

PART I

A FRAMEWORK FOR CHANGE

THE MINERALS SECTOR AND SUSTAINABLE DEVELOPMENT

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One of the greatest challenges facing the world today is integrating economic activity with environmental integrity and social concerns. The goal of that integration can be seen as ‘sustainable development’.

This chapter lays out a proposed sustainable development framework for the minerals sector and considers how it applies to nine areas of concern faced by all actors in the sector – government, industry, labour, and civil society.¹ These concerns are the main focus of Part III of *Breaking New Ground*. The process for moving forward within this framework is discussed in detail in the Agenda for Change in Part IV.

Sustainable Development: Why Now?

The sustainable development concept has grown out of concern about several trends. One is the growing imbalance in development between different countries, often simplified into the categories North and South. Poverty reduction is an enormous global challenge. Almost half of the world’s population – 2.8 billion people – subsists on less than US\$2 per day. Although aggregate development trends have been positive, since 1965 average annual economic growth has been almost twice as fast in low-income countries as in high-income ones – 5.9% a year compared with 3.0%. Average gains in human development in low- and middle-income countries have been higher than gains in incomes: for example, life expectancy increased by 59% between 1950 and 1998 and illiteracy was reduced from 39% in 1970 to 25% in 1998. Yet performance across regions has varied widely: there has been remarkable progress in Asia but no discernible reduction in poverty in Latin America and Africa. In the last decade, poverty rates increased dramatically in the transition economies of Eastern Europe and the former Soviet Union. In parallel, inequality between and within countries has also risen – the ratio of the average income of the richest to the poorest country in the world increased from 9 to 1 at the end of the nineteenth century to about 30 to 1 in 1960 to more than 60 to 1 today.²

Another concern is the high and increasing consumption of scarce resources and resulting pollution, particularly in the most industrialized countries. This concern is compounded by population growth. It has also become clear that economic development that disregards environmental and social

impacts can bring unintended and undesirable consequences, as evidenced by the threat of climate change and loss of ecosystem integrity and biological diversity. Cultures, too, have changed irreversibly – in some cases, nearly disappearing. Indeed, there are countless examples from different sectors and circumstances of the immediate or long-term environmental and social costs of development that have to be weighed alongside the gains. Increased understanding of these concerns has been accompanied by a growing realization that existing institutions are not able to manage these problems effectively unless their roles and responsibilities are clearly defined, appropriate integrated policy frameworks are in place, and there is sufficient capacity to implement change.

In the last decade, these concerns have been brought to a head by a range of trends loosely grouped under the term ‘globalization’. The processes of economic globalization – trade and investment liberalization and the spread of market-oriented development approaches – have created a deeper and broader connection among the world’s nations than ever before. Many have benefited from the process, but to many observers it is the shareholders of large multinational companies of the world who are the principal winners.

The ability of large companies, which operate in many countries and are sometimes hard for individual governments to manage, to influence people’s lives is also feared by many. People often feel disenfranchised because economic activity is increasingly subject to international rather than local forces. The world trading system is seen to be failing to deal with all aspects of market access: industrial countries have in many cases failed to remove perverse subsidies that protect their own interests, and many environmental standards are seen as protectionist. Meanwhile, the capacity of public institutions has, it seems, failed to keep up with the pace of change. The resulting mismatch has contributed to a deep and widespread mistrust of the institutions of governance, both public and private. These are the perceptions of the situation today – right or wrong – and they do matter.

At the same time, international competition, another aspect of globalization, is changing the face of enterprise. Improvements in technology and the efficiency of production challenge those who do not keep pace. These have also reduced the requirement for labour per unit of output in many activities. At a global

level, reductions in employment in some sectors, such as manufacturing and other industrial activities, have been offset by increases in the demand for labour in others, such as the service and information sectors. But in some industries and at the local level, reductions in employment cause significant hardship, particularly in poor countries without social safety nets.

Despite these real concerns, globalization also provides an unprecedented opportunity for change for the better. Although not evenly spread across the globe, it has brought access to new technologies that give people the potential to learn, communicate, and participate in decision-making as never before. The pace of technological and scientific innovation has brought with it new uncertainties and half-understood risks, but also hope for a better world. To capitalize on the opportunities brought by globalization, the wealth and power of the private sector need to be harnessed and steered in a direction that respects social needs and environmental limits and thus contributes to sustainable development.

The minerals sector is part of this web of issues. Many countries and communities depend on minerals production as a source of income and a means of development. And with growing trade liberalization and privatization, much of the investment in minerals exploration and production has turned to developing and transition countries. Mining is important in 51 developing countries – accounting for 15–50% of exports in 30 countries and 5–15% of exports in a further 18 countries, and being important domestically in 3 other countries. About 3.5 billion people live in these countries, with about 1.5 billion living on less than US\$2 per day.³

Minerals development can create many opportunities, including jobs, a transfer of skills and technology, and the development of local infrastructure and services. However, there is sometimes a lack of capacity, knowledge, and incentives to turn investment into development. The industry has generated wealth in direct and indirect ways but, it is alleged, there is a mismatch of opportunities and problems – the wealth often being enjoyed far from the communities and environments that feel the adverse impacts. The operational life of a mine is finite. Unless there is effective planning, the economic and social benefits brought by minerals development may last only as long as the mine, while the environmental damage may

remain indefinitely. The challenge of ensuring that local communities benefit from minerals production becomes more difficult with increasing mechanization and declining employment levels.

There is also concern about disparities in the use of mineral products between rich and poor and, mainly in the North, about ever-increasing demand. These concerns are heightened by the non-renewable nature of mineral resources and fears of eventual depletion. Moreover, the process of extraction may incur social and environmental costs that are considered by some to be unacceptable. The energy used to mine and process minerals is a growing concern in a world preoccupied by climate change.

The mining industry, at least at the level of multinationals, is becoming increasingly concentrated in fewer hands, exacerbating the perceived or real imbalance of decision-making power between them and other stakeholders.

Perhaps the greatest challenge of all is the fact that past practices and social and environmental legacies, combined with continuing examples of poor performance and inadequate accountability, have undermined trust among companies, governments, and some in civil society. The public's perception of what industry is doing is often very different from what company managers think they are doing. As far as some observers outside the industry are concerned, companies have been resisting or at best offering only token improvements: they are seen as failing to meet rising standards of accountability, transparency, and participation.

