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Corporate Sustainability and Environmental Stewardship in Africa: Strange Bedfellows?

By

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Abstract

A key dimension of environmental sustainability and the push for a green economy in Africa focuses on how businesses can sustain their economic operations while addressing their natural resource conservation responsibilities. This paper explores the major discourses on the challenges and opportunities that the private sector faces as it grapples with the natural resource conservation imperative as well as the broad range of key issues, evident in the business and environmental stewardship landscape. The major intention is to improve understanding regarding the decision-making space and competitive predisposition of a firm as it responds to the call for more innovation and transformation in the face of a rapidly declining natural resource base. Through detailed review of the published literature and pointed reference to the South African context, the paper establishes that a critical factor contributing to the rapid degradation of natural resources is that their value is rarely taken fully into account by economic signals in markets, or in day-to-day decisions by the business sector and citizens. As natural resources, biodiversity and ecosystem goods and services decline, business value is destroyed and in the process, the limits to future growth opportunities become more pronounced. The paper concludes that by addressing corporate environmental responsibility and stewardship, a proactive organisation will put in place the appropriate 'hard' and 'soft' infrastructure for research, innovation and investment in eco-efficient technologies to tackle some of the challenges evident in this landscape. Indeed, corporate sustainability and environmental stewardship can no longer be viewed as the strange bedfellows that they have traditionally been considered to be. Instead, given the right conditions, the two can co-exist in harmony.

Key Words: *corporate sustainability; environmental stewardship; mainstreaming; decision-making; economic valuation*

1. Introduction

Understanding regarding the corporate sustainability and environmental stewardship landscape in South Africa and the rest of the African continent is still in its infancy and the quest for new knowledge in this domain remains paramount. This is made more pertinent by the fact that degradation of biodiversity and the broader basket of the earth's natural resources has already been recognized as a key challenge in development policy and practice for several decades now. This degradation is escalating and occurring at a faster rate in Africa as various countries and companies expand and intensify their economic production activities. In essence, economic growth and limitations in integrating environmental concerns into development planning have put increasing pressure on natural resources across Africa and other parts of the world. It is now widely understood that many economic production activities negatively impact well-functioning natural ecosystems while at the same time being dependent on them. Therefore, the constant decline we are currently witnessing in the world's natural resources poses significant challenges to the business sector, public policy and society at large.

The big challenge is to determine how best to create enduring socio-economic opportunities for a growing population while ensuring public and private sector environmental stewardship. Relying on detailed review of the published literature and documented case studies derived from company reports and interviews carried out with relevant departments in various companies, this paper critically explores the major discourses and narratives prevailing in the emerging field of business and environmental stewardship. The paper highlights key areas of focus for corporate environmental responsibility and stewardship in Africa. The major intention is to improve understanding regarding the decision-making space and competitive predisposition of a firm as it responds to the call for more innovation and transformation in the face of a rapidly declining natural resource base. The paper is also targeted at theorists and practitioners who grapple continuously with the challenges evident in the environmental stewardship landscape.

2. The Nexus

2.1 The environmental degradation challenge

Most of the prevailing projections of the earth's environmental profile and natural resource-use patterns paint a disturbing picture of increasing ecosystem degradation and natural resource depletion. The UN Millennium Ecosystem Assessment – a four-year appraisal of the Earth's ecosystems completed in 2005 – found that 60% of the world's key ecosystem services have been degraded over the past 50 years, mostly due to factors such as land-use change, resource over-exploitation, pollution, invasive species and climate change (MA, 2005). The Assessment also established that over the past 50 years virtually all ecosystems have been rapidly transformed by human actions (and this is worse in developing countries), causing between 50 and 1000 times more natural habitat and species extinctions in the last 100 years than would have happened due to natural processes (MA, 2005; FAO, 2010).

Since 1900, the world has lost about 50% of its wetlands and there is still increasing pressure for the conversion of tropical and sub-tropical wetlands to alternative land-uses (Moser et al., 1996). Some 30% of coral reefs, which frequently have even higher levels of biodiversity than tropical forests, have been seriously damaged through fishing, pollution, disease and coral bleaching (Wilkinson, 2004). In the past two decades 35% of mangroves have disappeared. In some countries up to 80% of mangroves have been lost through conversion for aquaculture and over-exploitation (MA, 2005). More recently, *The Economics of Ecosystems and Biodiversity* (TEEB), a global study on the costs of biodiversity loss and ecosystem degradation, estimated that the world is losing natural capital worth between Euro 1.35 trillion and 3.10 trillion every year, based on deforestation only (WBCSD, 2012).

