



Mining, Minerals and  
Sustainable Development

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# Executive Summary

## Mining, Minerals and Sustainable Development Project Draft Report for Comment



International  
Institute for  
Environment and  
Development



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## Part I: A Framework for Change

**The Context.** Mineral products are essential to modern living and to the fulfilment of basic needs. Mining can also play a key role in poverty alleviation and broader economic development. However, concerns about the sector prevail. Mining, refining, recycling and the dispersal of minerals have in some instances led to significant local environmental and social damages. It is not always clear that mining brings economic and social benefits to the host countries either, and the minerals sector sometimes operates where there is poor governance, including corruption, and is thus associated with it.

In the past decade, the mining and minerals industry, like other parts of the corporate world, has come under tremendous political pressure from various groups to improve its social, economic, and environmental performance, and its transparency. In response, a number of companies, independently or with others, have begun to establish ‘voluntary standards’ that often go beyond what law requires. Some observers however are suspect that many businesses are actually engaging in little more than public relations exercises. In particular, some of the stakeholders in the minerals sector question the industry’s ‘social licence to operate’ in many areas of the world.

Against this background, and with the World Summit for Sustainable Development to be held in Johannesburg in 2002 in mind, nine of the world’s largest mining companies decided to initiate a project to examine the role of the minerals sector in contributing to sustainable development. Through the World Business Council for Sustainable Development, they contracted the International Institute for Environment and Development to undertake a scoping study and subsequently in April 2000, a two-year independent process of research and consultation – the Mining, Minerals and Sustainable

Development Project (MMSD). MMSD – ultimately attracting sponsorship from over 40 commercial and non-commercial organizations – had the following broad objectives:

- to assess the potential contribution of the global mining and minerals sector in the transition to sustainable development;
- to identify how the services provided through the minerals supply chain can be delivered in ways that support sustainable development; and
- to build platforms of analysis and engagement for ongoing communication and networking among all stakeholders in the sector.

MMSD was conducted under the principle that those with an interest in the sector (that is, the industry and all other actors involved or affected by it including governments, labour and civil society) should have the opportunity to put forward their views.

A project on mining and minerals was bound to be controversial and complex. The lack of trust among interest groups made it clear from the outset that it would take a long time to build the needed dialogue. All the barriers to progress could not be overcome in two years, nor could the project realistically explore every concern. MMSD would attempt to initiate the process with the expectation that much would remain to be done.

That has proved to be the case. In some regions and with some stakeholders, there has been considerable engagement and a useful exchange of ideas. In other places and with other actors, there has been little or no engagement or even outright rejection to engage. The industry itself is diverse and heterogeneous, and the involvement of different companies in the project varied considerably. There is a significant ‘disconnect’ in the supply chain of minerals, which caused the involvement of actors along the chain to be difficult to achieve.

At the global and regional levels, processes were established to surface and research issues related to minerals production and use and sustainable development, and to set up a process of engagement for interested parties. Four MMSD regional partnerships were established in places where mining and minerals issues are prominent – in Australia, North America, South America, and Southern Africa. In addition, regional meetings were held and research undertaken in Europe, Russia, and Southeast Asia. Research was also undertaken in China, India, and West Africa.

At the global level, the project’s scope was condensed down to a series of challenges: the viability of the industry; control, use, and management of land; national economic and social development; community development; environmental management; the use of minerals; access to information; artisanal and small-scale mining; and roles, responsibilities and instruments for change. Workshops were held and research commissioned around these challenges.

The project was supervised by an independent Assurance Group of 25 experienced individuals from different stakeholder groups and regions. The group met seven times to review progress and advise on future direction. The project management maintained independence throughout the process. Regional processes also had their own autonomous, though similar in principle, governance structures.

## ***The Minerals Sector and Sustainable Development***

Sustainable development is an emerging framework. It involves an integrative approach to human development – considering social, economic, environmental and governance objectives together. Decision-making processes are as vital as the end results and may entail making choices and trade-offs between competing interests.

The challenge of the sustainable development framework is to see that the minerals sector as a whole contributes to the welfare and well-being of the current generation, without reducing the potential for future generations to do the same. Thus the approach has to be both comprehensive and forward-looking. 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.

Moving from this concept 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 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.

Table 1 provides a set of principles for each of the four dimensions of sustainable development. These should be seen as high-level aspirations and be interpreted in a way that recognizes diversity, limitations in knowledge and capacity, and society's need for minerals.

**Table 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, and social and economic freedoms.
- Seek to sustain improvements over time. Ensure that depletion of natural resources will not deprive future generations through replacement with other forms of capital.
- Protect minority rights.

**Environmental Sphere**

- Promote responsible stewardship of natural resources and the environment.
- 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.
- 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.
- Adhere to the principle of subsidiarity, which recognizes that decisions should be decentralized and taken as close as possible to and with the people and communities most directly affected.

**The Challenge of Implementation.** Steps have already been made to improve the sector’s contribution to sustainable development. However, a great deal remains to be done. Progress requires actors to be publicly committed to the principles of sustainable development. Leadership from the top is a must for companies, government ministries, civil society organizations, and communities, as is the need to encourage commitment throughout the organization. This will require defining the roles of different actors and ensuring sufficient capacity to fulfil these.