People in the industry often feel differently. They dispute many of the assertions made about them. They wonder how society can want the products of their industry so much and yet hold some companies in such low esteem. They ask how – in a world of internationally traded mined commodities and one where prices do not reflect all costs – they are going to meet the implicit costs of sustainable development. They also wonder how to achieve a framework of enforced law to control 'free riders' and internalize such costs over time.

Despite these differing perspectives, however, there is a high degree of consensus on some of the fundamental issues. There is recognition of the magnitude of the

challenges and opportunities that exist and of the unacceptable or less-than-desirable distribution of them. There is also a strong desire to improve the quality of life, particularly for the poor. This consensus points to possible ways forward, and sustainable development provides a useful framework for advancing this change.

What Is Sustainable Development?

Sustainable development is one of a range of ideas about how humans should best interact with each other and the biosphere. (See Box 1–1 for a description of the evolution of this concept.)

It involves integrating and meeting economic, social, and environmental goals. The more that unsustainable activities pose unacceptable risks to communities, nations, and humanity as a whole, the stronger the argument for change. Sustainable development has become the logical framework for change and for identifying best practice. As British environmentalist Jonathon Porritt puts it:

Sustainable development is the only intellectually coherent, sufficiently inclusive potentially mind-changing concept that gets even half-way close to capturing the true nature and urgency of the challenge that now confronts the world. There really is no alternative.⁴

The concept has gained widespread currency since becoming the cornerstone of the United Nations Conference on Environment and Development (the Rio Earth Summit) in 1992. It is integral to *Agenda 21* (the blueprint for change adopted in Rio), and to many other international declarations of intent. It will be central to the World Summit on Sustainable Development in Johannesburg in August 2002.

Institutions at different levels have taken on elements of the sustainable development challenge. Governments have increasingly integrated the concept into national planning, and companies are beginning to integrate it into corporate strategies and practice. UN Secretary-General Kofi Annan speaks often of the need for sustainable development to end poverty and environmental degradation. The preamble to the Marrakesh Agreement establishing the World Trade Organization refers to the importance of working towards sustainable development.⁵ In Europe, the Treaty of Rome, which established the European Community, was effectively amended in 1992 by the

Box 1–1. Sustainable Development Roots and Prospects

Particularly over the last century, national governments have been taken to be the prime movers in ensuring domestic prosperity. After World War II, the idea of governments' responsibility for 'development' started to take root internationally, including the notion that richer countries had followed a path to development that poorer countries could also tread, with the help of foreign aid. The motives behind post-war foreign aid were complex. Thinking about development assistance was dominated by both the reconstruction experience in Europe and cold war politics. Aid donors had often conflicting objectives of promoting long-term growth in developing countries and furthering their own short-term interests by helping political allies.

Since the end of World War II, many governments of developing countries saw their lack of physical and human capital as the main obstacle to progress, though even then they worried that the international trading and financial systems were biased against them. The solution was assumed to be government action financed by development assistance. A great deal of aid money went to infrastructure projects and technology, with a corresponding focus on higher education and training. There were some positive results in some countries, but there were also unmitigated failures.

In most countries the record was mixed: projects with poor economic returns as a result of poor planning or management or because funds leaked away through corruption or tied aid, and apparently successful projects that triggered problems such as social displacement, marginalization, and environmental damage. Developing-country debts racked up. The distorted pattern of development heightened inequality in many countries. An economic elite reaped the rewards while the burden of the social and environmental damage was borne largely by the poor and underprivileged. Even in the best cases, uneven development created tensions and sharpened existing cultural, ethnic, or racial divides.

The reaction to these disappointments took many forms. Some activists concentrated on supporting local communities undermined or by-passed by the formal development processes. Other groups argued that development was inherently destructive, and either opposed it completely or fought against mega-projects that threatened pristine areas. And some people worked to improve the theory and practice of development.

The 1972 Stockholm Conference and Its Aftermath

Alongside this development debate was the environmental story. It had begun in the West with a concern over pollution. By the early 1970s the environmental costs of development were recognized. Among the first widely read books on this was *Only One Earth*, by Barbara Ward and Rene Dubos, which explained for a popular audience the concerns that had led to the 1972 UN Conference on the Human Environment in Stockholm.^a The book considered, for example, what would be needed ‘to maintain the earth as a place suitable for human life not only now but for future generations.’ Also in 1972 the Club of Rome, a group of scientists that had been established in 1968, published its first major report – *Limits to Growth*. Although this overstated the speed with which the world was exhausting many natural resources, particularly minerals, it was an important precursor of modern debates.

Following Stockholm, environmental concerns moved up the political agenda in industrial countries. Many argued that focusing solely on rapid economic growth would cause so much environmental damage that it would restrict future growth. Others pointed out the link between environmental damage and poverty – poor people displaced to the most marginal land could be driven to overexploit it, cutting trees for firewood, for example, and exacerbating soil erosion. The natural environment could suffer from both overdevelopment and underdevelopment.

These debates on environmental degradation continued through the 1970s. One significant reflection was a joint effort by the UN Environment Programme, the World Wildlife Fund, and the International Union for Conservation of Nature and Natural Resources. In 1980 they jointly presented the *World Conservation Strategy*, arguing that local groups needed rights over their own environment and benefits from development: ‘For development to be sustainable, it must take account of social and ecological factors, as well as economic ones; of the living and non-living resource base; and of the long-term as well as the short-term advantages and disadvantages of alternative actions.’^b

The notion that environment and development were not so much in conflict as interdependent signaled a radical shift for the early environment movement and established the importance of ‘sustainable development’. Development advocates, including those in the South, began to focus more on the spectacular failures of some development projects, sometimes due to unforeseen alterations of the environment.

Still, demand for economic growth remained stronger than calls for environmental protection. Economic imperatives grew even stronger during the early 1980s. Internationally, a new tone was set

by the Reagan and Thatcher administrations, with the World Bank and the International Monetary Fund (IMF) prescribing similar ideas to developing countries that needed finances: deregulation, economic liberalization, and export-led economic growth.

