

**THE ROLE OF SUSTAINABLE DEVELOPMENT IN RISK ASSESSMENT AND
MANAGEMENT FOR MULTINATIONAL CORPORATIONS**

***The Role of Sustainable Development in Risk Assessment and Management for
Multinational Corporations***

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The nature and causes of international business risk fall into two categories—macro-causes, such as competing political systems, conflict, and social unrest; and micro-causes, such as changing market conditions and unstable economies. The mining and minerals sector faces especially high risk in both categories due to increasing exploration and production in developing countries. This paper presents a conceptual model for risk assessment and management integrating traditional financial valuation models and the principles of sustainable development, utilizing corporate social responsibility as the strategic focus for decisions to reduce risk exposure. Examples of the model’s application are provided from Newmont Mining’s worldwide operations.

Today, there are more than 69,000 transnational corporations with over 690,000 affiliates. The top 100 alone produced more than \$5.5 trillion in sales, maintained \$8 trillion in assets, and employed approximately 14.6 million people. They account for one third of all world exports and a tenth of gross world product (U.N. Conference on Trade and Development, 2005). The business sector meets the needs of people worldwide by providing goods and services and contributing to a complex social system that has extended life spans, accelerated innovation, and increased both the quality of life and standard of living for millions of people world wide. These contributions, however, have come with significant costs as some of the processes used by business, government, and society to achieve growth and development have also had negative consequences for some members of our global society and the environment, putting at risk the ability to continue such growth in a sustainable manner. DuPont Chairman and CEO, Charles

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Holliday, Jr. says, “business will not succeed in the twenty-first century if societies fail or if global ecosystems continue to deteriorate” (Whiting and Bennett, 2001).

The United Nations Millennium Development Goals capture the concerns of Holliday. In September 2000, the world’s leaders gathered at the UN Millennium Summit, and 189 nations adopted the Millennium Declaration committing to specific targets and deadlines for overcoming the poverty that continues to grip most of the world, recognizing the critical role of a healthy environment and the necessity of partnerships between business, governments, and society in achieving the goals. Table 1 lists the eight goals and targets along with selected examples of the social and environmental challenges from the 2003 Human Development Report (Fukuda-Parr, 2003).

TABLE 1
United National Millennium Development Goals*

Goals	Targets	Challenges
1. Eradicate extreme poverty and hunger.	Halve the proportion of people living on less than a dollar a day by 2015.	1.2 billion people survive on less than \$1/day; 800 million undernourished; half the population of sub-Saharan Africa live in poverty.
2. Achieve universal primary education.	Ensure that all boys and girls complete primary school by 2015.	One in five children do not have access to the most basic education.
3. Promote gender equality and empower women.	Eliminate gender disparities in primary and secondary education by 2015.	63 million primary age girls are not enrolled in any school.
4. Reduce child mortality.	Reduce by two-thirds by 2015 the under five mortality rate.	Almost 11 million children, more than 1,200 every hour, under age 5 die every year from mostly preventable causes.
5. Improve maternal health.	By 2015, reduce by three quarters the maternal mortality rate.	Globally one woman every minute dies in pregnancy or childbirth each year. In developed countries the risk is 1:2800. In Africa it is 1:16.

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6. Combat HIV/AIDS, malaria, and other diseases.	Halt and begin to reverse the spread of HIV/AIDS and the incidence of malaria and other major diseases.	HIV/AIDS is the leading cause of death in sub-Saharan Africa and fourth worldwide.
7. Ensure environmental sustainability.	Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources/.	2.4 billion people do not have access to improved sanitation; 1.2 billion do not have access to safe water.
8. Develop global partnership for development.	Rich countries provide access to markets and technology; developing countries focus social needs, human capital, and good governance.	Percentage of donor country gross national income devoted to aid is about 0.26%; OECD agricultural support is roughly six times that devoted to development aid.

*Adapted from “Why Do the Millennium Development Goals Matter,” Secretary-General’s 2003 Report on Implementation of the UN Millennium Declaration, UN Development Program, September 2003.

The size and power of the business sector, the perception of Holliday (shared by many business leaders), the Millennium Declaration, and the state of global society and the environment that prompted them, suggest that business must take a leadership role in creating a more sustainable society. If not, both the quality of life on Earth and the corporations’ bottom lines will suffer. The role of corporate responsibility in finding solutions to social problems is no longer in question. The pertinent question is how. Peter Drucker agrees that business does have a responsibility to help find solutions to societal problems, but in ways that fit their competence, and in which the social issue can become an opportunity for the organization.

One of the most pressing areas for companies in today’s global business environment is the assessment and management of risk. Managing risk is cited as one of the primary objectives of firms operating internationally (Ghoshal, 1987). Levinsohn (2002) notes that the science of risk management has made remarkable advances in the past twenty years on the financial side, developing new tools for offsetting risk exposures to foreign exchange, interest rates, and liquidity for example. However, few companies seem prepared to deal with the emerging issues in political risk that today’s new geopolitics presents. In today’s world of rapid change, growing

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uncertainties, instant communications, and unstable political environments traditional portfolio planning models and financial risk assessment methods are likely incomplete and even unrealistic (Kennedy, 1998). Miller (1992) suggests that risk assessment and management too often focus on a particular set of uncertainties to the exclusion of other interrelated uncertainties. He concludes that both financial and strategic corporate risk management must be considered together and treated as interdependent.

Further complicating effective risk assessment and risk management strategies is that a portfolio/political risk analysis has a dynamic, country specific focus. And, vulnerability to adverse political events varies by industry type, size of project, and management actions. Generally, those most at risk are natural resource companies; large, visible, and politically sensitive projects; and management actions that ignore local cultures and values and do not “fit in” with the community.

This paper presents a conceptual model for risk assessment and management that utilizes the principles of sustainable development while being true to the overarching finance/economic goal of maximizing firm value within the context and constraints of an increasingly complex and uncertain global environment. First, sustainable development and corporate responsibility will be discussed in the context of the mining and minerals sector. Second, a model will be presented to strategically address the issues of risk assessment and management. Third, examples of managing risk through sustainable development will be provided from the mining and minerals sector, using the experiences of Newmont Mining, one of the world’s largest gold mining companies. Finally, a set of conclusions and recommendations will be offered.

SUSTAINABLE DEVELOPMENT AND THE MINING AND MINERALS SECTOR

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In 1987, the World Commission on Environment and Development issued a report that served as the catalyst for the sustainability movement. *Our Common Future* (World Commission on Environment and Development, 1987) laid out a “global agenda for change” recognizing the need for cooperation, coordinated political action, and the engagement of the private sector as a leader and major driver of change and innovative solutions for a broad array of environmental, social, economic, and security challenges. Because of stagnant economies, rising debt, and a mismanaged environment, the 1980s was referred to as the “lost decade” in Latin America (Holliday, Schmidheiny, & Watts, 2002). At about the same time, evidence was mounting that many corporations were experiencing high levels of growth and profitability through a variety of illegal and unethical practices. The subsequent market collapse at the end of the 1980s, referred to none too fondly in the press as the “decade of greed,” was a precursor to the market collapse at the turn of the century when society was witness to a \$10 trillion worldwide loss of aggregate market value brought on by the now infamous cases of Enron, WorldCom, Adelphia and many others (Gordon, 2002). Today, companies continue to struggle to regain lost trust of customers, employees, shareholders, governments, and communities. As a response, many enlightened companies have begun to adopt corporate responsibility strategies aimed at aligning the self-interest of the corporation with the greater public good in ways that add to the value of the firm and society.