One of the key challenges is the development of integrated tools, capable of bringing these diverse principles and objectives into focus in a manageable decision-making framework. A wide range of instruments is available including regulatory, financial, educational, and institutional. Instruments need to be effective and innovative; administratively feasible; cost-efficient, with incentives for innovation and improvement; transparent; acceptable and

credible to stakeholders; reliable and reproducible across different groups and regions; and equitable in the distribution of costs and benefits.

Any suggested actions have to be:

- consistent with the sustainable development framework;
- based on best practice 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.

## **Part II: Current Trends and Actors**

In the global economy, the minerals sector is relatively small. Its total market capitalization is lower than a number of individual companies such as Microsoft or General Electric. The sector is also very diverse. There are at least 80 mineral commodities and seven principal classes of minerals: base metals, ferrous metals, precious metals, minor metals, energy minerals, construction minerals, and diamonds and precious gems. Some metals have been in use for thousands of years and others only more recently. In the past, minerals were most commonly produced from deposits in or near to the region in which they were consumed, whereas today, trade in minerals is more globalized. MMSD focused largely on globally traded minerals.

An estimated 30 million people are involved in large-scale mining, representing 1% of the world's workforce. Employment in mining is decreasing as automation increases and mines in industrial countries are closed. A further 13 million are estimated to be involved in small-scale mining. Including dependents, the number of people relying on mining is likely to be about 300 million. It is estimated that a further 1 million workers are employed in the ferrous and non-ferrous metals recycling industries. Many other people are directly or indirectly employed in the rest of the minerals life cycle.

Mineral production is an important economic activity in many parts of the world. In 34 countries, minerals account for at least 25% of merchandise exports. These countries are diverse in their geographic location and their level of development and governance. Production is increasingly concentrated in developing countries. Historically, Europe, Japan, and the US have been the largest mineral-consuming and importing regions, though much of their imports are converted into metals products and re-exported. Increasingly, other markets are maturing.

Over the last centuries, the real price of some mineral commodities has declined, while others have remained relatively stable. This decline is a function of changing technologies, physical availability, and demand. Moreover, the minerals industry exhibits volatile returns and has not been performing well in recent years. The complexity of issues relating to the availability of minerals and extraction technology means that the past is no sure guide to the future.

The minerals sector comprises many actors. These include:

***The Industry*** – Large multinational mining companies dominate the market in terms of production levels. State-owned companies remain important but many have been privatized in the past decades. Smaller and medium-scale companies are also important, especially in exploration. Artisanal and small-scale mining is important for some minerals.

***Workers and Labour Unions*** –A number of national and global labour unions are active in the minerals sector. They have many functions including: monitoring and overseeing industry practices on issues such as equal opportunities, and health and safety; and participating in developing global policies to promote sustainable development.

***Governments*** –National governments have the key responsibilities of creating a framework of rules in the minerals industry operates including defining tax and royalty regimes, upholding environmental standards, granting licences and permits, planning for regional or local development, protecting the rights of affected communities, and investing and distributing revenues from minerals development. Local governments have an increasingly important role to play in implementing laws and regulations and distributing mineral wealth at the local level.

***Inter-governmental or multilateral institutions*** – Inter-governmental institutions working with the minerals sector, including the World Bank and several different UN agencies, each have specific roles and varying capacities. Their roles include capacity-building, convening forums for discussions, and developing voluntary standards of best practice.

***Civil society organizations and NGOs*** – There is a wide array of civil society organizations of different sizes and functions with an interest in the minerals sector – NGOs, community-based organizations, faith-based groups and others. They operate from the global to the local level and have many different functions including development-related work, activities in partnership with industry to improve best practice, and campaigning for specific issues.

***Local Communities*** – There are many types of communities affected by the minerals sector. For example, communities affected by mining may include those neighbouring mine sites and those which are home to migrant workers. Communities may be affected by the sector positively (for example through employment or the provision of services), or negatively (for example through having to relocate).

***Financial Institutions*** – Commercial banks are the main providers of project and corporate financing in the minerals sector. International financial institutions, like the World Bank and the regional development banks, provide additional funds. Many commercial banks expect companies to adhere to the World Bank guidelines, and to adopt a proactive approach to reducing risk. Equity investors and insurers have similar concerns.

***Consumers*** – Consumers of mineral products include manufacturing companies of different sizes, service industries, and governments (through their purchase of goods), as

well as private individuals. At present the most influential consumers of minerals are large manufacturing of metals-intensive products.

### ***Need and Availability***

Society today is highly dependent on the use of minerals for energy generation and transmission, mobility and transportation, information and communication, food supply, health delivery, and a myriad other services. Minerals use and production is also essential in terms of livelihoods and economic development through employment and income generation.

The demand for mineral commodities is likely to rise with increases in population and real per capita income. This may be partially offset by increases in the efficiency of mineral use due to new technologies, by improved stewardship of minerals in use, and by substitution of other materials.

A balance has to be achieved between expanding minerals consumption in developing countries to meet growing populations' basic needs, and expanding everyone's consumption to match current levels in industrial countries. Ecologically, the latter may be globally unsustainable.

Most primary mineral resources cannot be considered renewable on any time scale of relevance to the human race. Assessment of the long-term availability of mineral commodities has divided opinion for more than 30 years. In the past century, use has not resulted in a global scarcity of minerals. However, even if known mineral availability has increased in the past, this does not guarantee its continuation into the future.