An important counter to these ideas appeared in 1987, when the World Commission on Environment and Development presented its report. *Our Common Future* (known as the Brundtland Report) returned sustainable development to the international agenda. The Commission’s members were not only conservationists but also important figures in international development who insisted that ‘progress’ should be judged by more than naked economic growth as conventionally defined.

The 1992 Rio Conference

The Brundtland Report also fed into an emerging political and economic commitment to environmental concerns, culminating in the 1992 UN Conference on Environment and Development held in Rio de Janeiro. The Rio conference accelerated agreements on climate and biodiversity as well as setting out a new style of development as laid out in Agenda 21. But it did little to convert the principles of sustainable development into action and paid too little attention to social development. Suggestions that developing countries that adopted more environmentally friendly agendas would get more aid came to nothing.

In retrospect, Rio was the last time the international community believed that collective government decisions could save the world. After 1992, the role of states became to establish enabling frameworks for markets and civil society. Their task was to juggle the goals of economic efficiency, social equity, and environmental quality. The balance of resource flows to developing countries also shifted. In the early 1990s, around half the investment funds going to developing countries arrived as official aid; by 2000, it was just 13%, with most of the rest from private sources.

But Rio did establish the ‘three pillars’ of sustainable development: economic, environmental, and social. The first pillar uses the market to signal the relative scarcity of goods and services and create a robust economy that can serve as the foundation for social and environmental progress. Rio also validated the environmental pillar, probably its greatest achievement: the development process, if it was to yield lasting results, had to safeguard life-support systems, use renewable resources within their regenerative limits, and respect the capacity of ecosystems to absorb and break down wastes. It also recognized the value of the diversity of nature. While these disciplines place some limits on economic activity, they also allow more opportunities for human creativity, and will ultimately

give a better result. But the 'social' pillar of sustainable development was not developed much further in Rio, perhaps because its advocates were not as well organized as their economic and environmental counterparts. Exploring social issues went little beyond rhetorical statements about tackling poverty and lessening the impact of western consumption. Rio coincided with the beginning of a recession in western industrial countries, reining back the prospects for reducing poverty through economic growth. It also marked the beginning of a massive expansion of participatory democracy.⁶ After the collapse of the Soviet Union, many developing and transition economies were radically changing their political and economic frameworks. The spread of democracy was opening up greater space for all kinds of activism, including environmental campaigns. Though uneven and far from universal, the process provided openings for stronger voices from communities, nongovernmental groups, and individuals in Asia, Africa, and Latin America.

The Washington Consensus

Despite Rio's best efforts, in other respects the options for environmental protection were narrowing. Economic liberalization continued to sweep across the world. The IMF and the World Bank urged developing countries to reform their economies along the lines of the 'Washington Consensus' – a view of what a poor country should do to become more prosperous.⁴ The core argument was that liberalizing markets and dismantling barriers to trade and investment would cause rapid economic growth. This radical medicine might worsen social dislocation, harm cultural identity, or strain environmental resources, but it was assumed that economic growth would create enough wealth to repair the damage.

The five years after Rio seemed to confirm the validity of this approach. After the early 1990s recession there was unprecedented growth, especially in richer countries. The more advanced developing countries that had opened their economies – such as Argentina, Brazil, China, Hungary, India, Malaysia, Mexico, the Philippines, and Thailand – became major recipients of foreign direct investment. As a result, their economies were growing by 5% per year. For the first time in history, world-wide poverty numbers actually dropped, even if the sheer number of people living on less than US\$1 per day was still a daunting 1.2 billion. Meanwhile the 'non-globalizers' lagged further and further behind, with average annual growth rates of only 1.4%.

There had certainly been formal progress on the environmental front too. Many countries developed environmental policies, laws, and institutions. Most major multilateral development banks and bilateral development agencies incorporated

environmental requirements into their policies. The social dimension of development continued to lag, however, even though *Human Development Reports* from the UN Development Programme had established the importance of looking beyond a narrow fixation on economic growth as a measure of human achievement – and that all too many trends were still in the wrong direction. Unfortunately, the opportunities for promoting human development through governments were limited by rising populations, shrinking domestic budgets, and declines in international aid. Development assistance peaked in 1992 and then went into decline – by 1998 reaching levels lower in real terms than since the 1960s.⁸

With this 'retreat' of the state from direct economic or production activity, it was feared that much of the economic power has been transferred to the 60,000 or more transnational corporations.

While these companies had greater opportunities to grow, they did not appear to assume more responsibility. In reaction, a rainbow alliance of interest groups sprang up concerned with social justice, the environment, human rights, and poverty eradication.

From Rio onwards there has been a distinct change in atmosphere and a shift from confrontation to cooperation in the intergovernmental world. UN agencies started to encourage partnerships with business. Some corporations have become more proactive and now work more closely with their critics. Initiatives include codes of conduct for self-regulation and 'green' business networks (the largest of which is the World Business Council for Sustainable Development).⁹

But a groundswell of popular opinion now asserts that neither governments nor corporations can be trusted to promote sustainable development. Such distrust is also directed at international organizations, which surfaced most visibly as the protests against globalization at the 1999 World Trade Organization meeting in Seattle.

Returning to Sustainable Development

Despite this gloomy prognosis, there is better news. Parallel to the protests has come a significant wave of policy experimentation. This can be seen as a 'second coming' of sustainable development – more subtle and potentially more powerful. It relies on practical ways to harness the power of capital and markets. Examples are the Fair Trade movement, the rise of eco-labeling and green certification, and the growth in 'ethical' investment funds. Many corporations have also tried to become more responsible, forming partnerships with civil society organizations.

Among the most serious obstacles to these changes is the lack of good government. Many economists argue that trade liberalization will only lead to solid economic growth if the right institutions of governance are in place, including an independent judiciary, well-functioning banks, and a non-corrupt bureaucracy.⁹

The search is on for a new direction.^h Some see this to be human development administered by the state, while others put their faith more in 'rights-based' development that empowers individuals and groups to demand not just political but also economic and social rights and to assume responsibilities to match them.

