavily on healthy ecosystems (including clean water and soil fertility) than any other sector. Under increasing threat from intensification due to population expansion, exacerbated by climate change, issues such as loss of pollinator services are a huge threat to the industry. As an example, 75% of the leading food crops are dependent on animal pollinators, and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) estimates that that over US$500 billion worth of annual output depends on this.

The sector is responding to these risks by increasingly integrating natural capital considerations into its decision making processes for implementing farm management practices. For example, enhanced soil health and assured long-term productivity can be achieved through measures such as increased use of natural pest control, green fertilizers, the creation of multifunctional field margins (i.e. buffer strips), reduced water consumption and pollution at catchment level, reduced soil tillage and overall reduced cultivation efforts. Measures such as these are not only beneficial to the agro-chemical industry, but also to the farmers and to wider society as they deliver resilience, maximize land value, manage resource scarcity and minimize operational costs.

Putting this into action, Arcadis helped a major dairy company to align their evolving biodiversity strategy with two major best practice international initiatives: the Natural Capital Protocol (NCP), and two reports on assessing livestock impacts on biodiversity published by the Livestock Environmental Assessment and Performance (LEAP) Partnership of the United Nations (Food and Agriculture Organization; FAO). Rather than choosing a top-down approach, this strategy uses the practical reality of the dairy farmer by offering them clear guidance on how to reduce the pressure of their activities on biodiversity. To make this pressure tangible, a methodology was developed involving nine pressure factors, which dairy farmers can measure and reduce by taking appropriate measures. This provides dairy farmers with a perspective for taking actions. By ensuring that their biodiversity strategy is in line with the NCP and the FAO LEAP method, the dairy company aims to have a transparent and visible approach for natural capital conservation, enabling them to make credible statements regarding sustainable dairy.

**3. ENABLING COST-EFFECTIVE INFRASTRUCTURE DEVELOPMENT AND OPERATION BY WORKING WITH NATURAL CAPITAL**

Growing urbanization is driving the need for major transport and utility infrastructure development in increasingly crowded settings. These are often characterized by great stakeholder interest and high land values. At the same time, existing infrastructure is creaking under the strain of unforeseen levels of demand, downward operational cost pressure and damaging effects of climate change. This puts at risk the satisfaction of end users and shareholder value.

Adoption of mitigation approaches based on natural capital valuation can help to minimize land take and expedite planning consents for new urban infrastructure. This works by, for example, monetizing the value of each ecosystem service according to habitat types (e.g.: grasslands, woodland, wasteland, ponds, trees and shrubs) on site so that the net effect on biodiversity and ecosystem function of the development can be evaluated.

In the case of transport for London’s proposed Silvertown Tunnel under the River Thames, Arcadis has been able to demonstrate a mechanism that secures a net gain in biodiversity while maintaining and enhancing soil and water regulating functions. This has been achieved through a combination of onsite mitigation and off-site compensation. Following planning determination, this will reduce project costs by avoiding the need to acquire very expensive adjoining land with complex ownership issues, thus supporting land value. It will also help manage stakeholder expectations and deliver regulatory obligations that are critical to securing the necessary planning approval. All this can be achieved while maximizing the benefits to biodiversity and maintain a healthy soil and water system.

Intelligent management of natural capital can also deliver substantial benefits for management of existing infrastructure. In Germany, the award winning Life Elia project has resulted in creation of natural wetland features along the corridor of electrical transmission lines in forested areas. This encourages the growth of plants that do not grow as rapidly to not interfere with the overhead lines, resulting in a long-term reduction in maintenance costs while enhancing natural capital value through a diversification of ecosystem services (such as flood and water quality
attenuation) and increased biodiversity to enhance ecosystem function, stability and resilience. Railway network operators are increasingly at risk from infrastructure damage and service disruption resulting from extreme flooding events resulting from climate change. Arcadis is working with rail companies in the UK to develop vegetation planting solutions that aids stabilization of earthworks, increasing resiliency, and helps attenuate storm water without adding to leaf fall issues that can cause operational delays. This approach makes rail operations more resilient while ensuring no net loss of biodiversity.