Factors such as technological advancements, changes in the levels of recycling and re-use, and the rate of global economic growth will affect mineral supply and demand. Various social and environmental factors may also place limits on the long-run availability of minerals from primary sources. These include the energy required to extract material from increasingly low-grade ores and societal viewpoints of the acceptability of the impacts of mineral production. In the next half-century, the world is unlikely to face shortages of commercially important mineral commodities at a global level.

## Part III: Challenges

### ***Viability of the Minerals Industry***

***The Business Case.*** The greatest challenge to embedding sustainable development in minerals companies is the difficulty of linking the concept to financial success. Most companies are struggling to demonstrate a clear business case for pursuing sustainable development goals. Yet the business case for addressing sustainable development concerns includes numerous benefits:

- *Lower labour costs and more innovative solutions*— Providing good working conditions can improve motivation and productivity, result in fewer union disputes, and lower labour absenteeism or turnover.
- *Lower health costs* – A healthy environment for workers and the community improves well-being, which translates into higher productivity, reduced worker and community compensation and damage suits, and reduced costs for social services and medication.
- *Cost savings due to cleaner production methods and innovation* – Reducing raw materials use and increasing recycling and recovery can lower production costs. Innovation and technology can introduce new process and product efficiencies.
- *Easy access to lenders, insurers, preferential loans and insurance rates*— Lower risks achieved through implementation of a sustainable development strategy may mean lower loan rates or insurance costs.
- *Lower transaction costs*—Increased transparency and dissemination of information on a project will build trust among stakeholders and reduce transaction costs. Thorough impact assessments and baseline studies may be useful evidence in case of future liability.
- *Lower closure and post-closure costs* – Developing and implementing a clear integrated plan for mine closure can reduce associated financial costs, reduce uncertainties, and enable the company more accurately to predict and control terminal liabilities.
- *Higher value for goodwill on the balance sheet* – A commitment to sustainable development may enhance a company's profile and reputation. It will help to attract the best people to join the company. Externally, it could improve its social licence to operate.
- *Best practice influence on regulation* – Companies that follow best practice are much better placed than their competitors to influence how standards are set and the direction of regulatory change.
- *Market advantage* – Some mineral companies are moving towards integrated management of product chains. This may allow them to build deeper relationships with customers and to capture more value by adding some service elements.
- *Ethical investors* – The rapid expansion of the ethical and socially responsible investment (SRI) movement poses a new challenge for minerals companies as investors screen out stocks associated with unacceptable social and environmental performance.

Some companies are undertaking specific measures to integrate the principles of sustainable development into corporate practice, but most are far from developing a detailed vision.

Several tools are commonly used, including corporate strategy, change management programmes, formal risk management procedures, implementing and auditing internal objectives and targets, project appraisals, and core staff training programmes.

Most stakeholders appreciate the progress that some companies have made, but there are concerns about the continuation of ‘double standards’ between industrial and developing-country operations – as well as about the continuing recalcitrance of some companies. One way of reaching beyond this is through collective action, and the range and number of industry initiatives undertaken both nationally and globally has grown recently.

Many of the large international publicly quoted mining and mineral companies state that they are committed to shareholder value. A properly implemented switch from the cost culture to the value culture can potentially ensure that sustainable development issues are factored into business decision-making on a more disciplined and systematic basis. In practice, certain issues and problems remain. While the value culture may be embraced by the corporate centre, it may not be widespread within the organization nor be affecting decisions on the ground. Innovation and better practice at the local level is sometimes stifled by heavy top-down management. The change in management culture in industry is also far from universal.

**Financial Institutions.** One of the arguments in making the business case for sustainable development is that improved performance will result in lower risks for the financial institutions that provide debt and equity funding as well as insurance to the industry. If these institutions were able to recognize good environmental and social performance, they would be able to reward companies with lower costs of capital and insurance premiums. Thus the financial institutions are potentially an important leverage point.

A common set of sustainable development standards and criteria for finance decisions needs to be developed in an open process and accepted and applied by the World Bank Group, export credit agencies, regional development banks, commercial lenders, insurers, equity investors, and other financial institutions. These must be linked to factors of risk and return that are relevant to these institutions. There is a need for cross-sectoral learning of financing best practice from other capital-intensive sectors, such as oil and gas or pulp and paper.

**Employees.** Attracting high-calibre employees is essential to the industry’s continued viability and to its ability to contribute to sustainable development. Large mining companies will find it difficult to attract high-calibre people if the industry is seen as offering poor future job prospects, a negative image, and constant moves and disruption of family life. In addition, the industry has often done a less than optimal job to date of diversifying its work force, particularly in professional jobs.

Mining has a poor historical record of safe and healthy working conditions. There has been significant progress in recent years, but more needs to be done to ensure that miners can work without injury or illness. Effective safety management on a day-to-day basis requires partnership among management, workers, and unions. Companies need to demonstrate that they are meeting the minimal standards required under International Labour Organization (ILO) core conventions, including the right of workers to choose to form trade unions and the observation of minimum standards for health and safety.

Good progress has been made towards uniformity in accident reporting systems. But there is no uniform reporting system for occupational disease in the mining sector. Benchmarking is needed to encourage best practice and to determine occupational exposure limits. A common set of standards should be developed through a multistakeholder process convened by an international organization such as the ILO.