What confronts the World Summit on Sustainable Development, to be held in Johannesburg in August–September 2002, is the very question of whether 'sustainable development' can solve the problems posed by globalization. Who should be involved in global discussions and decision-making? What is the future role of the UN and how can it operate most effectively? What are the barriers to sustainable development at local and national levels, and how can global attention help to deal with them? The summit is also a chance to move beyond vague commitments to sustainable development and demonstrate that its principles can be at the heart of international collaboration.

^aWard and Dubos (1972).

^bUNEP/WWF/IUCN (1980).

^cFisher (1993).

^dThe Washington Consensus was the name that economist John Williamson gave in 1989 to a list of 10 policy recommendations for countries willing to reform their economies. His prescriptions were fiscal discipline, redirect public expenditure, tax reform, financial liberalization, a single and competitive exchange rate, trade liberalization, eliminate barriers to foreign direct investment, privatize state-owned enterprises, deregulate market entry and competition, and secure property rights. See Williamson (1990).

^eGerman and Rande (1998).

^fUNRISD (2000) p.76.

^gAmartya Sen sets out the fundamental conditions for development investments to yield the desired results. See Sen (1999). David Dollar and Lant Pritchett have come to similar conclusions for development aid. See Dollar and Pritchett (1998).

^hSee UNDP (1997).

Maastricht Treaty, which included specific references to sustainable development. In the minerals sector, the International Council on Mining & Metals has recently adopted a Sustainable Development Charter.⁶

The overall framework of what sustainable development means and how to put it into practice still has some murky areas but is becoming increasingly coherent. The most widely accepted definition of sustainable development is the one used in 1987 by the

World Commission on Environment and Development (known as the Brundtland Commission):

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.⁷

This definition has received broad support, not least because it is a deceptively simple formulation. But it has multiple layers of meaning and some profound implications. It allows flexibility within defined boundaries, and can be applied to the development of many activities. There is no single goal or path for getting there; sustainable development presents more a framework for change than a list of prescriptions to achieve it. In this sense, it is as hard to define as other ideas that guide society – such as democracy, or justice, or freedom of speech.

The original Brundtland definition can be broken down into four conditions for sustainable development:⁸

- material and other needs for a better quality of life have to be fulfilled for people of this generation
- as equitably as possible
- while respecting ecosystem limits and
- building the basis on which future generations can meet their own needs.

A core principle of sustainable development is to improve human well-being and to sustain those improvements over time. The goal is for children to have as good a life as their parents did, or better. This requires passing the means of survival on to future generations unimpaired and building, or at least not diminishing, the total stock of capital. It also requires the integration of social, economic, environmental, and governance goals in decision-making.

Sustainable development has also brought to the fore the notion of equity in access to opportunities and in the distribution of costs and benefits. It focuses attention on righting the enormous imbalances in political and economic power – between rich and poor people; among corporations, states, and communities; between rich and poor countries.

The idea of 'capital' lies at the heart of sustainable development. This goes well beyond the common idea of financial capital and has five main forms:

- *natural capital*, which provides a continuing income of ecosystem benefits, such as biological diversity, mineral resources, and clean air and water;

- *manufactured capital*, such as machinery, buildings, and infrastructure;
- *human capital*, in the form of knowledge, skills, health, and cultural endowment;
- *social capital*, the institutions and structures that allow individuals and groups to develop collaboratively; and
- *financial capital*, the value of which is simply representative of the other forms of capital.

Some theorists of sustainable development see all these forms of capital as completely substitutable – it does not matter what form the stock of capital takes so long as the total, in some agreed unit of account, does not decline. This is the ‘soft’ view of sustainable development. While this view is consistent with all views of sustainable development in demanding that equivalent or increased amounts of capital are passed to future generations, it allows the form of this capital to change. This opens the door to passing on to the next generation less of one kind of capital so long as there is more of another to balance it. To a proponent of ‘soft’ sustainable development, natural resources do not occupy a privileged position, and the environment is merely one form of capital among others.

Others, however, argue that the different types of capital are not substitutable, since the loss of some forms of ‘critical’ natural capital – such as the ozone layer or biological diversity – could threaten the very survival of the human race. Moreover, while most manufactured and human capital can be replaced (with a few exceptions like cultural diversity), the destruction of natural capital is often irreversible within generational time frames. This approach narrows the range of options by forbidding certain trade-offs. It is the ‘hard’ view of sustainable development.

This discussion of ‘soft’ versus ‘hard’ sustainable development is not just a theoretical concern. It goes right to the heart, for example, of why some people think there should be no mining in protected areas. Some people believe that certain areas of the planet should be beyond reach for any human activity that will disturb them, including mining, because they contain irreplaceable critical natural or human capital.

There is an emerging consensus that there are in fact some ‘non-negotiable’ or non-tradable types of capital. While many agree they exist, the difficulty comes in

agreeing what they are. A fundamental problem is that denying the possibility of substitution may imply that certain forms of capital have an ‘absolute’ value, greater than any other objective or consideration. Are human rights any more negotiable than biological diversity? Where should the line be drawn? It is often difficult to reconcile this ‘hard’ concept of sustainable development with a people-centred approach.⁹

The on-going theoretical debates about sustainable development should not obscure its usefulness as a decision-making tool. Perhaps one way of understanding how to use the idea of ‘capital’ is to divide decisions into three groups:

- *‘Win-win-win’ decisions* – Some decisions advance all the goals identified by sustainable development simultaneously: they improve material well-being for this generation, spread that well-being more equitably, enhance the environment, strengthen our ability to manage problems, and pass on enhanced stocks of capital to future generations. These are obvious ‘wins’ and should be acted upon.
- *‘Trade-off’ decisions* – Other decisions will result in both gains and losses. If the gains are great enough and the losers can be compensated, the decision should be to proceed. This is the zone of trade-offs and requires an agreed mechanism for reaching a decision.
- *‘No-go’ decisions* – A final group of decisions may go past some widely accepted limit, such as destroying critical natural capital or transgressing fundamental human rights. If these conditions hold, the decision should be to not proceed.

Many of the complicated decisions that need to be made on the path towards sustainable development will involve compromises or trade-offs: between different objectives and dimensions, between different groups of stakeholders, between different generations. There may be conflicts between global and local priorities. Long-term needs will need to be balanced against short-term imperatives. The various constituencies, acting in concert, will need to evaluate the acceptability of, for example, sustaining minor environmental damage in exchange for major social and economic gain, or of sacrificing economic and social goals for a significant environmental benefit.