The Business Case for Sustainable Development

In 1983, the General Assembly of the United Nations created the World Commission on Environment and Development with the charge to formulate a “global agenda for change.” The early focus was on environmental concerns. However, it was quickly recognized by the Commission that the environment does not exist independently from human actions, needs, and

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ambitions. What was needed was a definition of sustainable development that embraced an integrated, interdisciplinary approach to global concerns and recognized the interdependency of economic development, environmental concerns, and social justice. In the past, concerns had focused on the impacts of economic growth on the environment. The equally important issue is the impact of ecological stresses on the ability to maintain and grow economically. Per Lindblom (1985) said “The problems of today do not come with a tag marked energy or economy or CO₂ or demography, nor with a label indicating a country or a region. The problems are multi-disciplinary and transnational or global. The problems are not primarily scientific and technological. In science we have the knowledge and in technology the tools. The problems are basically political, economic, and cultural.”

Coming out of the report was the definition of sustainable development people are most familiar with: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (*Our Common Future*, 1987). The definition suggests that sustainable development is not a fixed state of harmony but a continual process to accommodate changing current and future needs. Responsibility is to the present and future, just as a company’s obligation is to provide both short term and long term value to shareholders. The process of engaging in short term behaviors at some sacrifice now in order to ensure a healthy environment for the future is consistent with the struggle managers have in balancing short term quarterly earnings pressures against creating long term value of the firm. Such processes are not easy or straightforward, and often painful, particularly in the short run. Consequently, whether one is talking about the sustainability of the planet or of a company, ultimate success rests on political will.

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Over the years, the business case for sustainable development has continued to grow, although not as fast as many hoped. Business leaders have begun to see the connection between sustaining the planet and sustaining the business enterprise. Both require balancing acts between long and short term and among influential stakeholders. Too much either way means disaster. The futures perspective resonates because companies that live only in the present are less likely to innovate or notice disruptive technologies coming their way. However, banking on future needs (e.g., dot.coms) can be equally disastrous. With the rapid pace of technology advances, uncertain and changing political landscapes, globalization, and instantaneous communications, business leaders are recognizing that strategies as usual carry more risk and less reward than at any time over the past thirty years (Holliday, et al., 2002). Sustainable development is one way to think about new ways to grow and prosper.

At the end of the day, however, the ability to sustain sustainable development as a viable integrated process lies with the ability to show it adds value to the company. The literature in this area is growing, but the story is not complete. A growing number of studies show a positive link between the profitability of a company and its implementation of environmental and social goals. A direct casual link is hard because of the number of variables and determining direction of causality. One of the most comprehensive studies of this issue was done by the London based organization, SustainAbility (2001) in conjunction with the United Nations Environment Program. The study cross-linked ten measures of business success (shareholder value, revenue, operational efficiency, access to capital, customer attraction, brand value/reputation, human and intellectual capital, risk profile, innovation, license to operate) with ten dimensions of sustainable development (ethics/values/principles, accountability/transparency, triple bottom line, environmental process focus, environmental product focus, socio-economic development, human

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rights, workplace conditions, engaging business partners, engaging non-business partners). It concludes that corporate sustainable development performance does have a positive impact on business success. Brand value and reputation appears to be most positively linked to sustainability performance and environmental process is supported by the strongest business case. And, there is a positive link between sustainable development performance and verified financial results.

Strategic Value of Corporate Responsibility

The question remains as to how to build sustainable development processes into the overall strategy of the firm in order to create value. Strategic corporate responsibility represents a way for the firm to engage the process of sustainable development in a way that aligns the self interest of the firm with the greater public good. The concept of corporate responsibility has evolved over the past twenty years under a variety of names—philanthropy, enlightened self-interest, social responsiveness, corporate social responsibility, strategic investment, corporate citizenship. While the concept still lacks a universal definition, one of the most useful is achieving commercial success in ways that honor ethical values and respect people, communities, and the natural environment. As a way to integrate sustainable development processes and practices within the overall strategy of the firm, this definition provides some useful guidelines. It implies four dimensions from which business strategy should be built. The foundation of a responsible company is to be **profitable**, but not at any cost. Society also demands the company **obey the law**, expects it to act in an **ethical** manner toward all stakeholders and to be a good **corporate citizen** in the communities in which it lives and operates.

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As with sustainable development, the growth of strategic corporate responsibility is most directly linked to its impact on financial performance. The evidence of the linkage continues to grow, although results are not conclusive, primarily because of issues of measurement and lack of developed theory (McWilliams & Siegel, 2000; Fogler & Nutt, 2001; Vance, 2001).

In a study comparing higher to lower yielding companies across ten industries from 1977 to 1988, the more financially successful companies valued stakeholders' interests, fairness, and leadership more than the lower yielding companies (Kotter & Heskett, 1992). A 1985 study of 81 high growth companies found that leading companies tended to have a well articulated set of guiding principles, a strong sense of shared values, and whose leaders were more motivated to make a difference (Clifford and Cavanaugh, 1985). Paine (2003) suggests that maybe the best perspective on the issue of values and economic performance is contained in a review of 95 academic studies examining the relationship between economic and social performance (Margolis and Walsh, 2001). Although noting a variety of methodological issues, 55 of the studies found a positive correlation between financial and social performance. Only five found a negative relationship.

A study by Gompers, Ishii, & Metrick (2003) found that firms with a high 'governance index' representing stronger shareholder rights had higher firm value, profits, sales growth, and lower capital expenditures. GovernanceMetrics tracked returns on firms listed on the S&P 500 index, and found that firms scoring high on corporate responsibility metrics outperformed the overall index on average stock price increase, return on assets, return on investment, and return on capital. Comparably, the United Kingdom's Institute of Business Ethics compared companies in the FTSE 250 on the strength of their ethics codes based on risk ratings and performance

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rankings on a ‘most admired company’ index. They found that those companies scoring highest had higher EVM and MVM, as well as higher profit as a percentage of income.

This growing relationship between corporate responsibility actions and financial performance seems to be occurring for a number of reasons. Consistent with sustainable development, efficiency is an important starting factor. Reducing waste and production inefficiencies reduces environmental impacts and costs. A number of other studies have shown a strong relationship between responsible companies and a higher quality, more productive and innovative workforce (Paine, 2003; Amabile, 1998; Kim & Mauborgne, 1993; Moorman, 1991). Responsible companies can also benefit in the marketplace, enjoying improved reputation for their social and environmental actions, possibly leading to access to new markets. Responsible actions can also reduce risk—being subjected to new regulations, being pressured to change policies by special interest stakeholders, and being affected by higher business costs due to externalities such as forces of nature or civil conflict.

Mining, Minerals, and Sustainable Development

Earlier it was mentioned that portfolio/political risk is subject to country specific factors, and that vulnerability varies by industry type, size of project, and management actions. Not surprisingly, one of the most at risk is the natural resource industry—large, visible, engaging in politically sensitive projects, and with a history that too often ignored local cultures and values. The mining and minerals sector faces some of the harshest criticisms of any sector and has generally struggled to gain the trust of the critical stakeholders it has to deal with. The industry has come to understand that its long-term interests will be served only if mining contributes—

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and is seen to contribute—to sustained economic development in the regions and communities where the companies operate.