4. UNDERSTANDING NATURAL CAPITAL IN MANUFACTURING

The manufacturing industry is heavily dependent upon a sustainable and resilient value chain. In recognition of this, several leading organizations are exploring the risks and opportunities associated with their direct and indirect natural capital dependencies and impacts. These can arise in how materials and services are sourced, how goods are produced and how goods are distributed.

From our work developing natural capital action plans and strategies for manufacturers as diverse as chemical, cement, steel, furniture and food producers, it is clear that the complexity of many value chains poses challenges, and many assessments are too high-level to offer perspective for formulating meaningful actions. But, by including natural capital considerations into their purchasing strategies, organizations can ensure resource security (perhaps by changing source entirely or adding circular economy thinking) and safeguard their productivity and efficiency. They can boost their sustainability reputation along with that of their suppliers, customers and investors. This in turn provides competitive differentiation and addresses growing expectations from customers’ and investors for sustainable products and services.

Based on this above, many businesses will conclude that incorporating natural capital considerations into a value chain strategy is a must in order to capitalize on opportunities and minimize risks. Adding to the case for action is increasing evidence of policy focus on reducing natural capital impacts in the upstream parts of the value chain. For example, the European Commission appointed Arcadis to study biodiversity impacts arising from commodity imports to the EU. This focused on soy from Brazil, bovine meat from South America, cotton from India, fisheries products from Madagascar and gold from Papua New Guinea. For each commodity the supply chain and the related impacts on biodiversity were investigated. Based on this outcome recommendations were formulated on how EU policy intervention could be most effective in reducing biodiversity impacts and the risks associated with them.

Manufacturers also have the opportunity to make a big difference to natural capital with how they develop and operate their own facilities. By setting an ambition such as NNL of natural capital, and a protocol by which to reliably and pragmatically score of natural capital before and after facility development, manufacturers can gain confidence in achievability of their ambition and a clear way of assessing the outcome.

Arcadis recently supported a major sporting goods manufacturer in aiming for NNL on biodiversity. We used and adapted the USA-based Habitat Equivalency Analysis (HEA) method to quantify ecosystem services and the resulting biodiversity and set-up a NNL methodology. HEA is a scientifically validated and widely-accepted approach for quantifying the ecosystem services provided by habitats. The NNL methodology enabled us to determine which ecosystem services would support the biodiversity measures that were needed to meet the client’s ambition for reaching biodiversity net gain, and demonstrated that including nature-based water management solutions in the design resulted in an overall cost reduction compared to ‘traditional’ grey infrastructure solutions. To ensure that the biodiversity metrics were achieved, we set-up a monitoring program together with a regional non-governmental organization.
5. THE USE OF NATURAL CAPITAL PRINCIPLES TO DELIVER SUSTAINABLE URBAN DEVELOPMENT

The real estate sector controls very large land holdings and therefore has a high impact and dependency on natural capital. Embracing natural capital concepts can reduce construction costs, accelerate the planning approval process, ensure climate change adaptation and add to operational resilience.

For example, on the landmark NW Bicester EcoTown development by A2Dominion on greenfield land near London, Arcadis designed the green infrastructure around which the masterplan was developed to maximize the natural capital benefits and reduce operational dependencies while delivering a net gain in biodiversity. Net gain was achieved by demonstration of biodiversity value using metrics required by the Department for Environment Food and Rural Affairs (Defra).

Our approach retained existing landscape features with high natural capital value and improved this further with multi-functional ‘green’ (planted) and ‘blue’ (water) natural infrastructure. This resulted in better stakeholder relationships and delivery of regulatory obligations that accelerated the planning approval process. It also reduced development costs and minimized future maintenance requirements through enhanced asset resilience. For residents, benefits included reduced overall water and energy consumption and a healthier place to live. So much so that the UK Government recently name NW Bicester EcoTown as one of just ten ‘Healthy New Towns’. The overall effect has been to boost the developer’s (A2Dominion) brand profile and the project’s value.
6. UNDERSTANDING THE FINANCING IMPLICATIONS OF NATURAL CAPITAL

Given its role, the financial sector is exposed to all of the above, which can create legal liabilities, credit risks, market and cash flow volatility, and reputational, regulatory and portfolio risks.