The approach to health should not be solely concerned with reducing injury and illness but should embrace a positive concept of well-being. Community health and worker health are intimately related – disease can spread quickly from and to the workplace. Consequently the sector needs to be ahead and start researching the effects of trends in employment patterns before the effects are felt.

To meet the sustainable development imperative, companies need to go beyond their traditional responsibilities to employees, shareholders, and regulators. A move towards sustainable development involves meaningful partnerships with local communities and government, effective and productive ways of working with NGOs, enhanced stakeholder participation, integrated life-cycle planning, transparency, forward-looking preventive action, timely remedial action, regulatory compliance, a respect for declared ‘no-go areas’, and investment in the future to provide for well-being in a more sustainable world.

### ***The Control, Use, and Management of Land***

Mines, smelters, and refineries occupy less than 1% of Earth’s land surface – much less than forestry or agriculture. But mines can only be located where there are mineral deposits, and this often brings conflict with other land uses and users and various ecological, environmental, economic, and social objectives.

There must be a balance: in certain circumstances, those affected by mining should have the right to say ‘no’ to a mine development where cultural, environmental, or other factors override access to minerals, or where mining would impose unacceptable loss in the view of those upon whom it is being imposed. But that decision needs to be made in a clear and transparent system, in a democratic way, with rules understood by all the parties involved. Where indigenous peoples are concerned decision making processes appropriate to their cultural circumstances must be respected. There are divergent opinions about the ways in which the concept of prior informed consent arrived at by culturally appropriate means can be effectively operationalised.

If there is to be investment in exploration and mining, there must be security of tenure. Where this means that other land users lose their rights, those rights must be compensated. Compensation systems must consider not only the rights of legal owners in the formal economy, but the needs of the millions of people in the informal or subsistence economy.

Mechanisms for compensating the loss of land need to create sustainable benefits. This principle is embedded in the World Bank Guidelines. Remuneration for loss of land use, access, or amenities, for farming terrain, or for waterways does not make the communities or individuals long-term beneficiaries or material stakeholders in the mining project.

**Land, Mining, and Indigenous Peoples.** Control, management, and autonomy over land are a core interest of many indigenous cultures. If a mining company acts under laws set by a national government that do not recognise indigenous rights, and attempts to operate in indigenous areas, conflicts are almost certain to arise. Prior informed consent arrived at democratically, or through culturally appropriate decision making processes, may be the appropriate model for indigenous communities, but successful implementation will require cooperation from government. Where there is serious conflict between national government and indigenous groups, it is difficult for a company to operate successfully.

Ultimately, those who cannot say 'no' to development cannot say 'yes' in any meaningful way either. Indigenous communities that have established rights to their land are more likely to regard minerals development as a potential way forward in their own development, while communities whose hold on their land is tenuous are likely to regard mining as a threat.

**Resettlement.** Involuntary resettlement is increasingly a rarity in the mining sector. Sites where development is contingent on involuntary resettlement should be avoided wherever possible. Respect for the rights of the community remains true regardless of whether communities have recognized legal title or not.

Resettlement programmes should be premised on prior informed consent of the host community, although there is considerable debate in industry and governments about the ways in which this can be operationalised. Where resettlement takes place, companies need to ensure that living standards are not diminished, that community and social ties are preserved, and that they provide fair compensation for loss of assets and economic opportunity. Roles and responsibilities for ensuring the long-term well-being of resettled communities need to be defined and monitored.

**Protected Areas.** At present, 44 World Heritage Sites are reportedly affected, or potentially affected, by mining. In 2000, the World Conservation Congress of the IUCN agreed to a resolution restricting mining in protected areas.

Most protected areas are inhabited. Environmental, mining and other interests should be considered only in conjunction with those of the often poor and politically marginalized peoples who live in these areas. There should be broader discussion of protected areas management and trade-offs. It needs to be recognized that some protected areas are only 'lines on a map' with little effective management on the ground, often because governments simply lack resources, or because the areas were created without consultation such that local people have little stake in their viability. Both the local stake in the success of protected areas and the resources available to manage them need to be increased. Minerals development could in principle help fill these gaps, but there is profound suspicion of any proposal to mine in or near protected areas. A lack of successful examples where this principle has been concretely demonstrated is a major obstacle to progress.

Threats to protected areas and places earmarked for biodiversity conservation are not limited to mining: many of these areas are deteriorating rapidly, and this trend will be exacerbated if alternative and less damaging economic opportunities cannot be found. Ecotourism might be a solution in some areas. In other areas, the mining industry could

help fund conservation projects if it can be demonstrated that mining can be conducted in a fashion that respects the special qualities of protected areas.

### ***Minerals and Economic Development***

Minerals development should bring economic benefits, particularly to poor countries and regions that lack alternative sources of development. Yet some countries do not seem to have achieved sustained economic development through minerals production. In addition, a concentrated stream of wealth in an otherwise poor region may have had a detrimental effect on social and political life, leading to corruption, authoritarian government, human rights abuse, or armed conflict.

The solution is to find better ways to manage the wealth which is generated from revenues accruing from project-related taxes, royalties, and other transfers paid by the company to government. Managing such wealth requires analyzing the allocation of payments between (i) public and private sector and (ii) among the central, regional and local levels of government.