This understanding has led to an emphasis within Newmont and much of the mining industry generally, on the concepts of sustainable development, environmental stewardship and social responsibility. For example, Newmont is a founding member of the International Council on Mining and Metals (ICMM)—a group comprised of 14 of the world’s leading natural resources companies and committed to raising the bar of industry performance through a four-pronged framework. Each member is committed to adhering to 10 sustainable development principles (see below); publicly reporting on its performance in accordance with the Global Reporting initiative; providing third party assurance of its performance and reporting; and sharing and developing best practice guidance within the industry. ICMM and its members, including Newmont, are working with a number of organizations, including the United Nations, the World Bank, and the World Conservation Union, on joint initiatives regarding community engagement, biodiversity, emergency preparedness, indigenous rights, mine safety, and a host of other topics.

ICMM Sustainability Principles

1. Implement and maintain ethical business practices and sound systems of corporate governance
2. Integrate sustainable development considerations within the corporate decision-making process.
3. Uphold fundamental human rights and respect cultures, customs and values in dealings with employees and others who are affected by our activities.
4. Implement risk management strategies based on valid data and sound science.
5. Seek continual improvement of our health and safety performance.

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6. Seek continual improvement in our environmental performance.
7. Contribute to conservation of biodiversity and integrated approaches to land use planning.
8. Facilitate and encourage responsible product design, use, re-use, recycling and disposal of our products.
9. Contribute to the social, economic and institutional development of the communities in which we operate.
10. Implement effective and transparent engagement, communication and independently verified reporting arrangements with our stakeholders.

The mining industry's critics maintain that the costs of resource development often outweigh the benefits, and the industry is aware that, in many cases, the socio-economic performance of mineral-dependent developing economies has been poor. But a groundbreaking 2005 study released by the ICMM has found that mining has significant potential to drive economic growth and poverty reduction in mineral-rich states under the right conditions. The research found that, particularly for the poorest countries, mining can provide opportunities for early-stage development that other industries do not offer. For example in Ghana since the mid-1980s, a boom in mining investment has coincided with an upturn in economic growth. As a result, poverty has fallen, especially in regions with a high level of mining activity (International Council on Mining and Minerals, 2006).

The most important finding of the study, however, is that industry cannot achieve this by working alone. The key is to strengthen the focus on managing and utilizing the generated revenues transparently and effectively, at the national, regional and local levels of the host countries. At Newmont, the focus is not only on internal commitments and programs, but also on the integration of government, business, and civil society (see Figure 1 below) in an effort to

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strengthen economic management, governance, and participative institutions at the regional and local levels

In 2002, at the World Summit for Sustainable Development, nine of the world's largest mining companies initiated an independent project to examine the role of the minerals sector and its current and future contributions to sustainable development. The outcome of the two year independent study by the World Business Council for Sustainable Development and the International Institute for Environment and Development was *Breaking New Ground* (2002), a comprehensive assessment of the sector and its impacts as well as suggestions for becoming more sustainable.

The challenge of sustainable development is clearly laid out in relation to an industrial sector like mining. It is an industry society cannot do without, so how does one define a higher standard for operating and develop the rules and incentives to achieve it? The report lays out seven critical challenges:

- **Viability.** The sector has to find ways to succeed by delivering a safe, healthy, and educated workforce, having access to capital, earning a 'social license to operate', and gain a return on investment.
- **Control, Use, and Management of Land.** A planning process is needed that balances competing interests of national and local groups, indigenous peoples, mining and conservation, and is sensitive to issues of resettlement and protected areas and species.
- **Economic Development.** While there is potential for alleviation of poverty and to create development opportunity, issues of corruption, human rights, and conflict must be dealt with.

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- **Local Communities.** While development can bring benefits to local communities, social tensions must be factored in, and the planning cycle must extend beyond the life of the mine to create long term sustainable development.
- **Environment.** Even the most modern environmental operations can leave undesirable environmental consequences. But, ways must be found to mitigate damage as much as possible and assure critical natural capital is protected and ecosystems enhanced.
- **Integration.** Companies must work up and down the chain to improve design of products and processes to maximize re-use, recycling, and re-manufacturing.
- **Access to Information.** This is the key to building greater trust and cooperation among stakeholders.
- **Artesian and small scale mining.** Millions of people make their living here, but it is characterized by low wages, unsafe working conditions, environmental impacts, and exposure to hazardous materials.

CONCEPTUAL MODEL OF SUSTAINABLE DEVELOPMENT

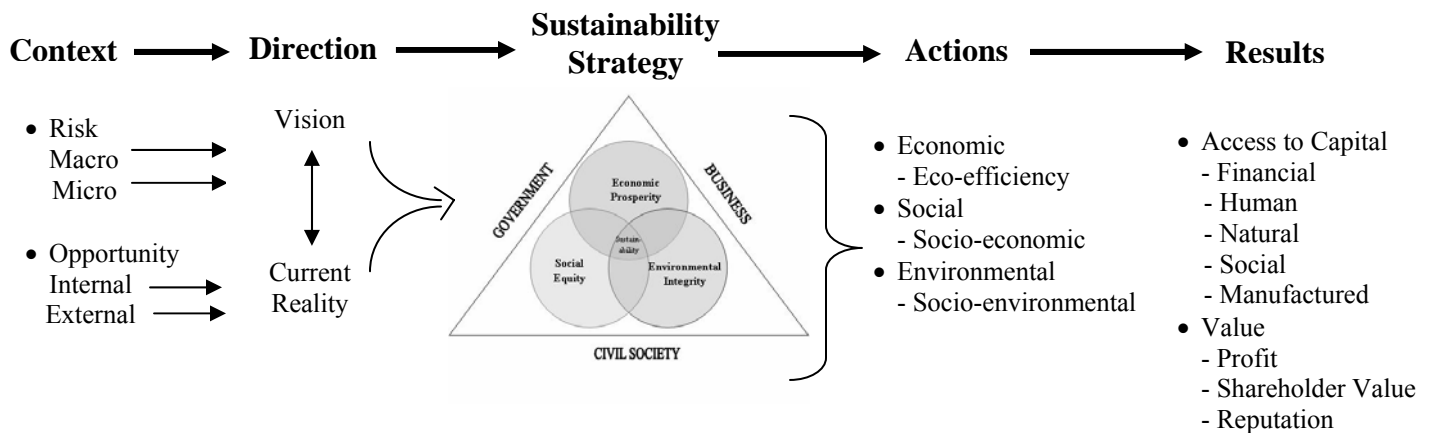
The central conditions for a conceptual model of sustainable development can be found in the evolution of definitions of the term. The definition in *Our Common Future* provides a central mission—to meet the needs of present and future generations equitably. Ten years later, the International Institute for Sustainable Development defined it as the “...adoption of 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.” This definition clarifies whose needs in terms of both the enterprise and societal stakeholders, ups the ante on the mission by clearly stating maintaining the status quo is not enough and that activities should also be enhancing, and provides the concept with a strategic focus, not a social

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mission. In 2002, the Mining, Minerals, and Sustainable Development Project defined the concept as, “Integrating economic activity with environmental integrity, social concerns, and effective governance systems.” This definition makes two important contributions. It specifically recognizes the integrated nature of the dimensions of sustainability and directly addresses the vital issue of governance.