Different disciplines have used different language or concepts to describe the challenges described earlier.

An economist has a quite different perspective than an anthropologist or a natural scientist. Recent thinking includes work using terms such as rights-based approaches to development, sustainable livelihoods, impact analysis and life-cycle thinking, and various resource efficiency concepts. None of these alone can provide all the answers, just as no one of the sciences can do so. Each is designed for particular purposes. Although views and priorities will always differ between stakeholder groups and regions, sustainable development provides a common vocabulary for discussion and agreement on some first principles. In applying these principles, the chance of maximizing win-win-wins and minimizing trade-offs among social, environmental, economic, and governance objectives is improved through the integration of otherwise conflicting goals.

The Importance of Governance

A sustainable development framework should be defined only in part in terms of social, environmental, and economic principles. It should also be defined by the decision-making processes it promotes: the mechanisms for reaching decisions and where necessary making the trade-offs it identifies in ways that are widely regarded as fair. New principles for governance are required – these can be seen as the fourth dimension of sustainable development. Where existing institutions are not capable of applying those principles and making the trade-offs in acceptable ways, there may even be need for some new institutions.

Actors should strive to have consensus on a long-term vision, which distinguishes between long-term and short-term priorities. Effective participation by all constituents in shaping the vision is crucial to ensure acceptability and legitimacy. The adoption of strategic approaches is required to identify means of achieving this vision. This will mean adopting approaches that are based on credible evidence, set priorities, and lay out the main tactics for achieving them. It will also require defining and redefining the roles and responsibilities of different actors and the overlapping boundaries of responsibilities.¹⁰ This will have important institutional, capacity, and budget implications, making cooperation between different actors key.

Over time, many stakeholders will need to make big changes, and will naturally need to see some benefit

from doing so. If there is to be rapid progress towards sustainable development, a mix of strong, overlapping, and mutually reinforcing incentives is required. A meaningful system of independent evaluation, backed up by the ability to encourage good behaviour and discourage inadequate performance, is needed. Many, although not all, of these incentives will be market-based. Appropriate education, regulation, and policy will also be key.

Different challenges have to be addressed at different levels. Fundamental questions should be asked about the appropriate level (local to international) and value systems for decisions. Some challenges to sustainable development should be addressed at the global level (climate change), and others should be addressed at the national (regulatory changes) or local level (resource use). In each case, the principle of subsidiarity should be adhered to, which recognizes that decisions should be taken as close as possible to and with the people and communities most directly affected.

There are also financial costs associated with moving towards sustainable development. In some cases, these costs may outweigh the benefits of improvements. Though this report talks of minimizing impacts, in economic terms the aim is to reduce the impacts to the point where the additional costs of reducing these impacts would outweigh the additional benefits. Moreover, the costs of reaching the goals of sustainable development have to be apportioned in a way that ensures that economies remain sufficiently viable to meet the needs of humankind for development and for various products and services – which in turn implies that the prices paid for products must reflect the true costs of providing them. Some change will be achieved by win-win efficiency gains (such as a reduction in energy use), but much more will involve internalizing costs that have been outside the market system thus far.

Last but not least, sustainable development also requires democratic processes to ensure that people can participate in the decisions that affect their lives, as well as legal and political structures to guarantee their civil and political rights. Transparent and democratic governance confers legitimacy on development and holds organizations and corporations to account for their actions.

A Sustainable Development Framework for the Minerals Sector

Applying the concept of sustainable development to the minerals sector does not mean making one mine after another ‘sustainable’ – whatever that means. The challenge of the sustainable development framework is to see that the minerals sector as a whole contributes to human welfare and well-being today without reducing the potential for future generations to do the same. Thus the approach has to be both comprehensive – taking into account the whole minerals system – and forward-looking, setting out long-term as well as short-term objectives. Moving from the concept of sustainable development to action requires:

- a robust framework based on an agreed set of broad principles;
- an understanding of the key challenges and constraints facing the sector at different levels and in different regions and the actions needed to meet or overcome them, along with the respective roles and responsibilities of actors in the sector;
- a process for responding to these challenges that respects the rights and interests of all those involved, is able to set priorities, and ensures that action is taken at the appropriate level
- an integrated set of institutions and policy instruments to ensure minimum standards of compliance as well as responsible voluntary actions; and
- verifiable measures to evaluate progress and foster consistent improvement.

If the minerals sector is to contribute positively to sustainable development, it needs to demonstrate continuous improvement of its social, economic, and environmental contribution, with new and evolving governance systems. The sector needs a framework within which it should judge and pursue any development.

Table 1.1 provides a set of guiding principles for each of the four dimensions of sustainable development. These principles should be seen as high-level aspirations that could equally be applied to other parts of the economy. They should be interpreted in a way that recognizes diversity, the limits of existing levels of knowledge and capacity, and society’s continuing need for minerals. Under the guiding framework of these principles, goals and priorities should be agreed at the appropriate level (from local to global), as should the strategic approaches for achieving them.

Table 1–1. Sustainable Development Principles

Economic Sphere

- Maximize human well-being.
- Ensure efficient use of all resources, natural and otherwise, by maximizing rents.
- Seek to identify and internalize environmental and social costs.
- Maintain and enhance the conditions for viable enterprise.

Social Sphere

- Ensure a fair distribution of the costs and benefits of development for all those alive today.
- Respect and reinforce the fundamental rights of human beings, including civil and political liberties, cultural autonomy, social and economic freedoms, and personal security.
- Seek to sustain improvements over time; ensure that depletion of natural resources will not deprive future generations through replacement with other forms of capital.

Environmental Sphere

- Promote responsible stewardship of natural resources and the environment, including remediation for past damage.
- Minimize waste and environmental damage along the whole of the supply chain.
- Exercise prudence where impacts are unknown or uncertain.
- Operate within ecological limits and protect critical natural capital.