A country should expect to benefit from minerals production through additional employment, both direct and indirect. Mining activity should also generate new infrastructure such as roads, electricity supplies, schools, and hospitals. The economy as a whole can be stimulated through outward linkages, upstream to industries that supply goods and services, or downstream to industries that process mineral outputs. Minerals investment can also provide training to the work force and transfer new technologies. Finally, there are more general economic benefits, including injections of hard currency, along with royalty payments and corporate taxes.

Trade barriers might have worked against developing countries too. The era of free trade has hardly made free trade uniform. Tariff and non-tariff barriers make it difficult for developing economies to capture more value added in the minerals chain.

***Capturing Mineral Wealth and Attracting Investment.*** Over the past decade more than 100 countries have reformed their mining law to attract minerals investment. Many governments also offer mining companies cheap or subsidized use of land, water, and energy. While encouraging investment, this can also encourage profligate use of natural resources – with damaging environmental consequences.

Maximizing the gains from private sector mining requires policies which provide for an equitable share of revenues between government and investor. Governments have to strike a balance between deriving an adequate share of rents and not discouraging investment by over-taxing; setting the threshold will depend on local circumstances and priorities.

If governments and international institutions are to continue to adopt legal and institutional changes to encourage mineral investment, appropriate principles and boundaries for this process should be determined. Governments should provide companies with geological information to encourage exploration, should set policies that define the conditions under which exploration, development, and mining occur, and should aim for a non-distorting

policy environment. To address these issues:

- inter-governmental groups such as the World Mines Ministers, CAMMA, APEC, and others could work to develop statements of principle about appropriate terms for concessions, stabilisation agreements, or legislative frameworks;
- the World Bank and United Nations organizations (such as UNCTAD and UNDP) could provide further policy guidance in this area; and
- all parties could encourage a clear public debate on a definition of principles that balance fair protection for investors with a fair return to host governments, including calculations of all revenue and indirect payments.

**Managing and Distributing Mineral Wealth.** Revenue management pertains to how rents are utilized by the public sector to support legitimate development at national, and, increasingly, at regional and local levels. Governments need to consider whether to save mining income for future generations or to invest it in ways that provide lasting benefits, such as human development and physical infrastructure.

Revenue management requires, in the first instance, a sound macroeconomic framework – pro-poor policies and transparent public expenditures management, as well as adequate capacity on the part of government to manage project-generated revenues. A lack of capacity, economic resources, effective participation or political will and misunderstandings of local needs are often the source of inequities and inadequacies. Where governance and national-local linkages are weak, little of the national governments’ revenues may be distributed to the communities.

Economic policy is a key determinant in creating wealth from mineral resources; looking at whether and how this revenue is being converted into human and social capital to achieve sustainable economic development; how risks that are present in mining but which do not occur in other areas of the economy can be mitigated through for example special tax provisions for mining, safeguard policies; and the benefits and risks of a decentralization policy. This in turn will require analysis of the capacity of government at all levels to utilize project revenues for legitimate development purposes. Governments with a rapidly expanding mineral sectors will have to cope with its effects on other parts of the economy. For effective planning in the long and short term, mining ministries should be working with other ministries, NGOs and mining companies – to pool and capitalize on their different skills and experiences.

Price volatility also challenges many mineral-producing countries. Governments could take a number of mitigating measures: taking ‘commodity loans’, establishing a mineral revenue stabilization fund, or planning for volatility on the expenditure side.

**Corruption.** A major obstacle to the equitable distribution of minerals revenues is corruption. Corruption undermines a country’s social fabric, distorts the government’s priorities, undermines efficiency and economic growth, and drains revenue that could have been invested in human development. Some companies in the minerals sector may have colluded in a variety of illicit activities – bribery to obtain licences and permits, to get preferential access to prospects, assets, or credit, or to sway judicial decisions.

Minerals operations, particularly mining, often take place in poor countries where corruption is prevalent. But the minerals sector itself has several characteristics that further heighten the risk, such as the large capital expenditures involved, the extensive regulation required, the fixed locations and the multiplicity of small players. Companies are also affected by corruption elsewhere in government. If politicians or officials siphon mining revenues into their own pocket, local people will reasonably conclude that mining brings them little benefit, and the companies will suffer the consequences. Corruption among local officials can also create a governance vacuum that pulls mining companies into taking on too many responsibilities. Where mining companies take on government-type roles, resentment and conflict may be created.

Many actors have attempted to address the problem. Some minerals companies restrict their operations in countries where corruption is rampant. NGOs and international institutions such as the World Bank have introduced sanctions on corrupt firms. Individual governments have also taken steps to fight corruption in domestic companies operating overseas. International concerted action is needed to combat corruption. Among the measures needed for the minerals sector are:

- individual company codes of ethics for employees and contractors, with requirements for sign-offs, employee support mechanisms such as internal help lines to report irregularities;
- action by industry organizations to establish common industry-wide guidance and an international register of company payments to national and local governments;
- government adoption of national legislation to put the OECD anti-corruption convention into effect (recognizing that the complex issue of ‘facilitation payments’ is not yet covered); and
- company collaboration with other sectors, NGOs, and chambers of commerce to move as a block to disclose all payments.