Figure 2: Critical inter-dependencies

	Industrial Trends	Impacts &/ dependencies	Risks & opportunities
Energy	Between 80 and 90% of total worldwide energy is currently derived from the combustion of fossil fuels, with the remainder from nuclear energy and renewable sources that include biomass, hydro-, wind and solar power. In 2008, renewable energy supplied around 7% of the world's energy consumption, but this sector is experiencing considerable growth. Between 2004 and 2008, global production of ethanol more than doubled, and biodiesel increased six-fold.	**Climate change:** CO2 released from the burning of fossil fuels in all industries accounts for 57% of greenhouse gas emissions **Habitat loss and degradation:** Biofuel production can cause a loss of important natural habitats for biodiversity, and hydropower can have severe impacts on both aquatic and terrestrial biodiversity through reservoir inundation, flow manipulation and river fragmentation.	**Regulatory risk:** Increasing requirements for redress through the EU Liability directive, in some countries such as Brazil or the USA a requirement to offset or compensate for impacts. **License to operate:** Strong relationships with regulators can result in acquiring an agreement to operate more rapidly.
Mining	Mining activities continue to expand into sites that are ecologically valuable where the potential for significant negative impacts and associated risks is greater. Much development is in developing countries where environmental regulatory controls and associated governance processes may be weak.	**Land conversion:** Open cast mining or the development of roads that open up previously inaccessible areas alter the geography and historical use of land. **Pollution:** Large quantities of solid waste (tailings) are often produced in the processing of metal ores, where the target metal is usually present at a low concentration. The storage of this waste can damage or destroy underlying habitats and geological features.	**Regulatory risk:** Increasing requirements for redress through the EU Liability directive, in some countries such as Brazil or the USA is a requirement to offset or compensate for impacts. **License to operate:** Strong relationships with regulators can result in more quickly obtaining agreement to mine.
Fisheries	Declining fish populations have caused a shift to fishing in deeper waters and for previously unexploited fish species as traditional stocks decline. Aquaculture now accounts for 47% of the world's fish food supply and is growing. Changes in dietary patterns have increased demand for fish; this will continue to increase with a rising human population.	**Dependence:** The productivity of wild fisheries is dependent on the health of marine and freshwater ecosystems, as well as the diversity of species available for capture. **Over exploitation:** As much as 90% of the ocean's large fish have been fished out, and 28% of the world's commercial marine fisheries are overexploited, depleted, or recovering from depletion. **Loss of important habitats and services:** Loss of mangroves through clearing for shrimp farms can cause loss of natural defences from storms and a loss of fish nurseries.	**Market access:** Markets for fish may become increasingly restricted as many major supermarkets have made commitments to sustainably source fish.
Cosmetics	At present, most cosmetic products are made using ingredients derived from petrochemicals. However, growing consumer concern about synthetic chemicals has seen the natural and organic sector emerging as the fastest-growing cosmetics sector over the past few years.	**Dependence:** The natural and organic sector of the cosmetics industry is dependent on biodiversity for continued supplies of plant-derived ingredients. **Over exploitation:** Over-harvesting of wild species as sources of raw materials presents a threat to these species. Examples include a sandal-wood species in Indonesia (*Santalum album*) and rosewood in Brazil (*Anibarosaeodora*), which are harvested to produce oils used in perfume.	**New markets:** Growing consumer preference for natural cosmetic products is creating market opportunities for products certified as organic, natural and sustainably produced. **Company image:** The majority of cosmetic product consumers would be willing to stop buying products from cosmetics companies that are not materially committed to ethical sourcing of biodiversity.
Tourism	The number of international travellers has been forecast to reach over 1.5 billion globally by 2020. Tourism will become increasingly important in developing countries hosting biodiversity hotspots, particularly those in Southeast Asia. A large percentage of new tourism facilities are likely to be built in areas of high biodiversity where strong legal and regulatory frameworks for biodiversity conservation are often lacking.	**Dependence:** Strong dependence on biodiversity and ecosystem services to, for example, control disease and natural hazards, purify water and regulate climate. **Land conversion:** Loss of natural habitat from construction of hotels/ golf courses etc. (both from land occupied and construction materials) **Climate change:** Tourism is responsible for around 5% of anthropogenic greenhouse gas emissions, particularly from aviation.	**Brand differentiation:** Securing new customers through strong environmental credentials. **New revenue streams:** Nature-based tourism is now a major component of export income in many countries. Ecotourism is around 7% of the market.

Source: UNEP, 2010

Human induced climate change, as well as a growing human population and continued economic expansion will further exacerbate ecosystem degradation and biodiversity loss. Southeast Asia, the Congo Basin and parts of the Amazon are expected to suffer the greatest losses (UNEP, 2010). This loss forms a major barrier to sustainable development in these regions and around the world. Damage to biodiversity has been estimated to cost the global economy more than US$500 billion per year (ibid). The statistics presented above highlight the fact that a large percentage of ecosystem degradation and biodiversity loss is attributable to anthropogenic factors as various countries try to meet rapidly growing demands for food, water and related resources (see TEEB Report, 2008). Therefore, the intricate relationship between human welfare and ecosystems is increasingly being understood in ecological and economic terms. In effect most development processes that interact with or depend on exploitation of ecosystem goods and services tend to negatively tilt the ecological balance. And yet ecological balance is one of the three pillars of sustainable development and without it business cannot effectively function.

Human knowledge of the biophysical and socio-economic dimensions of the business and natural capital nexus is also improving fast. Most of the dominant scholarship in the field fully acknowledges that natural capital is threatened by human development processes that exploit or simply disturb the environment and its resources (see Barna, 2008; WRI, 2008; TEEB, 2009; Rands et al. 2010; WBCSD, 2011). The published literature also indicates that as ecosystem goods and services decline, business value is destroyed and in the process, the limits to future growth opportunities increase (see Sala et al., 2000; UNEP, 2010; WBCSD, 2011). Therefore, in both theory and practice, there is growing awareness of the impact and dependency that business operations have on ecosystem goods and services and the business risks that poor management of the environment can present (Schaltegger & Beständig, 2012). As a result, the high rate of ecosystem degradation and natural resource loss poses significant challenges to business, public policy and society at large. It has indeed become a key topic in international sustainable development discourses (including at the Rio+20 Summit in Brazil). Figure 1 summarises some of the critical business and biodiversity interdependencies confronting development theory and practice.