The model presented in Figure 1 attempts to address these and other issues important to the successful implementation of corporate responsibility strategies aimed at contributing to sustainable development. Key aspects of the model are discussed below.

FIGURE 1
Sustainable Development Process



Sustainable Development Strategy is the heart of the model. In 1992, the UN Conference on Environment and Development was held in Rio de Janeiro. Rio established the “three pillars” of sustainable development—economic, social, and environmental (represented by the circles in the model). The economic dimension recognized the value of the market as a foundation for social and environmental progress and for signals related to human needs, demand and supply, risk, and scarcity. The environmental dimension recognizes the necessity of maintaining and enhancing ecological systems for both their intrinsic value and as critical to long term economic

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and social progress. While the social dimension was given little attention at Rio, it represented the growing social problems later articulated in the Millennium Development Goals, inequities world wide between developed and developing countries, and the subsequent barriers to economic progress and environmental integrity they represented.

The overlap of the circles in the model represents the interdependency of the three pillars. For example, shareholder returns, net cash flow, market share are typical economic metrics, but things like job creation, local economic impacts, and ethical behavior in the community are socio-economic, contributing to both social and economic pillars. Similarly, resource efficiencies and life cycle costing are examples of eco-efficiency measures that positively impact the environment and the bottom line. The intersection of environment and social might contain activities around safety and health of employees, pollution reduction in the community, and/or contributions to reducing climate change impact. Direct environmental activities might be internal strategies to reduce waste and regulatory compliance. Socially related activities could include diversity practices, human rights, conflict prevention, and education.

When sustainability is viewed from such an integrated perspective, it is less likely that decisions will be made regarding any one area without thinking about and factoring in the consequences to the other dimensions. It also helps create an environment for innovative thinking about how to create new processes, strategies, and actions that may positively impact multiple stakeholders, provide competitive advantage, and reduce both political and financial risk.

The boundaries of sustainable development are a function of the actions and interactions of the three central sectors of society—business, government, and civil society. The governance structures within each sector have a major impact on the ability of the firm to operate in a

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sustainable manner. Governance, in general, describes the capacity, or efficiency, of an organization to design, implement, and enforce policies to achieve its mission, goals, and objectives. Governance has sometimes been referred to as the fourth dimension of sustainable development.

For governments at the local, state, national, and international levels this means designing, implementing and enforcing consistent public policies that benefit the public and improve the effectiveness of the private sector. Falling short of objectives may be due to the differences in governance between the levels, poor execution, corruption, or the lack of laws and/or national policies or the infrastructure to enforce them. The International Council on Mining and Metals reports characteristics that define good governance structures for governments are a credible state with administrative capacity, limits to state strength, compatibility with formal and informal institutions, formal economic institutions that oversee markets, and technical capacity (Dalton, 2006).

For business, the pressures can be both internal and external. A recent report by Citigroup (2006) suggests that “sustainability governance”, designed to ensure that best practices and lessons from projects companywide can be replicated around the company’s portfolio, is a primary cause of adding or destroying company value. Components of the system include management commitment, strategic outlook, integrated management system, risk management, innovation, and transparency. Externally, decisions by the firm are subject to familiar market pressures, such as competitor and supplier actions, as well as industry factors, such as trade association positions and other representatives of “business.”

Civil society is the most difficult to define of the three sectors, and yet there is little argument it plays an increasingly important role in shaping public perceptions of the importance

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of sustainable development and what actions should be taken to become sustainable, including supporting or not supporting companies and governments whose behaviors are viewed as anti-sustainable development. One definition is “the sphere of ideas, values, institutions, organizations, networks, and individuals located between the family, the state, and the market and operating beyond the confines of national societies, polities, and economies” (*Global Civil Society*, 2001). Consequently, civil society encompasses a wide array of entities from international membership organizations with thousands of members and huge budgets to single individuals in a community. The most recognizable civil society type is the Non-governmental Organization (NGO). While such organizations have little formal power in the same sense as governments or businesses, they are tremendous catalysts for developing networks with other groups for rallying public opinion and taking action to support causes

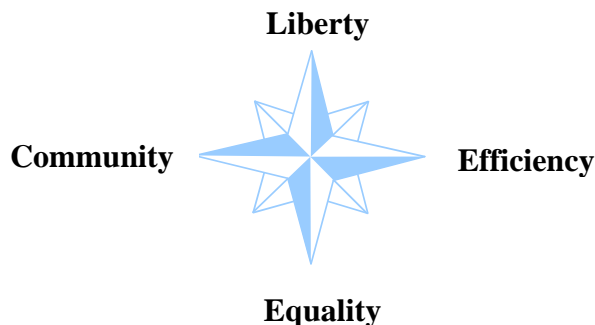
The three sectors act as checks and balances on each other with regard to the policies and practices of sustainable development. Most often, the tension between sectors is the result of values conflicts. While all three sectors typically embrace a set of common values, at any one point in time one sector may place so much weight on a particular value that it causes harm to the others. James O’Toole in his book, *The Executive’s Compass* (1993), uses the metaphor of a compass to demonstrate the values in tension.

He makes the point that the task of every legitimate government is to secure the good society for its citizens. The problem, of course, is that the definition of a good society differs across players and circumstance, making it impossible to please everyone. The key is to have a system in which all stakeholders feel they get a fair hearing, and in which commonly held values will be maximized over time. Four common values identified in Figure 2 are positioned on each point of the compass. They are Liberty, Efficiency, Equality, and Community. These are values

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that everyone admires, but they also are in constant tension. The community value associated with environmental preservation may conflict with business needs for resources (e.g., oil and gas drilling in ANWR). Or, liberty conflicts with community on the issue of wire tapping and security against terrorism. In general, business most often resides in the northeast quadrant of efficiency/liberty while civil society is more often focused in the southwest quadrant, concerned with issues of community and equality. Government is generally patrolling the north/south axis of liberty/equality. The conceptual model of sustainable development recognizes the natural tensions arising from these common values and reminds us that reconciliation is a constant struggle, just like the overall process of sustainable development is a dynamic process that varies with circumstance and players.

FIGURE 2
Values Compass*



*Adopted from: *The Executive's Compass: Business and the Good Society*, James O'Toole, 1993.

The drivers of the sustainable development strategy are the context in which the firm finds itself and its overall direction. Context is defined by risk and opportunity. Examples of macro risk factors facing the firm are competing political systems, conflict, social unrest and disorder, and newly created alliances. Micro risk could be changing market conditions, unstable economies, or vested local political/business interests (Aaker, 1984). Opportunity arises from either internal or external conditions. Internally, the firm may have increased its flexibility

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through newly accessed forms of financial capital, developed new processes and procedures that increase efficiencies of production and operation, or other means to enhance competitiveness. Externally, opportunities can arise through the development of new alliances or market shifts in demand, or changes in trade policies by the government either internally, or through treaty.

The Direction the firm takes is a function of its overall vision as a company in terms of the kind of company it chooses to be, what it wants to accomplish, and how it will get there. This vision is mediated by current realities of both the firm's state and the markets in which it is operating.