***Protecting and Promoting Human Rights.*** Some mining companies have been accused of human rights abuses, for actions taken either independently or in collusion with governments. Some of the worst cases have occurred when companies have relied on national security forces to gain control over land or defend established premises. Miners’ rights are threatened by difficult and dangerous working conditions, and there is a long history of labour-management conflict. While labour-management relations have improved in most parts of the industry, problems remain in areas under authoritarian governments.

Over the past 10 years, the world has paid greater attention to human rights. States that tolerate human rights abuses inside or outside their boundaries are increasingly considered internationally unacceptable. Some advocates argue that multinationals should take responsibility not just for respecting but promoting human rights. The rights-based development idea has also become more widespread. These changes have been reflected in the policies of the UN and other international agencies. National governments and NGOs have also been establishing the norms that they expect companies to follow. Some companies have started to formalize their commitment to human rights, producing their own codes of conduct on rights, or working to incorporate the Universal Declaration of Human Rights principles into their business principles and internal guidelines.

The human rights initiatives needed include company- and industry-wide human rights guidelines and indicators, lobbying of governments to adhere to some form of human rights code, and partnerships at the national level to build capacity and improve governance. Individual companies could commit to following the Universal Declaration of Human Rights and agree to third party monitoring or verification, and extension to all local contractors. Companies could also adhere to the Voluntary Principles on Human Rights and Security.

**Armed Conflict.** Many mineral deposits are found in politically unstable areas of the world. Mining can provide a source of funds to sustain outbreaks of violence – where combatants sell minerals through illegal channels to fund military campaigns. Large-scale in-migration at mine sites can cause resentment among those already living there. When mining revenues are not equitably shared, armed conflict may be provoked. Similar disruption can occur at mine closure.

Armed conflict also deters mining investment. Conflict prevention strategies can benefit from cooperation with donor agencies, NGOs, and other institutions. Companies should conduct conflict impact analysis prior to investment decisions, maintain transparent channels of communications with stakeholders who may be in conflict, and cooperate with conflict-prevention NGOs to build capacity in and around the mine site to prevent conflict.

### **Local Communities and Mines**

Mineral development can create new communities and bring wealth to those already in existence, but can also cause considerable disruption. New projects can bring jobs, business activities, roads, schools, and health clinics to remote and previously impoverished areas. These benefits may be unevenly shared, and may be poor recompense for damaging existing livelihoods and the environment. Mining can also lead to social tension and violent conflict.

Mining's interaction with local communities has changed over time. Mines have become larger and more technically complex, bringing a decrease in employment and an increase in the skill levels required. In many countries mines have tended to become specialist enclaves, isolated from other sectors of the economy. The premier example of this is 'fly-in, fly-out' operations based on long-distance commuting. The communities living nearby are less likely to benefit from new jobs, business opportunities, and the multiplier effects of development, though the risk of creating towns that are not sustainable after mine closure is reduced.

**Sustainable development at the local level** is about meeting locally defined social, environmental, and economic goals. The effect of interactions between a mine and a local community should add to the physical, financial, human, and information resources available to that community. Mineral activities must ensure that the basic rights of the individual and communities affected are upheld and are not infringed upon. These include the rights to the control and use land, to clean water, to a safe environment, and to a livelihood; the right to be free from intimidation and violence; and the right to be fairly compensated for loss. The interests of the most vulnerable groups must be protected. There

should be equitable distribution of benefits within communities – benefits that are sustainable after the life of the mine.

For communities to participate effectively in sustainable development decision-making processes, there needs to be a relationship of collaboration and trust between the community and other actors. The presence of a large mining operation should not undermine the ability of the community to negotiate and influence activities in their vicinity. It is critical that mechanisms are put in place for effective participation by local communities in decision-making.

A key challenge is determining who is responsible for realizing outcomes at the community level. Many of the actors – government, companies or communities – may be ill-equipped; and the law may provide little guidance in areas where local government and governance structures are weak. When communities turn to the operating companies, and when companies provide services in a paternalistic manner, dependence on the company may ensue – creating a situation in which benefits cannot be sustained when the mine closes.

A new relationship is beginning to emerge between mining operations and communities, based on the recognition of community rights, needs, and priorities. This approach centres on trying to work well with informal local governance structures, recognizing that opportunities that support communities and which operate within the resource capacity of participating stakeholders should form the core of interactions between mining companies and communities.

***Revenue Distribution and Use.*** Often all taxes and royalties from minerals operations have gone straight to the central government, and the only benefits that communities could expect were those that trickled down through central government spending. In many countries, negotiations are increasingly including communities and local authorities in the sharing of taxes and royalties.

The redistribution of wealth from national to local level can be facilitated through policy and legal reform. The share of revenue received by the community should be open, transparent, and preferably discussed through a multistakeholder process and incorporated into initial agreements between governments and companies. The design of policy, regulations, and agreements must reflect the capacity to implement them. In the short term, where there is insufficient government capacity to distribute revenue, the best option is to take a collaborative approach, where companies and NGOs work with government and, at the same time, build local administrative capacity. In the long term, the aim should be that a local administrative structure take over the role of redistribution. Alternatively, revenue can be redistributed directly to communities through equity payments or investment funds.