2.2 The corporate sustainability challenge

Corporate sustainability may be viewed as a process that occurs when a company adopts business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future (see Global Reporting Initiative, 2000, Labuschagne et al., 2005). This also entails the incorporation of the objectives of sustainable development, namely social equity, economic efficiency and environmental performance, into a company's operational practices (Labuschagne and Brent, 2006). An exploration of the relevant literature reveals that, broadly speaking, two threads of scholarship have contributed to sustainability concepts relevant to the business and environmental stewardship discourses. One comes from ecology and addresses ecological sustainability as a basis for natural resource conservation. The other comes from geography and United Nations development efforts and addresses the socio-economic sustainability of human well-being (Turner, 2003; World Commission on Environment and Development, 1987).

Following the lead of the Millennium Ecosystem Assessment, some scholars have begun to integrate these approaches to address socio-ecological sustainability, recognising that people are integral components of socio-ecological systems and that people both affect and respond to ecosystem change processes (MA, 2005; Berkes et al., 2003). Efforts that fail to address the synergies and trade-offs between ecological and societal well-being are unlikely to be successful. Local inhabitants, for example, are unlikely to respect rules that establish parks for species conservation but completely exclude local people and reduce their livelihood opportunities (Liu, et al., 2007). Conversely, development projects that stimulate unintended ecosystem

degradation (e.g. illegal logging owing to improved access) are unlikely to produce a sustainable trajectory of human well-being (Folke et al., 2004; MA, 2005).

Environmentalists increasingly frame their analysis of natural resource loss in terms of the benefits or ecosystem goods and services provided to people. For example, the Millennium Ecosystem Assessment emphatically states that if current trends continue, ecosystem services that are freely available today will cease to be available or become more costly in the near future (see MA, 2005). Once internalised by primary industries, additional costs that result will be passed downstream to secondary and tertiary industries and will transform the operating environment of all businesses. The McKinsey Global Institute (2011) states that greater pressure on resource systems together with environmental risks present a new set of leadership challenges for both private and public institutions. Loss of biodiversity and ecosystem services will affect the framework conditions within which businesses operate, influencing customer preferences, stockholder expectations, regulatory regimes, governmental policies, employee well-being, and the availability of finance and insurance. Higher operating costs or reduced operating flexibility should be expected due to diminished or degraded resources (such as fresh water) or increased regulation.

Ecosystem services substantially contribute to people's livelihoods in terms of direct increases in their revenue as well as the enhancement of non-income benefits from the ecosystem services received (Nunes et al., 2011). The continued supply of these products and services depends not only on sustainable use of traded species or utilised ecosystem services, but the careful management of the entire ecosystems upon which they depend (UNEP, 2010). The TEEB Report (2010) points out that our ecosystems, biodiversity, and natural resources underpin economies, societies and individual well-being. The values of its myriad benefits are, however, rarely taken fully into account through economic signals in markets, or in day-to-day decisions by business and citizens, nor are they reflected adequately in the accounts of society.

2.2.1 Biodiversity-related risks for business

A number of risks are identifiable that businesses must expect to face in the changing environment. Houdet (2008) states that beyond the financial and social risks they have traditionally had to cope with, businesses must now face a new one, "environmental" risk. Taking account of this kind of risk requires that businesses modify their perspective. While we now accept that decisions taken today will have an impact on future generations, it is not necessarily the case that those who take the risks today will suffer the consequences tomorrow. KPMG (2012) summarises the risks faced as: physical; competitive; regulatory; reputational; litigation; and social. *Physical risks* include the risk of damage to physical assets and supply chains from climate change-related weather events and exposure to long-term environmental trends, such as variations in water availability or rising sea levels. *Competitive risks* include the risk of exposure to cost increases or cost volatility of key input commodities such as energy, fuel, water and agricultural products as well as exposure to shifts in market dynamics.

Regulatory risks include the risk of increased costs and complexity for business from policies and regulations designed to limit the long-term effects of sustainability mega-forces. Examples include carbon taxes, emissions trading systems and fuel tariffs. *Reputational risks* include the risk of damage to corporate reputation and brand value among stakeholders when a company is perceived as failing to act appropriately in response to sustainability challenges. *Litigation risks* include the risk of litigation over environmental damage or insufficient corporate disclosure on sustainability. *Social risks* include the risk of serious disruption to business operations and supply chains due to the societal effects of sustainability mega-forces. Examples include mass migration as "climate refugees" try to escape the worst impacts of climate change; conflicts over scarce resources such as water; and civil unrest driven by population growth and wealth inequality (ibid).

The recognition that almost all businesses depend upon and negatively impact ecosystem services has also been fundamental in raising awareness with regards to the increasing risks that businesses face associated with natural resource scarcity. The Ellen MacArthur Foundation (2011) argues that throughout its evolution and diversification, our industrial economy has never moved beyond one fundamental characteristic established in the early days of industrialisation: a linear model of resource consumption that follows a '*take-make-dispose*' pattern in which companies extract materials, apply energy and labour to manufacture a product, and sell it to an end consumer — who then discards it when it no longer serves its purpose. While great strides have been made in improving resource efficiency, any system based on consumption rather than on the restorative use of resources entails significant losses all along the value-chain and eventually reaches a certain threshold beyond which further resource extraction becomes impossible (Schaltegger & Beständig, 2012).