A clear understanding of both context and direction provide the foundation for developing the Sustainable Development Strategy. The Actions coming out of the strategy are developed from consideration of the individual and interconnected dimensions of the model. Pure economic actions might be setting pricing strategies to drive revenue or market share. Environmental actions could be reducing waste to comply with regulations. Social actions might include increasing the diversity of the workforce or engaging in conflict resolution programs to promote peace. Other actions cross over dimensions and serve multiple goals. Socio-economic, at the interface of economic and social, might include job creation or worker training programs. Eco-efficiency might be actions to reduce energy use or adopting life cycle costing processes. Socio-environmental actions would be associated with plant health and safety or actions to improve the local environment.

This combination of Actions leads to results. A critical result for any firm is access to capital. The value of financial and manufactured capital is well documented. What firms are experiencing more often in today's environment is the critical value of human, social, and natural capital. Human and social capital allows the firm to operate more safely, effectively, and

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efficiently. Natural capital is not only needed as inputs to the business process but has value in and of itself. Critical stakeholders from investors to community members demand firms protect and enhance the environment by using cradle to cradle technologies, processes that do not pollute or endanger species, and contribute to solutions to environmental problems such as climate change.

The other result is how a sustainability strategy creates value for the firm. While there is a good deal of discussion regarding the triple bottom line (Elkington, 1998), the fact is that the firm has a single bottom line, profitability. Strategic environmental and social actions feed this single bottom line increasing firm value through environmental stewardship and promoting social equity in ways that serve both shareholders and larger social good. By doing so, the value of the firm is enhanced through an improved reputation and brand image among key stakeholders. For mining companies, this is nowhere more in evidence than in access to land and the ability to operate over time.

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How the company's management incorporates these issues into its decision making process is critical. The most common decision making tool used by companies to allocate its capital is based on a discounted cash flow (DCF) methodology. Kim and Ulferts (1996) surveyed the academic articles that determined the capital budgeting techniques actually used by multinational corporations, and show a trend in favor of DCF techniques, notably internal rate of return (IRR) and net present value (NPV). These two decision models evaluate projects using the same inputs, and the decision criteria for each will give consistent accept/reject signals

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concerning projects. This paper focuses on NPV as a decision model as it evaluates the project being considered in the context of its impact on firm value.

Prior to the evaluation of the project using NPV, of course, the company must identify projects that are appropriate for it as part of its strategy. The project must fit into the overall strategic plan for the company. Management will evaluate the **Context** of the project, identifying the opportunities offered by the project and accompanying risk. The opportunity can be caused by an internal factor such as an efficiency gain in an aspect of production, or an external factor such as a change in market dynamics caused by a change in pricing of the product. Risk can be micro in nature, such as production variances and changes in factor prices, or macro in nature such as political risk from operating in a foreign country. These risks will need to be identified so that they can be incorporated into the decision model later.

Miller (1992) adopts the term ‘uncertainties’ to refer to the unpredictable nature of the operating environment in which companies operate, and then categorizes these uncertainties according to their source. His three major categories are General Environmental Uncertainties, which include political instability, policy instability, uncertainty within the macro economy, social instability and natural instability; Industry uncertainties which incorporate many operating environment uncertainties from input markets, product markets and the competitive nature of the industry; and Firm uncertainties which incorporate firm operating activities. While the focus of this approach is different from that developed in this paper, these uncertainties are representative of the risks that should be identified and evaluated by the firm’s management.

In determining whether the project fits into the overall strategy of the company, management will also need to evaluate the **Direction** of both the company and the project. The vision of the company, articulated in the strategic plan, is sometimes limited by the current

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reality of the market and other potential constraints. The company will need to evaluate the current reality, such as access to product markets, access and costs of inputs, availability of financial and human capital, and the current state of its social capital, and whether the project is feasible and/or desirable within this framework. In addition, management must determine whether the project can move the company closer to its vision.

The project then needs to be evaluated within the context of whether it is acceptable. This evaluation requires management to determine whether, within the context of the sustainable development model, the project has a positive NPV. The NPV of the project is evaluated using the following equation:

$$NPV = \sum_{t=0}^T \frac{PCF_t}{(1+k)^t} \quad \text{Eq. 1}$$

Where

NPV is the net present value of the project,

PCF is the project's cash flow (discussed in detail below),

k is the company's required rate of return, normally the cost of capital,

T is the estimated useful life of the project, which can be a finite time period (such as an equipment purchase) or can be estimated to be perpetual (opening a subsidiary)

This equation, though simple in structure, is intended to capture the complexity of project analysis, and should be able to incorporate the impacts of the sustainable development model presented so far.

Life of the Project

As a starting point, the relevant time period in the model is theoretically applied as the expected life of the project. This can be as simple as the decision to purchase a lap-top computer

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for an executive that travels, and which has a very short expected life, to a complex estimate by companies such as Newmont that must evaluate the engineering of the gold mine being developed to gain an estimate of the life of the mine. The inputs into this decision range from the size of the discovery to the price of gold prevailing at the time, which affects the dimensions of the mine itself. Even more complex would be the creation of a European Union based subsidiary for manufacturing and distributing a company's products, which could be estimated to have an open-ended life. What should not be lost here is that the company, in evaluating the project, must take into consideration the entire life of the project, not simply the opening few years. This comprehensive view of a long-term project begins to bring into focus the importance of structuring the project and the decision on a sustainable development framework. In either the Newmont example, or the manufacturing company example, a failure to consider the pressures of the model presented in Figure 1 can cause a negative impact on the value of the project.

Project Cash Flows

The evaluation of the project's cash flows (PCF) is the heart of the analysis. These cash flows can be broken into three different stages of cash flow. First is the initial investment requirement of the project, second is the periodic operating cash flow from the project, and third is the terminal cash flow that occurs at the end of the project's life. Each of these should be evaluated in the context of its relationship to the economic, social and environmental impact, and must react to the pressures applied by government, civil society and business sectors.

Initial Investment Cash Flow. The initial investment cash flow (ICF) begins with a simple identification of property, plant, equipment, working capital, and intangible investment needed for the project. For many companies, this is a very routine assessment of the needs of the project. However, at this stage evaluating these requirements through the lens of the sustainable

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development model will lead the company to evaluate such factors as environmental impact, efficiency, training requirements, and impact on the workforce. Planning at this stage can create company wide efficiencies, or identify workforce changes (positive or negative) that require a strategy for implementation. In addition, the impact of the project on the local community needs to be anticipated, and a plan for managing this impact should be developed with the appropriate stakeholders. An example from Newmont of these costs and issues will be presented below as a case study.

Periodic Operating Cash Flow. The periodic operating cash flow (OCF) of the project is normally what initiated the evaluation of the project in the first place. The opportunity to sell products in a new market, efficiency gains from a new process or set of equipment, development of a new product, productivity gains from a training program, and many other opportunities, are first identified from the potential impact on the OCF. There should be an identified OCF for each year of the project's useful life. It is calculated as:

$$\text{OCF} = (\Delta \text{Rev} - \Delta \text{Opr} - \Delta \text{NC})(1 - \text{tax}) + \Delta \text{NC} - \text{Inv} \quad \text{Eq. 2}$$

Where

ΔRev is the impact of the project on revenues,

ΔOpr is the impact of the project on the cash operating expenses,

ΔNC is the impact on non-cash expenses (like depreciation),

tax is the marginal tax rate of the company, and

Inv is any additional investment in either long term or short term assets.