Ideally, communities should decide how the revenues are used at community level. The most appropriate path will vary on a case-by-case basis, depending on the community's relationship with government and the availability of economic activities, services, and savings opportunities to which funds and revenues can be directed. To do so effectively, communities will need to develop planning, decision-making, monitoring, and dispute resolution capabilities. International agencies, donors, and NGOs can play a key role in helping individual communities to develop these capabilities.

**Gender Disparities.** Women are often disadvantaged by the advent of mining and minerals development, yet it also has the potential to improve women's economic and social situations. Gender considerations need to be mainstreamed so that the new projects' effects and opportunities for women in the community are fully considered.

**Projects, Funds, and Foundations.** Increasingly some minerals companies – often in collaboration with governments or other groups – are establishing programmes to ensure that communities share the benefits of mineral development. These include tax credit schemes, funds, and foundations. Lessons from the establishment of such programmes are clear. They should be managed by an independent structure to ensure trust and institutional sustainability. In the longer term, non-company financing mechanisms would strengthen the likelihood of the funds being sustained. Ideally, governments or NGOs should take primary responsibility. Mechanisms should be designed in a way that supports and strengthens rather than undermines government capacity.

**Employment, Local Businesses, and Skills Development.** Companies are increasingly adopting preferential procurement policies towards local suppliers and distributors. This is being enforced through provisions in national policies and legislation concerning foreign direct investment. Preferential procurement policies towards local suppliers should be incorporated into mining agreements and company policy. Local procurement should be accompanied by skills audits and development for workers, as well as the identification of additional economic activities to reduce the community's dependence on the mine. Cultural awareness programmes may be needed for all employees.

**Retrenchment.** Some initiatives are geared towards the concerns of workers who lose their jobs. These include temporary income support measures such as severance packages, redundancy payments, early retirement etc; active labour worker services such as job counselling and retraining; job creation initiatives such as business incubators, micro enterprise credit schemes, workplace schemes, business counselling etc; and long term unemployment benefits and social security support. Such efforts will be of limited success if initiated only when retrenchment is a reality. Workers should be made aware of the possibilities of redundancy from the outset of their employment. Planning including skills development and savings schemes should be geared towards maximizing workers finding alternative sources of employment or returning to their previous employment.

**Conflict and Dispute Resolution.** Disputes and conflict between communities and mining companies, government, or other actors, as well as within communities, can be minimized if the interactions are managed appropriately. Where these do arise, they need to be resolved. There is a serious lack of accepted dispute resolution mechanisms for local issues, as reflected in the number of essentially local issues that escalate to national or even international levels.

**Community Health Initiatives.** Health services provided by companies to employees and communities has generally reflected an inadequate understanding of local needs, as well as a lack of consideration for the inability to sustain such services after the operation closes. Beyond work-related diseases, few endeavours attempt to prevent diseases that affect the

wider community, or to consider the broader well-being of the community. A number of companies are taking steps to reflect better the needs of employees and broader communities in the design of health care. Some companies are now taking on a broader role in community health programmes by working in partnership with other stakeholders.

The planning and delivery of health programmes around mine sites should be based on a partnership approach, with a strong role for the local community in design and implementation. This is the only way their benefits can be sustainable. Programmes should include capacity-building as a short-term objective. In the longer term, government should lead the continuation of health programmes. Where government capacity and resources are lacking, independent trust funds may be developed. Best practice guidelines should be developed to drive progress in the implementation of community health policies and programmes.

***Mine Closure.*** The closure of a mine can have dramatic social effects. A strategy for mine closure needs to be an integral part of mine development and operational planning. At a minimum, consideration needs to be given to creating mechanisms, institutions, and processes to ensure sufficient funds for mine closure, and economic activities need to be in place to sustain the community post-mine. These issues cannot be deferred and require clear, up-front commitment from government, companies, and communities.

***Effective Community Participation in Decision-making.*** Multistakeholder forums run by independent parties can provide an effective means of facilitating community awareness, capacity-building, and involvement, as well as reducing the power differential between the community and company.

***Improved Social Impact Assessment (SIA).*** SIA provides an opportunity to plan how a minerals development project can best support sustainable development and the community's vision of their future. There is an urgent need for common, standard, best practice social impact assessment guidelines for use in the mining industry:

- Sustainable development calls for appropriate methodologies of information acquisition and presentation and a move from SIA to sustainable development assessment.
- SIA should become a dynamic, on-going process of integrating knowledge on potential social impacts into decision-making and management practices.
- Social monitoring needs to become an integral part of SIA.

***Community Sustainable Development Plans.*** Companies should work with governments and communities to ensure that a Community Sustainable Development Plan is put in place at each mine. The Plan should be based on the community's concept of how its interactions with the company can best contribute to its means of achieving its social, environmental, and economic goals. It should also be grounded in the reality of the willingness and ability of the company and national government to contribute to and support those goals. The plan should be designed through a process of consultation that begins during the sustainable development assessment. A multistakeholder forum, administered by an independent party, should be established to ensure the effective involvement of all actors. Independent mechanisms for monitoring and evaluation, including clear and agreed indicators of performance, need to be incorporated into the plan.

## **Mining, Minerals, and the Environment**

Ecosystems produce a constant stream of benefits that are essential to human life and economic activity. These may be regarded as ‘natural capital’. Some of these benefits are considered by many to be essential to human well-being and cannot be substituted by increases in other forms of capital. They are referred to as ‘critical natural capital.’