A recent study by McKinsey Global Institute revealed that almost one third of profit warnings from Financial Times Stock Exchange Index (FTSE) companies are linked to changes in raw material costs associated with resource scarcity, while other work by EY showed that if regulatory obligations changed and companies were required to pay for their environmental externalities this would wipe out up to 50% of present company earnings in a standard equity portfolio.

Many areas of project (and corporate) finance are also affected by natural capital. As outlined earlier, any project financed by a signatory to the Equator Principles is expected as to be able to demonstrate NNL of biodiversity and ecosystem services. Projects (and increasingly businesses) seeking access to finance must be aware of this from the outset, as failure to address this can lead to significant financing delays. For example, for the last few years Arcadis has been acting as the Independent Environmental and Social Consultant for the Financing of the Yamal LNG project in northern Russia; resolution of natural capital issues on this large extractives project has been a key area of focus.

Natural capital also creates opportunities for the financial institutions. The ‘green finance’ agenda continues to grow and now includes a diverse range of ‘impact investments’ designed to specifically support natural capital initiatives as well as ‘Green Bonds’ that seek to bundle long-term financing in support of the broader environmental and social agenda. As stakeholder expectations increase, and markets grow, these can lead to significant returns on investment.

HOW SHOULD BUSINESS RESPOND?

As these examples make clear, any business seeking to benefit from the natural capital approach must start with a solid understanding of the dependencies and impacts that they and their value chain have on natural capital, including the services it provides.

We advocate a robust materiality assessment to ensure focus on strategic risks and opportunities such as business continuity, growth and profitability. A programmatic approach can then be adopted to delivering specific natural capital enhancement opportunities where quantifiable returns on investments can be calculated and monitored. This can be delivered at a range of levels including:

- **Corporate Strategy:** Anticipation of changes in market trends, increasing brand value, attenuating climate change impacts, delivering regulatory obligations, managing resource scarcity, securing access to finance and product innovation
- **Maximizing Asset Value:** Maximizing the value of site-level natural capital inventories which deliver greater estate value (both in terms of retail value and operational efficiency), optimized consents and approvals processes by delivering regulatory obligations, and efficient design of green infrastructure which leads to asset resiliency (e.g. to manage storm and wastewater)
- **Value chain:** Increased management of resource security, productivity and efficiency, enhanced sustainability and maximizing brand value by managing stakeholder expectations by meeting customers’ demands for sustainable products and services
- **Financial Investors:** Demonstration of reduced portfolio risks, pre-empting of regulatory changes, attraction of new clients and enhanced rates of return from new opportunities.

As the global stock of natural capital continues to decline, such consideration will increasingly affect corporate decision-making and business value. While the challenge of including natural capital into the process may seem daunting at first, the short and long term benefits are clear.
ARCADIS IS A LEADER IN THE WORLD OF NATURAL CAPITAL

Arcadis is a global environmental, design and advisory business of 27,000 people. We strive to improve the quality of life by maximizing social, environmental and economic value for all generations through delivery of exceptional and sustainable outcomes for projects in the built and natural environment.

Our commitment to creating a sustainable future is demonstrated through several initiatives that support our client work, of which a selection is described in this article. We are active members of the World Business Council for Sustainable Development, with a focus on sustainable cities, natural capital and water. We are also members of the Natural Capital Coalition (NCC), and have contributed heavily to NCC’s development of the Natural Capital Protocol (NCP) through co-authorship, consultation facilitation, pilot testing and the provision of pro bono seconded staff acting as NCP’s Relationship Manager. Released in July 2016, this is an excellent example of a business-based framework for assessing, demonstrating and managing opportunities and risks using the natural capital approach.

While actively contributing to the Dutch online Helpdesk Natural Capital, the development of the Dutch national natural capital training for small medium enterprises, (SMEs), and capacity building for the Indian Business Biodiversity Initiative (IBBI) including development of natural capital action plans and strategies for its members gave us a unique perspective on how businesses across many sectors and stages in the value chain can seize the opportunities and avoid the risks associated with natural capital.

Our contribution to the Dutch Green Deal “Transparency Natural and Social Capital”, together with 21 other Dutch businesses, the government and NGOs and resulting in the publication “It pays to be transparent” indicates we not only support our clients in identifying their relation with natural capital but also focus on it for ourselves.

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