The delta function in the equation reflects that, in capital budgeting, the focus is on the incremental effect of the project, which would include both direct and indirect effects. Thinking through this equation, it is easy to see that not only the obvious impacts of the project are

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incorporated (units sold times price per unit), but also the impact of incorporating operating opportunities and challenges resulting from the application of the sustainable development criteria as well. As a simple example, the necessity to incorporate pollution control devices in the manufacturing process would impact the Opr variable (and, of course, the NC variable as the company takes depreciation against the cost of the devices). The impact on the Opr variable could, of course, be either positive or negative. If the devices increase the cost of operations, then the impact would be negative, but if it makes the process more efficient with respect to maintenance and cleanup, then the net impact could be positive. In addition, if the devices reduce licensing and fee costs associated with operating in the community, this savings would be incorporated into the evaluation as well.

Many of the risk reducing activities engaged in by multinational companies, as suggested by Stonehill and Nathanson (1964), Kelly and Phillipatos (1980), and Oblak and Helm (1980) go to trying to control the risk associated with these OCFs. Such techniques as negotiating the operating environment and structuring the investment (Oblak and Helm, 1980) are ways of reacting to the identified risks, but there is no indication of how to identify the risk, or what needs to be negotiated. By evaluating the project's OCF through the sustainable development model, these can be much more easily identified and the appropriate stakeholders can be chosen to help with the risk control.

Terminal Cash Flow. At the end of the project's life, there is a wrapping up impact on the cash flow of the project. Some elements of this terminal cash flow (TCF) will be positive, such as selling property, plant and equipment for salvage or scrap value. Some will be negative, such as land remediation or labor force retraining. The company must forecast these impacts as accurately and comprehensively as possible, because in many ways this wrapping up of a project

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can have a significant impact on the social and environmental forces affecting the company, and can impact the ability of the company to continue operations into the future.

There is also a potential for the TCF to be affected by actions taken during the life of the project. Pollution control devices, which may have a negative impact on the OCF, can reduce the cost of remediation at the end of the project's life, reducing the negative TCF impact. For natural resource companies such as Newmont, this TCF can be a very significant aspect of the project evaluation, and can affect the operating characteristics of the project itself.

So, the PCF stream is comprised of ICF, OCF and TCF. The sustainable development model can and will have an impact on each of these, and each should be evaluated through the filter of the model. How does the company react to pressures from NGOs, concerning the Social aspect of the model? What must the company do to comply with Government requirements with respect to Environmental Regulation? These types of impacts must be incorporated into the calculation of the PCF, so that the company can apply the NPV model to the project.

Cost of Capital

The cost of capital is reflective of the firm's opportunity cost of funds. It reflects the required rate of return for the various investors in the company, including both debt investors (banks, bondholders) and equity investors (common stock). These investors will evaluate the risk of the company's operations, the claim that the investors have on the cash flows of the firm, and how the investment fits into the investors' portfolio, and will determine their required rates of return. The company is in the position of having to provide that required rate of return to the investors, and so must ensure that it invests its capital at a rate sufficient to meet that requirement. The NPV model uses this cost of capital as the discount rate for calculating the present value of the PCFs, and so a positive NPV would mean that the project is earning in

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excess of this required rate of return – a negative NPV (and therefore an unacceptable project) is earning less than the required rate.

One method of adjusting the NPV analysis to reflect increased risk of multinational investment is to adjust the required rate of return – the discount rate – to a higher return than that required by the cost of capital (Kim and Ulferts, 1996). This will have the impact of reducing the discounted value of the PCFs, reducing the likelihood of the project being acceptable. If evaluating the project through the sustainable development model can reduce this risk, then the requirement to increase the discount rate is lessened. This relatively lower discount rate will result in a larger value for the project, and the firm.

Once the project is determined to be acceptable, management will need to take the necessary Actions to implement the project. This will include structuring agreements with various stakeholders, assessing impact and implementing strategies to control the impact on the environment, on society, and on the economic strategies of the company. This can be a very detailed operation, and requiring a significant set of activities by the company.

Following the implementation of the project, significant follow-up and post-audit of the Results is necessary. There can be impacts, positive and negative, on the current reality of the company that flow from the project. Notably, access to capital, broadly defined to include financial, human and social, can be positively or negatively impacted by the project.

Value of the Firm

All of this analysis has an impact on the value of the firm. An important issue in determining whether a firm should engage in sustainable development as a strategy is its impact on the value of the firm. The operating environment for the firm includes as one of its elements the economic dimension. This economic dimension imposes on the firm the rigors of market

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competition not only for markets and inputs, but also for investment capital. The financial goal of increasing shareholder value is not overridden by the requirements for sustainable development, but rather must incorporate these requirements into the application of the financial goal.

Since Modigliani and Miller (1958), the value of the firm has been recognized to be determined by the present value of the operating cash flows generated by the firm. This definition so permeates finance literature that a full development is not presented here. For our purposes, a working model for this valuation is:

$$V_0 = \sum_{i=1}^n \frac{FCF_i}{(1+k)^i} \quad \text{Eq. 3}$$

Where:

V_0 is the value of the firm today,

i is a time counter, with time running from year 1 through n ,

FCF is Free Cash Flow, discussed further below, and

k is the appropriate discount rate, adjusted for the risk of the company.

The two critical inputs into this valuation model are the FCF and the discount rate. Each of these will be discussed, with a focus on the impact of sustainable development as a strategic plan.

Free Cash Flow represents the cash flows from the company's operations that are available to pay to the various investors in the firm. It is defined (Modigliani and Miller, 1958) as:

$$FCF = (\text{Rev} - VCC - FCC)(1-t) + tDep - NWC - I \quad \text{Eq. 4}$$

Where

Rev is revenues generated by the firm,

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VCC is variable cash costs of operations,

FCC is fixed cash costs of operations,

Dep is non-cash expenses such as Depreciation and Depletion,

NWC is investment in Net Working Capital; that is Current Assets less Current Liabilities,

I is capital expenditure in excess of replacement (measured by depreciation), and

t is the marginal tax rate.

As can be seen, this is simply the cash flow generated by the firm from operations, less the investment in both current assets and long-term assets to allow for growth in the company from period to period. Many have criticized elements of sustainable development as imposing simply a cost on the firm, for example improvements in the handling of environmental waste. However, there can be two different impacts – one is the cost of handling; the other is the impact on efficiency or the capital investment requirements. This second impact can be enough to offset the negative impact of handling. This is completely fact specific, but both impacts must be identified and evaluated to determine the net impact.

The second critical input into the value of the firm is the discount rate. As discussed above, this discount rate is the rate of return the firm must earn to satisfy the return requirements of all those who invest in the firm. The required returns for these investors include a premium for their perception of the risk of the firm's FCF. For most settings, the firm is treated as having a perpetual life, and so an adjustment must be made for the timing of the cash flows. The cash flow received in year 10 is not as valuable today as the cash flow received in year 1. So, we discount the cash flows by the appropriate discount rate to adjust for this. As can be seen in equation 3, if the discount rate increases, the value of the firm will decline, and vice versa. This relationship is critical to understanding why companies engage in risk-reducing activities. If the

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risk of the firm declines, and investors reduce their required returns, then the discount rate will also decline. This reduction in the discount rate will increase the value of the firm.