Governance Sphere

- Support representative democracy, including participatory decision-making.
- Encourage free enterprise within a system of clear and fair rules and incentives.
- Avoid excessive concentration of power through appropriate checks and balances.
- Ensure transparency through providing all stakeholders with access to relevant and accurate information.
- Ensure accountability for decisions and actions, which are based on comprehensive and reliable analysis.
- Encourage cooperation in order to build trust and shared goals and values.
- Ensure that decisions are made at the appropriate level, adhering to the principle of subsidiarity where possible.

Although laid out in different spheres here for ease of interpretation, these principles should be applied in an integrated manner in decision-making. Thus, for example, the role of mineral wealth in maximizing human well-being should be encouraged, but it must be undertaken in a way that protects the environment and other social and cultural values. Similarly, the

decision of whether or not to mine in a certain area should be undertaken through a democratic decision-making process and be based on an integrated assessment of ecological, environmental, economic, and social impacts.

Key Areas of Action and Challenges

Some progress has already been made by various actors in the minerals sector towards the goals of sustainable development, but a great deal remains to be done.

Through a consultative process (see Introduction), the MMSD Project focused stakeholders' concerns into nine key challenges facing the sector:

- the viability of the industry;
- control, use, and management of land;
- national economic and social development;
- community development;
- environmental management;
- the use of minerals;
- information flow;
- artisanal and small-scale mining; and
- roles and responsibilities.

These nine challenges are put forward to reflect the most pressing issues facing the industry, which MMSD identified in its consultations with different stakeholders. They are not definitions of what sustainable development means in the minerals sector. This report represents an attempt to apply the overarching sustainable development principles outlined in Table 1.1 to these challenges in order to demonstrate how the sector can best contribute to sustainable development.

This section examines how the goals and principles of sustainable development apply in each challenge area. The points made here have emerged from the MMSD process but should not be taken as a consensus list. It is intended as a draft 'wish list' rather than as something that can be achieved immediately.

Viability of the Minerals Industry

The minerals industry has a key role to play in assisting the sector to make a substantial positive contribution to sustainable development. Important changes will take place, and the ultimate shape of the industry cannot be known with any certainty. But two challenges are clear.

- The global market for minerals must develop in a way that enables rather than constrains the transition to sustainable development, notably in terms of internalizing costs over time, while maintaining viable enterprises and rewarding good practice. Creating incentives for industry through market-based solutions must go hand in hand with enforcing standards and guidelines.
- The fundamentals of sustainable development must become embedded in the culture of mining companies. If this can be done successfully, it will have significant and cumulative effects on a whole range of aspects of company life – from the health and safety of workers and the communities they operate in to long-term skills training.

The Control, Use, and Management of Land

The development of minerals unavoidably competes with other land uses. Uncertainty over the ability to obtain access to land for mineral exploration and development imposes serious constraints on industry. At the same time, many other actors – including local communities and indigenous peoples – have vital interests in how land is used and who makes decisions regarding land use.

- Land use decisions should be arrived at through a process that respects the principle of prior informed consent arrived at through democratic decision-making processes that account for the rights and interests of communities and other stakeholders, while still allowing for the negotiated use of renewable and non-renewable resources. This should equally apply to negotiations for access to land used by people whose rights to that land are not formally recognized by the state or who do not have the capacity to defend those rights.
- The decision of whether or not to explore and mine in a certain area must be based on an integrated assessment of ecological, environmental, economic, and social impacts and thus be governed by a land use strategy that incorporates the principles of sustainable development.
- Decision-making processes must be open to the decision not to mine in circumstances where cultural, environmental, or other factors override access to minerals or where mining would impose unacceptable loss in the view of those it is being imposed on.
- There must be compensation for any harm that occurs as a result of land use decisions.

National Economic and Social Development

The potential for mining to bring economic and social development, particularly to developing countries, should be harnessed. Mining should bring benefits that can be sustained at the national level even after mining ceases. Potential benefits are by no means automatic, however. Any country that wishes to translate mineral wealth in the ground into human development for its people faces stiff challenges.

- Creating and sustaining mineral wealth can play an important role in maximizing human well-being, but it must be undertaken in a way that protects environmental quality and other social and cultural values while recognizing the sovereign rights of governments to act in the best interest of the nation.
- Economic efficiency of mineral production should be achieved such that the marginal benefits and costs to society are equalized.
- A portion of the rents derived from minerals and other non-renewable resources needs to be set aside and re-invested, in order to ensure a sustainable income when the resource is used up. This may include investing in financial assets or physical and human resources.
- Revenues should be shared equitably between the public and private sectors and among central, regional, and local levels. Decisions on how the surpluses are distributed should be arrived at through democratic decision-making processes.
- Revenue management – which pertains to how these rents are used by the public sector to support development at national and, increasingly, at regional and local levels – will require a sound macro-economic framework of pro-poor policies and transparent public expenditure management, as well as adequate capacity on the part of government to manage project-generated revenues.

Community Development

Best use should also be made of the potential for mining to contribute to sustainable development at the local level. The challenge at the community level, as elsewhere, is to maximize the benefits and to avoid or mitigate any negative impacts of mining.

- Priorities and ultimately choices regarding trade-offs relating to different social, environmental, and economic goals need to be determined through participatory processes, involving all relevant actors,

including members of the affected community, and in accord with the local context. This requires appropriate processes for participation and dialogue, as well as adequate capacity and access to information for all involved. Potentially disadvantaged groups, such as women, indigenous peoples, and minorities, should be included.

- The relationship between the mining company and other actors needs to be one of collaboration, trust, and respect.
- The goal should be that no one be made worse off, although it is inevitable that there will be losers in both the absolute and the relative sense.
- Priority should be given to ensuring that the rights of marginalized individuals and groups in communities are protected and that they receive a fair share of the benefits.
- The economic benefits brought by mining should be shared equitably within communities.
- To ensure that benefits are sustained, a proportion of the rents should be invested in other forms of capital, such as trust funds, skills training, or social infrastructure.
- Mining should not leave unacceptable environmental or other negative legacies.
- Where it does not already exist, sufficient capacity should be developed at the local level to manage revenues for legitimate development needs. Public-private partnerships should be encouraged.

Environmental Management

There is a considerable degree of environmental impact associated with most exploration, mining, and mineral processing, and negative impacts can be spread over large areas. Though ideally the minerals sector should not operate at the expense of the environment, in practice there is a balance to be struck if the decision to proceed with an operation is made. The challenge becomes how to optimize the trade-off between environmental damage and the potential development benefits to local and national economies.