This growing awareness has led some businesses to begin to measure and manage the associated risks and also try to scale-up mitigation, offsetting and sustainable use approaches. Associated with these risks, there are also opportunities to tap into new markets and business models (WBCSD, 2010). International commitments to sustainable development pathways and more responsible use of natural resources have also played a major role and drove the agenda for corporates to address biodiversity concerns. For example, at the 2012 Rio+20 Summit in Brazil, world leaders pointed out that environmental stresses have reached a scale at which planetary boundaries are being reached, increasing the probability of catastrophic environmental change. They further acknowledged that if the current '*business-as-usual*' model of societal and corporate resource-use practices continues, the costs and risks to the sustainability of the natural resource base and biodiversity are likely to be calamitous. For several years, the message that all key players must begin to take action has been articulated clearly and calls for action are now intensifying (Schaltegger & Beständig, 2012). Indeed, many companies throughout the world and in Africa have also begun to notice that the traditional linear system of resource use and consumption increases their exposure to risks, most notably higher resource prices and supply disruptions. As a result, business leaders are in search of an industrial model that decouples revenues from material input, a model that is restorative or regenerative by intention and design (Ellen MacArthur Foundation, 2011).

2.2.2 The shift towards greater environmental stewardship

Traditionally, environmental conservation has mainly been viewed by business as a risk or liability, rather than a potential profit-centre. Society generally ignores third-party effects of private exchanges (so-called 'externalities') unless they are actually declared illegal (Ibid). Houdet et al. (2009) states that biodiversity conservation is usually understood as an additional form of external environmental constraint on business activity within the context of the environment–competitiveness debate. However, this perception is beginning to change. As public awareness of the global biodiversity crisis grows, an increasing number of companies see a business advantage in developing processes to integrate biodiversity into their operations, as well as seeking market-based solutions and opportunities (Bishop et al., 2008; Schaltegger & Beständig, 2012).

Some scholars argue that the main positive contribution that business can make to environmental conservation is simply to provide cash, through taxes or charitable contributions, for conservation activities carried out by governments, NGOs or community organisations (see Friends of the Earth International, 2005). Others emphasise the need to reduce the environmental 'footprint' of existing businesses, through government regulations, binding voluntary agreements or under pressure from NGO advocacy campaigns. For example, the MA (2005) argues that business is positioned to be a very positive force in addressing these challenges through pursuit of new business opportunities and markets, reduction of operational

footprints, development and deployment of new technology, and establishment of effective partnerships. In addition, businesses can demonstrate leadership in support for and reform of public policy that seeks to raise industry environmental performance standards in order to gain first-mover advantages while improving the reputation of their industry as a whole with important customers and constituencies (Schaltegger & Beständig, 2012). A point cutting across most of the scholarship is that it is in business's self-interest to take a leadership role in reducing poverty, improving human well-being, and protecting our natural resources through voluntary stewardship.

The premise that informs this paper, however, is that our ecosystems would benefit from the development of complementary approaches that make conservation a profitable business activity in its own right. In the absence of profit, businesses would not be sufficiently incentivised to take environmental conservation seriously. As Jamison et al. (2005) points out, to demonstrate genuine environmental commitment companies must 'walk-the-talk', that is, build sustainability into their visions, annual goals, targets and plans, and have structures and processes to incorporate environmental considerations into all levels of business and decision making. Integrated environmental commitment and stewardship means that all actions, large or small, are evaluated for their environmental impact. Applying a whole-systems approach with credible, science-based and ecologically sound criteria should be part of an evaluation mechanism.

At the most basic level, stewardship means taking responsibility for the choices that we make and the quality of the environment by all those whose actions affect (see U.S. Environmental Protection Agency, 2005). This sense of responsibility is a value that can be reflected through the choices of individuals, companies, communities, and government organizations, and shaped by unique environmental, social, and economic interests. It is also constituted by positive behaviour that is demonstrated through continuous improvement of our environmental performance, and a commitment to efficient use of natural resources, protection of ecosystems, and, where applicable, ensuring a baseline of compliance with environmental legislative requirements. This also implies that the quest for corporate responsible leadership is no longer limited to scandals and subsequent calls for responsible and ethical conduct in the public domain (Brown & Trevino, 2006). Companies are expected to voluntarily make environmentally sound trade-offs. For example, if there is a choice between preserving a pristine high value wetland and establishing a mine, the expectation is that the wetland would be preserved.

In addition to the foregoing, stewardship now also stems from the changes in, and new demands from, business contexts (see Maak & Pless, 2006). One such expectation is that businesses and their leaders take active roles in fostering responsible behaviour, within and outside the organisation, such as by creating responsible organisational cultures imbedded in the 'triple-bottom-line' that takes into account the social, environmental, and economic value dimensions of the business and its resources (Maak, 2007; Waldman & Galvin, 2008). It is clear that most of the scholarship in this domain underlines the vital contribution of the environmental pillar to a company's bottom-line (profits) and the possibility of using the environment as an entry-point when addressing broader sustainability issues. Indeed, a fundamental paradigmatic shift is now recognizable globally regarding the way biodiversity should be managed by government, communities and the private sector. Being an environmental leader can put you ahead of the game and help differentiate your brand and attract new business. It seems that investors reward those companies with long-term visions rather than short-term gains, and robust environmental risk management practices (Chhabara, 2009).

There is also growing recognition that all actors and users have a pivotal role to play in the sustainable use and protection of natural resources and biodiversity (see UNEP, 2010; Schaltegger & Beständig, 2012). As Jamison et al. (2005) states,

corporations in Africa and beyond are beginning to respond to expectations of corporate responsibility by asking what is good for the environment, society and business, as well as how performance can be measured and evaluated. For some companies improving corporate environmental performance is simply "the right thing to do," while for others it is viewed as a strategic business advantage to increase competitiveness. These companies want to know what is expected of them so that they can incorporate environmental responsibility into their business strategies and become more competitive. More corporations are recognizing that there is value and opportunity in a broader sense of responsibility beyond the next quarter's results and that what is good for people and the planet can also be good for the long-term bottom-line and shareholder value (see KPMG, 2012).