Efforts to control the environmental dimension and the social dimension can clearly have an impact on the FCF for any period, as the company expends resources either on a continuing basis (VCC or FCC), or through investment in long-term assets (I). The firm will have to incorporate these direct impacts into its determination of its strategic plan. However, there are also going to be indirect impacts from the successful management of the environmental and social dimensions that lead to sustainable development. FCF can be increased by the improvements and efficiencies created by the investment, which could fully offset the direct impact of the investment. Future investment in projects can have the cost reduced, as the company rolls the improvements and efficiencies forward into these future projects. Societal costs especially can be reduced as the firm effectively manages the interaction between the environmental dimension and societal dimension. In addition, the community may determine that the types of societal investment made by the company are advantageous to that community and reduce up front costs and regulatory burdens to the company as it expands.

Another indirect impact of successfully managing the environmental and societal dimensions of the firm's operating environment is the potential to reduce the required rate of return, thus having a positive impact on the value of the firm. This risk reducing impact can be the result of lowering the operating risk of the company, by reducing the firm's exposure to environmental risk from its operations, or societal risk in the form of changing regulations and relationships with the community.

An industry where these impacts are clearly illustrated is the gold mining industry. At any point in time, the value of the firm is determined by the present value of the forecasted FCF

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over the life of the firm. This life of the firm, which seems explicitly different from other types of industries, is based on the reserves owned or controlled by the firm. These reserves, by their nature, are a very discrete amount. Thus, the life of the firm at any point in time is simply the total number of reserves divided by the annual production. To illustrate, suppose that a firm has 50 million ounces of gold reserves, and produces 2.5 million ounces per year. This gives the firm a discrete life of 20 years. If the company is unable to gain access to new projects, it will be out of business at the end of the 20 years. Gaining that access to new projects requires an active management of all three dimensions of sustainable development, and the successful management of the outside influences that have an impact on these dimensions. As the expected life of the firm increases, so does its value.

This somewhat extreme example of the need to successfully manage the operating environment in which it finds itself is not unique to gold mining, or even other natural resource industries. The external stakeholders identified in Figure 1 can affect and even terminate the continuing operations of a company that does not meet the requirements and pressures of the sustainable development model. There are numerous examples playing out in the daily headlines of companies that risk their ability to operate in the future by ignoring all three dimensions of sustainable development.

The impact of actively managing through the sustainable development model illustrated in Figure 1 can be measured by the impact on the value of the firm. If the company engages in actions to manage the process, the new value of the firm will be:

$$V_0' = \sum_{i=1}^n \frac{FCF_i'}{(1+k')^i} \quad \text{Eq. 5}$$

Where

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V_0' is the value of the firm actively managing the three dimensions of the sustainable development model,

FCF_i' is the Free Cash Flow adjusted, and

k' is the discount rate, adjusted for the new level of risk.

Engagement in active management of the three dimensions of sustainable development will be financially successful so long as $V_0' \geq V_0$. Calculating V_0' also provides a measure of the financial return of sustainable development activities and may help determine the optimal level of activity and expenditure. The example below shows the sensitivity of V_0 to changes in FCF.

Example Data:

REV = \$100,000

VCC = 20% of Rev

FCC = - \$60,000

$\tau = 40\%$

Dep = \$10,000

NWC = \$1,000

I = \$5,000

n = 10

k = 15%

With these values,

$$FCF = (100,000 - 20,000 - 60,000)(1-.4) + .4(10,000) - 1,000 - 5,000 = \$10,000$$

$$V_0 = \sum_{i=1}^{10} \frac{10,000}{(1+.15)^i} = 10,000 (5.019) = \$50,019$$

Suppose the firm expends an additional \$2,000 per year on sustainable development activities. This expenditure would cause V_0 to decrease to $V_0' = \$44,167.2$, a decrease of 11.7%.

For V_0 to increase, there would have to be a decrease in k. That is, this activity would have to reduce the risk premium within k. How large must the decrease in k be to keep V_0 from falling?

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The answer is shown in the table below which shows the new V_0' for various values for k.

Table 2. Example Results 1

k	V_0'
15%	\$ 44,167.2
13%	\$ 47,748.8
12%	\$ 49,720.0
11%	\$ 51,823.2

As the table shows, k has to decrease to 11% to offset the increase in the fixed cash costs.

This represents a 27% decrease in k, which may be difficult to achieve.

If the expenditures can also have positive impacts on efficiency or capital investment requirements, then the decrease in k does not have to be as significant. In the example above suppose that VCC decreases to 19% of Rev and I decreases to \$4800. With the original value for k of 15%, V_0' is \$48,182.4. The table below shows the value of V_0' for various values for k.

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Table 3. Example Results 2

k	V_0'
15%	\$ 48,182.4
14%	\$ 50,073.6
13%	\$ 52,089.6

The table shows that now a reduction in k to 14% will keep V_0 approximately the same. If the risk premium reduction causes k to fall to 13%, a decrease of 13% then V_0' will increase by 4% over its original value of \$50,019. The use of this valuation model can enable the firm's management to test the impact on V_0 of all types of sustainable development strategies that may impact VCC, FCC, NWC, I, and k .

Thus, to the extent utilizing the sustainable development model creates value in the firm the management of the firm should incorporate this model into its strategic planning process. And, as should be easily seen, the capital budgeting process is overlaid onto the value of the firm, due to the incremental approach taken in calculating the OCFs of the project. So, the impact of meeting the requirements of the sustainable development model are fully incorporated into the value of the firm, and the decision making process associated with new projects.

The Sustainable Development model created here describes the dynamic process that companies must engage in order to operate more sustainably. Unfortunately, sustainable development is neither an end state nor subject to hard and fast rules or mathematical modeling. Instead, the process relies on information to determine the right inputs and outputs. As a process, we have identified seven key success factors in applying the conceptual model of sustainable development as part of the overall strategic planning process of the firm. Each has

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both an internal organizational and external outreach dimension, and current weaknesses in these factors are described.

Trust. All three sectors have engaged in actions that have reduced public trust and made the development of partnerships harder. Business motives and ethical standards are questioned. Government is seen as inconsistent and corrupt. Within civil society, NGOs sometimes appear self-serving and opportunistic. Internal organizational trust is low due to a deterioration of the relationship between employee and employer.

Integration. Environmental and social issues cannot be treated independently from economic considerations. Internally, they impact operational costs and employee health and productivity. Externally, they have competitive implications and impact reputation and brand image.

Cooperation. The Johannesburg Sustainable Development Summit and the UN Millennium Development Goals both recognize the value of intersector partnerships and alliances across the supply chain. Internally, collaboration across departmental lines and organizational units is key to integration of sustainable solutions within the organization.

Governance. Transparency in reporting and involvement in issues of sustainability at all levels of the organization, including the Board is essential.

Outreach. Community involvement increases the firm's social license to operate. Promoting employee volunteerism and community participation impacts both employee productivity and community support.

Research and measurement. Internal monitoring and external evaluation of performance among different stakeholders provides important information for continuous

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improvement. Formative research can be used to development corporate responsibility programs, while summative research provides benchmarks and performance feedback.

Communication. Internal and external communication strategies are essential. Good communication within the organization is essential to learning and morale. Externally, stakeholders, such as customers and community members increasing make decisions to purchase products, invest in stocks, etc. based on the reputation of the firm in terms of its social responsibility and sustainable development actions.