- The negative effects of minerals and metal products on the environment and human health should be minimized through all phases of the minerals life cycle.
- Long-term damage should be avoided. No permit should be sought on the basis of a trade-off today against long-term and irreparable legacies that may harm future generations. Prudence should be exercised where the environmental impacts or

damage are not known.

- Best-practice appropriate technologies and modern management techniques should be adopted, and research and technological innovation accelerated, to produce the smallest possible environmental footprint while not entailing excessive cost. This can be achieved through improved resource and energy efficiency as well as cleaner technologies.
- Minerals and metals themselves can play a crucial role in minimizing negative environmental impacts, as they are important components of pollution prevention and cleaner production technologies.
- Consistent with the need to internalize costs, polluters should pay for clean-up, remediation, and prevention. Where no owner can be located, mechanisms to set priorities and deal with the legacy of liabilities must be developed.
- Mine closure and, more important, post-closure should be planned for. This should ensure that the land and structures can be restored for alternative uses after the mine closes.
- By paying much closer attention to the potential to restore and replenish natural ecosystems, the minerals sector can play a part in maintaining the diversity of plant and animal species on which the survival of the planet depends.

An Integrated Approach to Minerals Use

The use of minerals is essential for modern living – for meeting basic requirements and the aspirations for improved welfare for current and future generations. Yet current patterns of use face a growing number of challenges, ranging from concerns about efficiency and waste minimization to the risks associated with the use of certain minerals. Added to this is the call for more equitable shares in mineral use world-wide.

- The basic needs of individuals and communities for mineral products should be met. Clearly, this requires sufficient income and the availability of minerals.
- Effort should be made to attain a more equitable distribution of use between industrial and developing countries.
- While recognizing the essential need for minerals, efficient use should be encouraged to reduce waste, depletion, and pollution. Remanufacture, re-use, and recycling should be encouraged. The social and economic impacts associated with these changes must be assessed and responded to.

- Life-cycle thinking should be used as a decision-making tool to assess production processes, mineral uses, and the impacts and alternative materials choice. Where the risks associated with certain end-uses are unknown, prudence should be exercised.
- Responsible stewardship of minerals should be promoted throughout the life cycle.
- Minerals and metals consumers, many of whom are large equipment manufacturers and contractors, must increasingly be prepared to give preference and potentially pay more to minerals producers who behave in a responsible manner. Ultimately, end-use consumers must be prepared to pay the full internalized costs of metals and minerals production.
- Best use of mineral products and metals should be made in facilitating development through their input to physical infrastructure and other applications.
- In its use of non-renewable resources, the present generation needs to consider the needs of future societies.

The Flow of Information

Sustainable development requires increased openness and greater transparency in information production and dissemination throughout the minerals life cycle. The processes by which information is generated and communicated play a key role in building or undermining trust and in improving all players' ability to negotiate effectively.

- Authoritative, independent sources are critical to ensure that information is trusted and to respect the right of stakeholders to have access to accurate and relevant data.

Photograph not shown

- Access to information is linked to the ability of individuals to secure and defend fundamental rights to resources. Information must be collected and distributed in an equitable manner to ensure this.
- Systems of accountability and verification are essential to monitor the performance of companies, governments, and civil society.
- Knowledge needs to be shared and gaps progressively filled.

Artisanal and Small-scale Mining

Artisanal and small-scale mining (ASM) activities can play a crucial role in providing sources of income in poor areas. The sector is better known, however, for its high environmental costs and poor health and safety record. Irrespective of whether it is a net contributor to sustainable development, the fact remains that ASM activities will persist for at least as long as poverty continues to make them attractive.

- ASM's contribution to poverty alleviation and local economic development must be optimized by investing a proportion of the revenue generated in other forms of capital, such as education and alternative income-producing opportunities, and through ensuring that ASM activities are incorporated into broader local development planning.
- The negative environmental and social impacts of small-scale mining as well as adverse impacts on human health should be avoided or reduced.
- Where applicable or feasible, alternative economic activities more appropriate for working towards sustainable development should be sought.
- The collective capacity of artisanal and small-scale miners should be developed to enable them to better contribute to sustainable development.
- The development of 'fair trade' markets for artisanal and small-scale mining products should be encouraged to ensure that producers get a fair return and that they adhere to the practices of sustainable development.

Roles, Responsibilities, and Instruments for Change

Accompanying the rights of different groups are corresponding responsibilities to safeguard the interests of others. The boundaries of responsibility and what is considered good behaviour have to be agreed upon and respected if progress is to be made. These will be

led by the best practice of the day, but may well change as knowledge improves.

- Participatory and democratic decision-making structures should be adhered to.
- Decisions should be decentralized and taken as close as possible to the stakeholders most directly affected.
- No one component of the minerals sector alone can drive the evolution in thinking and practice that is required; coordinated action is necessary. This also requires the development of trust.
- All actors need to develop the institutional culture, resources, and skills required for the transition to sustainable development.
- Decision-making and dispute resolution need to take place in ways that treat people with equal concern and respect and that recognize their unequal power relationships and vulnerabilities.
- Alliances will need to be constructed between the private sector, the public sector, civil society, and external development assistance partners to manage many of the dimensions of sustainable development. In turn, this will require agreement on mutually agreed objectives, shared responsibilities for outcomes, distinct accountabilities, and reciprocal obligations.

The Challenge of Implementation

One of the key challenges for the minerals sector is implementation. In this it is not alone – as the 10 years since Rio have demonstrated, achieving the goals and objectives of sustainable development presents tremendous challenges for all parts of society.

Various instruments are available to facilitate putting sustainable development into practice. Some of these are well known; others are in experimental stages. (See Box 1–2.) These are discussed further in Chapter 14. Policy-makers will need to select a mixture of these, based on the principles outlined in the sustainable development framework described earlier.