Some scholars and practitioners now realize that environmental conservation does not necessarily mean excluding large tracts of land from development, or excluding biological resources from wise and sustainable use (the so-called fortress conservation approach). Although protected areas are important, by themselves, they are not sufficient to fully conserve ecosystems, nor do they normally provide for sustainable resource use. Equally important are efforts to sustain the working landscapes and waters between the protected areas in order to sustain human well-being and business activity in the long-term (Canadian Business and Biodiversity Council, 2010). A win-win approach has attempted to demonstrate the advantages of environmental actions undertaken by firms, invalidating the orthodoxy of negative causality between competitiveness and the internalization of environmental concerns (Porter & Van der Linde, 1995; Houdet et al., 2009). An exclusive focus on reducing the impacts of business on natural ecosystems through legislative enforcement and punishment should be discarded in favour of an innovative approach in which natural capital becomes an integral part of business strategy (Houdet, 2008). While some companies have already made significant steps to adopt and implement these approaches within the context of aspirations for a green economy, the big challenge remains the transformation of mainstream businesses to practically apply these approaches in a local and sector-specific context (Schaltegger & Beständig, 2012).

3. Case studies

In Africa, there are a number of forces that have contributed to the corporate environmental stewardship agenda. Apart from the socio-economic status of countries on the continent, business is also obliged to subscribe to an assortment of standards and guidelines for mandatory or voluntary sustainability. These include standards such as those emanating from the King Code Reports on Corporate Governance and the Global Reporting Initiative that are applied in South Africa, specifically requiring companies to provide annual integrated reports that cover the social, financial and environmental pillars. Paradoxically, however, in some countries there are companies that still operate 'wild-west' style, with no regard to legislation requiring environmental compliance. Nevertheless, there are several examples of promising corporate environmental stewardship practices that may require out-scaling to strengthen the agenda for business leadership and responsibility. For example, biodiversity offset legislation and schemes in South Africa, Namibia, Ghana, Guinea and Madagascar are interesting cases in point. Scholars such as Thwaits and Bouwer (2013) and WBCSD (2012) have also documented and showcased a number of case studies in which the corporate sector in Africa and elsewhere has demonstrated leadership in the domain of environmental stewardship.

3.1 Anglo American South Africa

Mining is an industry which, by its very nature, often makes for brutal and relentless demands on the environment. For this reason, Anglo American South Africa places sustainability at the centre of its operations. According to Thwaits and Bouwer (2013), the group established a sustainability department in 2009 to enhance its performance in this area by integrating the

group's sustainability agenda into its key business processes. For example, they take into account sustainability considerations such as the business and social impacts of water availability when investment decisions are made. Thus, the company factors access to water and land into the way new projects are evaluated. Water-use efficiency targets have been set and operationalized through recycling and re-using the water they access. A water treatment plant has been built in Witbank in the middle of one of their operations to process water for use in the mine and also supply the municipality. Globally, Anglo American's investment in 60 water-saving projects enabled them to achieve a saving of 6.8% against projected water-use.

3.2 BMW South Africa

In 2006, BMW South Africa's plant in Rosslyn, Pretoria, was the first to win the Enviro Award at the 21st Logistics Achiever Awards for its energy reduction and sustainability measures. Through concerted efforts and innovation, the company has since realised several gains in conserving natural capital, including a water consumption reduction of 80%. In its production operations, it uses materials that are compatible with the environment such as recyclables and natural materials; avoids use of environmentally harmful materials; has committed itself to use of clean energy and development of electric cars, hybrid vehicles, and hydrogen-powered vehicles using natural gas. The company has already invested about R2.2 billion at the Rosslyn Plant to make all these innovations possible. 70 solar water heating panels installed at the Plant help in saving energy. Scientific calculations indicate that about 2 million litres of water are saved each month through desalination, treatment and sterilisation of waste liquid. Globally, for seven years in a row, BMW has been named the world's most sustainable automaker by the Dow Jones Sustainability Index. So far, BMW is the only automobile company to have been listed in the top three every year since 1999 when the index was founded. Through use of the dynamic efficiency technology, the company has been able to significantly reduce carbon emissions from its cars.

3.3 ArcelorMitta in Liberia

ArcelorMittal is the world's leading steel and mining company, with a presence in more than 60 countries and a workforce of some 260,000 employees. The Group has a world class mining business, with a global portfolio of over 20 mines in operation and under development, and is the world's 4th largest iron-ore producer. With operations in over 22 countries, spanning four continents, ArcelorMittal has committed itself to operating in a responsible way with respect to the health, safety and well-being of its employees, contractors and the communities in which it operates.

ArcelorMittal has implemented a biodiversity compensation program at its iron-ore mining operations in Liberia's remote Nimba mountain range, which is generally considered to be in the top five biodiversity hotspots of Africa. The company set out to achieve two main objectives, namely, compensation for the permanent alterations to the environment caused by mining and focusing on biodiversity as the environmental issue under greatest threat, and to use this as the catalyst to slow its decline. The first step was to build a solid basis for informed decision-making, which meant carrying out a large-scale ecological study over several years to determine scientifically the current state of biodiversity in the region. The study was led by a large team of specialists from a number of universities, research institutes and development partners in Liberia and other neighbouring countries. The ecological studies confirmed high levels of biodiversity in the forests close to the mine sites. ArcelorMittal has had the opportunity not only to mitigate damage from mining, but also to start reversing a trend of long-term degradation and decline caused by a history of logging, agriculture and previous mining operations. Since 2011, the company has been working to mitigate its impacts on ecosystems affected by mining at every stage of the development project, leveraging the multi-stakeholder consultation that it is leading.