Improving each of these factors will enable companies, governments and elements of civil society to better work in partnership to achieve sustainable development. It will take a conscious effort by each to do so.

CASE-STUDY EXAMPLE FROM NEWMONT MINING

The Sustainable Development model developed in this paper is rapidly becoming a part of the culture of Newmont. That this is the case is best captured in the words of Chairman and CEO Wayne Murdy: “Success in the area of environmental and social responsibility and sustainable development adds shareholder value in the form of continued access to land, deposits and capital. Failure, on the other hand, leads to shut operations, anti-mining activism, mistrust, and the destruction of shareholder value.” Some background on the Yanacocha Mine in Peru will give some context to a current dilemma faced by Newmont Mining.

Newmont is the operator and owner of 51.35% percent of the Yanacocha open-pit gold mine in Peru. The mine is located approximately 375 miles north of Lima and 30 miles north of the city of Cajamarca—a city of approximately 120,000. Yanacocha is one of the world’s best

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gold mines. Yanacocha has had an enormous positive impact on Peru and in particular the local communities, including Cajamarca.

Since inception, Yanacocha has spent more than \$2 billion in capital and exploration, paid employers, suppliers, and contractors nearly \$2.7 billion, and paid nearly \$1 billion in taxes to the government of Peru. Yanacocha has also made huge strides in generating funds for the community, employment and training, health and education, and local and regional economic development. Yanacocha has created nearly 10,000 employee and contractor jobs since 1992. Over 85% of the mine's procured goods and services come from Peru. Since 1992, Yanacocha has spent over \$3.6 billion for purchases in Peru, with local Cajamarca purchases now equaling off-shore purchases. The mine also provides medical care for over 7,000 individuals annually, contributing to a 20% reduction in acute respiratory and diarrheal diseases. Yanacocha is educating 6,600 children annually at 76 Yanacocha funded education centers while providing transportation for 462 teachers to help future generations of Cajamarquinos. Additionally, Yanacocha has provided tremendous improvements in infrastructure, through roads, electrification, sewer systems, and integrating infrastructure and programs.

These benefits reflect Newmont's long-standing commitment to sustainable development and poverty reduction in the communities and host countries where it operates. And yet, for all this, the company was painfully reminded that risk assessment and social license are constantly evolving processes where failure to understand and proactively manage all issues can have immediate and lasting impacts on the value of the firm.

In 2004, Newmont was exploring and drilling the Cerro Quilish deposit within the Yanacocha complex. The deposit contained approximately 4 million ounces of proven and probable reserves, and work was progressing toward development of the deposit for initial

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production in 2008. In September of 2004, however, residents of Cajamarca conducted a sustained blockade of the access road to the mine causing the company to have to suspend operations. The protestors claimed that that the Quilish project threatened the water sources in the water shed serving Cajamarca — something the company’s data and baseline environmental science entirely refuted.

Nevertheless, with overall mining operations threatened and a sense that convincing the local populations of the safety of their water would be a long-term process, Yanacocha asked the Peruvian Ministry of mines to withdraw the company’s exploration permit for Quilish and committed not to explore or mine the deposit without community support—something it has not received to date.

The economic impact of failing to assess and address the issue of water impact in the Cajamarca region and the loss of the Quilish project were indeed significant and readily quantifiable. A 2004 Cerro Quilish mine plan cash flow analysis shows that assuming average gold prices of \$350/oz, the project had an estimated after-tax NPV of \$182 million at a 7% discount rate and an after-tax project IRR of 70%. At today’s gold prices of nearly \$600 per ounce, and not accounting for increases in capital or operating costs, the project would have an approximate \$544 million NPV or nearly \$1.22 per share and an after-tax IRR of 149%. When you factor the nearly 2 times NAV multiple that gold companies typically trade at, one can argue that at today’s gold prices, the loss of Cerro Quilish cost the company nearly \$1 billion in market capitalization.

Today, the company is taking no chances on the issue of water quality and availability for the local communities and is taking nothing for granted when it comes to community acceptance of a new project. At its Conga project, also located near Yanacocha, the company is taking a

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very proactive, long-term approach to socialization of its project, particularly with respect to water. The Conga project is not slated for production until 2011 or 2012, but already the company is expending significant sums to prepare the local community and seek its acceptance for the mine, and to ensure that the water supply and quality are not just preserved, but enhanced as a result of the project.

Specifically the company has budgeted \$32 million for upfront social investment at Conga, the majority of which is designated for protecting and enhancing the local communities' water systems. The company will be relocating a local lake (Perol Lake) to a new location that doubles the size of the lake. Perol Lake will be exclusively for local community use and will provide more water through the dry season than is currently available. The company is also building dams and diversion canals to control sedimentation and protect community water quality. In addition to Perol Lake, Yanacocha will build two new large reservoirs to serve the mine as well as local farms and villages. The company will also construct facilities to capture water that is currently running-off to the sea to provide more water to the communities year-round. Water used by the mine will be treated with state-of-the-art reverse osmosis and, throughout the life of the mine and beyond, Yanacocha has committed to continual water quality monitoring to ensure a safe and long-term supply of the world's most precious resource to the communities surrounding Yanacocha.

While these programs are expensive and require the company to expend significant sums well in advance of an ultimate decision to mine the project, for Newmont and other natural resources, sustainable development and community acceptance are the sole means by which they secure their future. The key challenge for Newmont is continued access to land. It is the sole means by which Newmont replaces its depleting resource base and preserves the option

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valuation multiples at which its stock trades. When gold companies like Newmont lose operations or are shut down amid community violence and protest, investors' expected returns increase, the company's trading multiples compress, and the firm's performance and reputation suffer. The key to meeting these challenges is the ability to secure acceptance of the host governments and local communities in which Newmont operates in a sustainable and cost efficient manner. As evidence of the importance of sustainable development and environmental and social excellence, Newmont consistently markets its industry leadership in this area as a competitive advantage to Wall Street.

CONCLUSIONS AND RECOMMENDATIONS

Companies are discovering that the process of integrating Sustainable Development into the strategic decision process is the only effective way to achieve the benefits associated with it. Sustainable Development is not an end state to be achieved, but rather a continuing process that must inform the decisions of companies every day. The model developed in this paper not only recognizes the three primary forces affecting Sustainable Development (economic, environmental and social), but also expands the current model to incorporate the different layers of sector involvement in affecting how companies try to implement Sustainable development. The Business sector exerts influence on the efficiency requirements and competitive nature of each industry in which companies operate. Government, through its regulatory process, has an impact on the company's operations on a day to day basis. Civil society, increasingly represented by the actors at NGOs attempt to achieve goals that can be at odds with the existing business operating environment.

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Businesses must incorporate these actors into their decision models, so that they can operate on a sustainable basis. Whether through the NPV model for capital budgeting, or within the context of the value of the firm, the decision makers at the company must evaluate the operating impacts of the Sustainable Development forces and the actors that influence these forces in order to make consistent, positive decisions.

The mining industry is in some cases an extreme example of the necessity to balance these forces, and operate with the sectors of government and civil society. Newmont Mining has learned, sometimes the hard way, that a failure to anticipate changes in the environmental and societal areas can cost millions if not billions of dollars. This value is lost not just to the investors in the company, but affects the very positive impact that a natural resource company can have on the development opportunities for many countries.

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