For the minerals sector, implementation requires the development and refining of integrated tools from the international to the local level and at all stages. Some of these are already available and in use, such as impact assessments of mining operations (whether social, environmental, or conflict impacts), life-cycle thinking and analysis, and planning for mine closure, but they

Box 1–2. Instruments of Change

Legislative, regulatory, and juridical instruments include constitutional guarantees on sustainable development and its elements, as well as laws, by-laws, and regulations that set standards governing ownership, production, consumption, trade, environmental liability, associations, and contracts. Numerous national and international agreements govern social, environmental, and economic behaviour. Legal instruments can set absolute limits and provide clear sanctions, especially in areas with clear consensus. However, they can quickly become outdated in relation to society's rapidly changing aspirations, scientific discovery, technology, and economic conditions. The 'mandate, regulate, and litigate' approach can also be costly to implement in several ways – in direct financial terms, in its blindness to differences in the cost of compliance, in the hostilities it produces, in locking in outmoded or irrelevant technologies, and in the innovation that it may stifle. In addition, regulation can be 'captured' to serve the interests of powerful or narrow interest groups. Finally, public-sector capacity to enforce legal instruments may be weak.

Financial and market instruments include:

- *property rights-based approaches*, including tradable pollution permits or other licences, concessions, and liability claims for environmental damages;
- *price-based approaches*, including pollution or disposal taxes, payments for environmental amenities, auctions of publicly owned resources, user fees, tax credits for socially responsible investment funds, and performance bonds;
- *reform of perverse subsidies* to encourage more efficient use of resources; and
- *market-enabling measures*, including information disclosure requirements, product certification and labelling, and procurement policies.

These various instruments work by influencing behaviour through price signals. Their advantages centre on their ability to benefit from competition and efficiency in the market. They can produce a desired outcome at much lower cost than regulation by encouraging innovation and continuous improvement, by finding solutions suitable for the local situation, and by reducing enforcement and administration costs. However, considerable capacity is needed to develop and implement these instruments and they should not be introduced without careful preparation and negotiation, as they may lead to severe economic dislocation. In addition, imposing charges for previously 'free' use of natural resources may not be politically feasible or even desirable for poor groups that are significantly affected.

In the category of *educational and informational instruments* are accessible information on resources, stakeholders and their performances, sustainable development challenges, and opportunities to improve performance; research and pilot projects, especially where stakeholders are themselves involved; and demonstration projects. Also included in this category are public awareness campaigns. The advantage of educational instruments is the ability to raise awareness, encourage self-regulation, and bring about positive peer pressure. They can also reinforce other instruments by improving understanding of the latter's rationale and benefits.

Voluntary instruments tend to rely on self-interest and the innovation that can be found in multistakeholder approaches. There are real limits to what can be achieved through voluntary approaches, partly because real change in behaviour may be less evident than rhetoric implies (especially in the absence of 'sticks and carrots'). In addition, these efforts can actually be so successful that government is left behind, producing a climate of neglect by the state in which weaker groups may become more vulnerable. Included in this category are fora and facilities for dialogue; partnerships (public-private) and associations (corporate or mixed); environmental management systems; full privatization of resources, rights, and services to companies or communities; decentralization of rights and responsibilities; codes of conduct by individual corporations and associations; citizens' actions; contracts and agreements on access, management, and service provision; and common property management regimes.

Source: Dalal-Clayton and Bass (2001) pp.22–24.

may need to be improved. Tools that need to be developed include reliable and accessible measures of sustainable development plus methods for assessing trade-offs and balancing conflicting interests. These and other tools are discussed throughout Part III.

Putting sustainable development into practice also requires actors in the minerals sector to be publicly committed to explicit and well-understood goals and objectives. Leadership from the top is a must, as is the need to ensure that all employees understand what sustainable development entails. This is necessary not only for companies but also for government ministries and departments at all levels, as well as labour, civil society organizations, and communities. Capacity building is also key to moving forward.

Conclusion

The concept of sustainable development is not new – it brings together ideas from a long history of human development into one common framework. This is becoming an increasingly important guide and judge for many actors – whether from government, industry, or civil society. There is little disagreement about the broad principles contained in the framework, although different groups and individuals accord different priorities to the various spheres – economic, environmental, social, and governance – depending on their interests and their level of understanding and implementation. These priorities will determine the paths of action for implementation of the principles. The differences do not detract from the high level vision of sustainable development, which allows for different iterative and ever-improving approaches.

Because there is no one way – no magic bullet – all that this report can do is to propose a set of sustainable development principles and to test and test again all the activities along the minerals supply chain to see how they stand up to the principles and ideas in the sustainable development lexicon. Equally important is understanding how these activities should change for the better, and how such change can be implemented. Chapter 16, the Agenda for Change, reflects four criteria that have to be applied. Any suggested actions have to be:

- consistent with the sustainable development framework;
- based on clearly defined objectives and incentives to change towards better practice;
- SMART – specific, monitorable, achievable, realistic, and time-bound;
- moving towards higher levels of trust and cooperation; and,
- where possible, built on existing structures and institutions.

In many ways the picture today is already more positive than it was a decade ago. Concerns about the social and environmental effects of minerals development and disparities in the distribution of costs and benefits are still very real. There remains much to be done in improving the sector's contribution to all aspects of sustainable development. But the largest companies and their newest operations at least are now being held to higher standards. Indeed, the best mining

operations are now in the sustainable development vanguard – not merely ahead of what local regulations demand, but achieving higher social and environmental standards than many other industrial enterprises. Similarly, many governmental and other players are continually raising the bar. This report is designed to see that these trends continue, that the best performers continue to improve, and that the standards of poor performers are raised.

Endnotes

¹ Throughout this report, the term minerals sector is used to describe all the key stakeholders associated with the sector: government, industry, international organizations, non-governmental organizations, civil society, communities, and labour.

² World Bank (2000b).

³ World Bank – International Finance Corporation (2002).

⁴ Cited in Dalal-Clayton and Bass (2001) Chapter 7, p.4.

⁵ Agreement signed in April 1994. See <http://wto.org>.

⁶ ICMM SD Charter can be found at http://www.icmm.com/html/charter_intro.php.

⁷ World Commission on Environment and Development (1987) p.43.

⁸ See Secrett (1995) for an example of sustainable development broken down into concrete ideas, p.7.

⁹ Dalal-Clayton and Bass (2001) Chapter 8, p.14.

¹⁰ Ibid., Chapter 2, p.21.