In consultation with local stakeholders, ArcelorMittal has designed its biodiversity offset program to compensate for the land lost to mining. The main result has been a commitment by ArcelorMittal to an annual budget of at least half a million dollars per year, during its four-year mining start-up phase, to be dedicated entirely to the biodiversity conservation program. The aim of this program is to develop activities that enable the communities using the forests to derive benefits from conservation, rather than from the traditional and sometimes more destructive use of forests. Support is also being given to awareness-raising on forest values among the communities, and to establishing effective forest management practices for community forest-user groups. ArcelorMittal has long-term mining plans for the area. For this reason, the company has taken its responsibility seriously and identified a significant opportunity to have long-term impact, as well as to make a demonstrable contribution to the sustainable development of Nimba. Although it is too early to assess its success, ArcelorMittal's biodiversity conservation program is already a well-established part of Nimba forest conservation activities.

3.4 AngloGold

Water is a critical input for the mining industry. It is also fundamental to socio-economic development and the maintenance of sound ecosystems. In the mining industry, water is used, among other things, in power generation, dust suppression, mining and processing, cooling, rehabilitation and for human consumption. AngloGold South Africa developed a global strategy for building water security in 2011, and is being progressively implemented. This strategy focuses on reducing raw water consumption, continuous improvement in integrated water management practice, progressively addressing discharge water quality legacy issues and enhanced transparency in monitoring and reporting. Major focus for the corporation is on minimising fresh water intake from the environment, combined with securing water supplies for the future, as well as ensuring that the quality of water discharged
by our operations at least meets regulatory requirements.

AngloGold's South African operations include a complex network of shafts, underground workings, metallurgical plants, tailings storage facilities (TSFs) and surface infrastructure. This infrastructure traverses significant distances (horizontally
and vertically), in an area that has been intensively mined by numerous mining companies for many decades. Many of these mines are no longer operating. Most of the mines are situated within or adjacent to local municipalities, farmland, industrial complexes and informal settlements. Water management is therefore a complex issue, and sources of contamination cannot always be easily isolated. The implementation of AngloGold's revised integrated water management strategy in South Africa is aimed at reducing water consumption; optimising the efficiency of their water circuits; minimising the potential for discharge of contaminated water into the environment, either directly or indirectly, as a result of seepage from the mines; and preventing the contamination of land beyond current mining boundaries as a result of planned or unplanned discharges.

Before the intervention, AngloGold's South Africa operations accounted for approximately 40% of the group's total water consumption. The integrated water management strategy also addresses issues such as potential mine flooding; groundwater and storm water management; and the potential impact of mining activities on the water supply to neighbouring areas. Mitigation measures include the development of regional mine flooding models, and plans and technical remediation options for seepage. Avoiding, or, where this is not possible, mitigating the group's impacts on the water environment remain significant priorities. Where feasible they operate a closed loop system, recycling the water used in their operations without discharging to the environment. This reduces the potential environmental impact, enabling the company to reduce both water consumption and the potential for water contamination. At some operations – for example in Ghana – high levels of rainfall mean that a

closed system is not feasible and that controlled releases must take place. In this situation, they ensure that they have the water treatment systems in place to manage effluents to meet applicable discharge standards.

A closely related commitment is planning for mine-closure, which is guided and overseen by a company closure working group. The management of cyanide and waste generated during the gold production process remains an important consideration for AngloGold Ashanti. Compliance with the International Cyanide Management Code (Cyanide certification Code), along with rigorous reporting, is central to this. For example, at the end of 2012, 16 of AngloGold's plants in different African countries had achieved and/or retained Cyanide Code certification. Cyanide destruction technology has also been installed at some of the mines.

3.5 Discovering the Ecosystem Value of Ecological Networks in Developed Landscapes in South Africa

Mondi is an international paper and packaging group with operations across 28 countries. The Group's key operations are located in central Europe, Russia and South Africa. Mondi is fully integrated across the paper and packaging process, from the growing of wood and the manufacture of pulp and paper (including recycled paper), to the conversion of packaging papers into corrugated packaging, industrial bags and coatings. Mondi's ecological networks are composed of remnant natural land set aside for the mitigation of any negative effects of intensive land use. These networks consist of large-scale, interconnecting corridors and nodes that play an important role in conserving ecological connectivity across the landscape. The networks also create refugia in which organisms can survive. They help to reduce the isolation of populations or even individuals, thus allowing for gene flow, reducing the loss of genetic variation that occurs when a new population is established by a very small number of individuals. Ecological networks also facilitate the re-colonization of areas after localized species extinctions. This reduction of isolation and fragmentation helps to prevent ecological degradation in the long-term, thereby mitigating further biodiversity loss in a production landscape.

Securing access to sustainable fibre is fundamental to Mondi's business and the responsible management of 307,000 hectares of FSC certified land in South Africa, of which 203,000 hectares are commercial forestry plantations, is a company priority. Most of the non-commercial land is comprised of remnants of natural ecosystems such as wetlands, riparian habitats, grasslands and indigenous forests that have been set aside. The importance of these remnants to sustaining biodiversity, and for commercial production within the production landscape, is paramount. For example, these networks can help to ensure ecological function and reduce the effects of habitat fragmentation. They can also provide opportunities to address the underlying causes of biodiversity loss by putting people working in the production landscape in contact with biodiversity. Mondi has been engaged in supporting scientific research into the effective design and management of ecological networks, which is making a significant contribution to land and freshwater stewardship. Mondi's cooperation with researchers at Stellenbosch University on the topic of biodiversity issues in ecological networks spans almost two decades of studies and field experiments on Mondi's land. More recently, three years of intensive research by a team of scientists based at the university has revealed ways in which these networks help to meet a range of the Aichi Targets for biodiversity conservation.

After four years of extensive research in to the value, functioning, design and management of Mondi's ecological networks and the adjacent protected or high conservation areas, the *Mondi Ecological Network Programme* team at Stellenbosch University has developed a multi-taxon database with 29,000 records. This research has been on plants, large mammals, birds and the hyper-sensitive and resource-dependant arthropods. Their conclusions are that ecological networks are effective at conserving biodiversity and ecosystem function, provided they are well designed and managed, to provide good quality habitat. Measuring

ecological networks against their ability to contribute to or meet Aichi Targets is proving to be a very useful way of illustrating the real values of ecological networks in a production landscape.

3.6 Achieving the Goal of Net Positive Impact on Biodiversity – Rio Tinto

Rio Tinto is a world leader in finding, mining and processing the Earth's mineral resources. Its interests are diverse both in geography and product, working in some of the world's most difficult terrains and climates. Most of Rio Tinto's assets are in Australia and North America, but it also operates in Europe, South America, Asia and Africa. Its businesses include open pit and underground mines, mills, refineries and smelters, as well as a number of research and service facilities. For Rio Tinto, achieving a net positive impact (NPI) means ensuring that its presence in a region ultimately has positive effects on biodiversity, outweighing the inevitable disturbances and impacts associated with mining and mineral processing. Rio Tinto's biodiversity target is to achieve an NPI on biodiversity by the time it closes its operations, with a goal to have an NPI as early as possible during the life of the operation.

Impacts on biodiversity make mining and processing projects sensitive for governments, local communities, investors, non-governmental organizations and employees. Recent development and exploration experiences within the Group have demonstrated that biodiversity conservation issues can present material risk for Rio Tinto. The group's growing focus on exploration in developing countries means that there is large potential for land-use conflict to become an increasingly significant issue for Rio Tinto. The mining giant has adopted a biodiversity strategy and NPI goal to address a number of key business risks, including managing the growing issue of land-use conflict and access to resources, as well as meeting its site closure obligations. The strategy and NPI goal provide Rio Tinto with both a performance target – achieving regional conservation gains – as well as a number of tools, required to help balance the potentially conflicting actions of resource extraction and biodiversity conservation.

The Biodiversity Strategy was adopted in 2004 to manage the threats and opportunities presented by biodiversity and ecosystem service issues. To support the strategy, a series of methodologies and tools has been developed with the input of biodiversity stakeholders, such as Flora and Fauna International, Birdlife International, IUCN, The Biodiversity Consultancy and Hardner & Gullison – to help Rio Tinto operations identify, plan for and manage biodiversity programs based on the needs of that business, as well as the biodiversity values of the regions in which they operate. The use of offsets to compensate for biodiversity loss is now practiced widely and is required by legislation in a number of countries where Rio Tinto operates. Biodiversity offset programs are helping Rio Tinto achieve the goal of net positive impact, while meeting legal requirements and maximizing conservation gains in Madagascar, Guinea, Ghana, Australia and Mongolia. The development and implementation of Rio Tinto's biodiversity strategy and NPI commitment has been responsible for the company's number 1 ranking on a number of global performance indicators, including the United Nations Environment Programme Finance Initiative's Natural Capital Initiative global benchmarking project. In addition, Rio Tinto is well-positioned with regard to emerging legislative and policy lender performance standards for biodiversity management and offsetting.

4. Strange bed-fellows?

The need to change the way we do business is no longer in question. From the case studies presented in this paper and broader natural resource conservation discourses that have gained currency in more recent years, it is becoming increasingly apparent that corporate sustainability and environmental stewardship are not necessarily the strange bedfellows that they have been traditionally been viewed as. They are two systems that can co-exist in harmony if the right conditions are provided.

Indeed, the corporate sector can reposition itself to be a very positive force in addressing the challenges faced through pursuit of new and 'smarter' ways of dealing with ecosystem degradation, pursuing new business opportunities arising from the agenda for a green economy, deliberately seeking to reduce its environmental footprint, developing and deploying new eco-efficient technologies and establishing effective partnerships.

It is also clear that collective responsibility, leadership and action will be required to address the complex challenges that businesses face as they interact with or make use of natural capital. Within this context, they must also anticipate that new policies and regulatory frameworks will be developed and deployed by the governments in response to a declining natural resource base. Therefore, the corporate sector can demonstrate leadership in support for reform of public policy to raise corporate environmental performance standards and gain first-mover advantages while improving the reputation of their industry as a whole with important customers and constituencies. While the risks associated with the decline of natural resources and important ecosystems are great, taking decisive action now rather than later will help secure stable and safe societies in Africa and beyond, ensure continuing access to critical resources, provide new products and business opportunities, avoid abrupt social and environmental change, and probably realise some competitive advantages for the businesses that take first-mover leadership advantages in this landscape.

5. Challenges

A number of challenges are evident in the corporate sustainability and environmental stewardship landscape. Options and solutions for dealing with these challenges are neither straight forward nor easy to implement.

5.1 Business-as-usual

A very immediate and enduring challenge relates to the naivety associated with underestimating the resilience and extent of '*business-as-usual*'. Vehemently defended and maintained by significant sections of society that prefer to believe that '*the business of business is business*', business-as-usual resists calls for the corporate sector to engage actively and directly address the ecosystem degradation challenge. This group sees the need for fundamentally changing our business models as overstated, unnecessary and even non-beneficial. In essence, the traditional dilemma of '*profit-motive-versus-costs'* in corporate environmental conservation efforts continues to rear its ugly head even when businesses have committed themselves to address the challenge.

MacDonald (2010) argues that since the rise of organisational environmentalism in the 1960s, business and biodiversity conservation organisations have lived in two distinct and heavily bounded worlds. The dominant view was that they embraced values, approaches and missions that were deeply incompatible. TEEB (2010) states that despite the promising potential for high returns, ecological infrastructure projects require significant up-front investment. The costs vary widely, not only between ecosystem types but also according to the level of degradation, the level of ambition and the specific circumstances in which restoration may be carried out. Costs of restoring ecosystems may range from hundreds to thousands of dollars per hectare in grasslands, rangelands and forests, to several tens of thousands in inland waters, and even up to millions of dollars per hectare for coral reefs. A related constraint is that the expected benefits, even when they are marketable (such as in the case of freshwater provision or waste treatment) can take time to materialise. Together with the high initial costs, this can put off private investment (ibid).

5.2 Irreversible environmental damage

Evidence emerging from a range of sources suggests that, due to the extent of the damage already inflicted on ecosystems, current efforts to conserve natural capital are merely slowing rather than reversing the erosion of biodiversity (Bishop et al., 2008). The implication is that even if serious efforts are undertaken to address the major challenge, business and society will continue to face risks posed by the environmental degradation of the past decades. Long-term prospects for conservation also remain very uncertain, due to all the uncertainties surrounding the climate change phenomenon. Growing awareness of climate change, in particular, has led to increasing concern about its adverse impacts on ecosystems, but also of the potentially significant role that biological resources can play in mitigating and adapting to climate change (Kapos et al., 2007). The uncertainties make planning for stewardship more difficult.

5.3 Technical guidelines and tools

Even as companies perceive the growing business case for integrating environmental stewardship and ecosystem services issues into corporate governance, strategy and operations, the challenge is how to practically take action. The set of corporate experiences and applications to-date highlights many unanswered questions. For instance, there are not yet many widely agreed-upon coherent guidelines on specific indicators to track biodiversity degradation and conservation, measure, and assess findings, ideally in a way that links directly to existing corporate environmental assessment processes and protocols. Haywood et al. (2010) argues that most of the techniques and tools currently in use focus more on the impact of carbon emissions, measured in terms of resource consumption and waste emissions, while ignoring the consequences and contribution to the ecosystem. In addition, companies lack direction on how to prioritise some ecosystem services over others, particularly in cases where key stakeholders disagree about priorities (BSR Ecosystem Services Working Group, 2012). Most documents published in recent years have provided conceptual approaches, but specific operational guidance is still very much in development as the field continues to grow and mature. Managers face the overall challenges of selecting the most appropriate tools and integrating their application into business processes in the absence of well-tried-and-tested methods (see Bishop et al., 2008).

It is also important to note that different industries face different challenges in mainstreaming environmental stewardship into corporate sustainability and this makes it difficult to develop generic frameworks and tools applicable across most businesses (UNEP, 2010). Indeed, the lack of technical and scientific tools that key actors can pick up and apply to enhance conservation initiatives remains a major challenge. In addition, well-linked end-to-end processes that can be applied through a corporate system do not currently exist. Therefore, corporate managers who seek conservation tools will likely need to adapt existing tools so that they are appropriate for specific contexts and available data-sets. Unfortunately, many of the current tools have been built as more general decision-making aids (BSR Ecosystem Services Working Group, 2012). As the Canadian Business and Biodiversity Council (2010) points out, biological processes are difficult to understand and to measure, which makes it a challenge for companies to actually track how natural capital is changing. In the absence of applicable tools, the challenge grows.

6. Conclusion

This paper has highlighted the challenges and opportunities evident in the nexus between corporate sustainability and environmental stewardship. It is clear from the analysis that the involvement of business in environmental conservation should not be considered as a ‘magic-bullet’ as the challenges evident in that landscape remain difficult to resolve even though it could be considered as an important precondition for progress. There is now sufficient evidence from various parts of Africa and the rest of the world indicating that businesses that degrade ecosystems can reposition themselves to become more responsible leaders and environmental stewards in ways that minimize their environmental footprint. The challenges evident in this

landscape outlined in the paper demonstrate that the road ahead is not smooth and full transition to more environmentally conscious and responsible corporations will be difficult. Perhaps a gradual experiential approach will be more effective – firstly, to provide the time necessary for the 'learning-by-doing process' to take root and secondly, to enable policy-makers and governments to implement appropriate action in the face of resistance from those who benefit from the current business-as-usual scenario.

Clear communication and messages that reveal the links between natural resources and economic production, social well-being and sustainability will be essential, especially when adapted to specific target audiences. The first stage in the battle, achievable through national and international policy-efforts, is to change business operational mentalities and attitudes, inculcate a corporate culture that recognises the value of natural capital, and catalyse a move away from a short-term focus on profits. The approach and analysis adopted in this paper suggests that a proactive organisation will put in place the appropriate 'hard' and 'soft' infrastructure for research, innovation and investment needed to tackle some of the challenges identified. Although the evolution to a sustainable world will require commitment and support from all sections of society, corporations seem to be at the centre of the sustainability conversation, and this gives them unique leverage to drive positive change through stewardship. In a world where profitability is no longer the sole driving force for innovation, society will increasingly expect companies to serve as active stewards of the environment and support the social fabric that has served them so well and sustained their operations for so long. Many investors and shareholders who are environmentally conscious are likely to re-align their financial capital with companies that meet these expectations.

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