Whether any particular asset is or isn’t in this ‘critical’ category, it is beyond dispute that natural capital has often been reduced by the operations of the minerals sector. Some of the impacts are of general concern: minerals production may be consuming more energy and emitting more greenhouse gases than is sustainable.

There are other issues of concern in these industries. Mining, minerals processing, fabrication and recycling operations impact only a small fraction of the Earth’s land surface, but its footprint has been heavy. Mining in particular is regarded by many as a more or less permanent, rather than temporary, land use.

The best modern mining operations represent a very great improvement over past practice. However, even the best modern operations may result in some undesirable environmental impacts, and best practice has far to go before it spreads to all parts of the industry. The overall impact of the industry is therefore still a diminution in natural capital stocks.

The challenges are threefold:

- There must be a focus on improving the development benefits the industry brings to make clear that positive gains can be achieved, and that other capital stocks can increase as a result. These revenues and other benefits could also be used to build overall capacity for environmental management that can have benefits far outside this industry.
- There must be a continued drive to improve practice to lower the environmental costs that are paid. This means the best will continue to get better. It also means there must be increasing focus on getting those behind to improve.
- There must be a new commitment by the industry to seek opportunities to improve and build natural capital, so that there are more positives in the ledger to balance against the negatives. Project design should look for opportunities to enhance ecosystems, and to find effective ways of dealing with the legacy of impacts at abandoned or orphan sites.

It is possible to envisage an industry that strengthens and builds capacity of environmental management systems where it operates, reduces current impacts to a minimum, and moves aggressively to ensure that the abandoned mines legacy is addressed, could balance its natural capital account. Much needs to be done to get there. There is also a series of issues that can create very long-term impacts that are difficult to reverse.

**Large-Volume Waste.** Mining produces very large volumes of waste. Facilities designed to contain this waste are among the largest structures built by the human race. Because mining produces such large volumes of waste, decisions about where and how that waste is

disposed are often irreversible. The long-term impacts of the options for waste disposal are among the most important in the minerals cycle.

There are several types of waste – waste rock, tailings, and spent heap leach piles. There are concerns common to all these forms, but each also has its own separate set of issues. Deciding how to dispose of these wastes requires trade-offs that have environmental, social, and economic consequences, short and long term. Finding a way to make the trade-offs in a manner that others concerned will accept as legitimate is a major problem for the industry, as well as for those who will live with the consequences after industry is gone.

The most common solution is to deposit wastes on land. Where companies follow best practice, wastes are placed in designed facilities planned to minimize risks of failure and impact on the environment. There are still often some unanswered problems even with the better facilities, and best practice has still not spread across the industry.

Though most mining waste ends up on land, some companies have deposited waste rock or tailings at sea. The potential impacts of these practices depend on how deep the materials are disposed of, with the greatest impacts found in shallower waters. Disposal in the shallow marine environment is not considered best practice and is not being adopted for new projects by major companies. Greater interest has recently been shown in deep-sea tailings disposal. This remains a controversial option and there is little agreement on its long-term effects. Research is needed, but will not solve the controversy unless it is done in an independent way.

Even more controversial than marine disposal is the practice of dumping rock waste and tailings into river systems. There has been a long debate over whether in some circumstances riverine disposal might be acceptable. Some companies and governments argue that it should be accepted if the alternative is to have no mining at all. Although the likelihood of a new project by a major company using this technique is minimal, it remains the practice in many smaller operations. And until there is clear commitment by large-scale industry to eschew this practice, many environmental organizations are likely to feel hesitation about deeper engagement with industry on waste issues. The task of moving thousands of smaller mining operations out of riverine environments must also move forward.

**Acid Drainage.** Measured by the frequency, severity and duration of its occurrence, acid drainage (AD) is probably the most serious diminution of natural capital of concern in the minerals sector. Managing AD effectively is difficult. Various techniques are available to minimize the problem: effective mine design can keep water away from acid-generating materials and help prevent AD, for instance. But in many cases this is not enough to prevent it altogether. Since AD can result in the very long-term acidification of streams and other water bodies, and elevated metal concentrations, it can be a continuing concern long after the mine life. The costs of abating it are considerable, and have often been borne by society.

**Best Practice for Tailings Dams.** Nothing has tarnished the reputation of the industry more than large-scale accidents, of which tailings dam failures are the most frequent. Tailings

facilities are built continuously through the life of the operation and therefore require both good design and close, consistent, attention over long periods of time.

Considerable progress has been made at the best operations in design, though this is a complex and difficult issue and some design flaws may sometimes remain. And best practice has not spread uniformly through industry.

There are still considerable deficiencies in long-term quality assurance as facilities are slowly constructed over the mine life. These include the lack of any one competent person clearly in charge of overall integrity and safety, difficulty of supervision of personnel in remote locations, lack of proper instrumentation, and loss over time of knowledge of design parameters that should not be exceeded.

***Mine Closure Planning.*** Because decisions about waste handling and other aspects of operations are often so difficult and expensive to reverse, they need to be made right in the first place. The best way to do that is through development of a closure plan at the outset of operations. This can guide individual decisions taken during the mine life to ensure they are oriented toward this objective.

Most mine closure planning now focuses only on environmental aspects of closure. Results for sustainable development could be improved by developing closure plans in an integrated framework for mine closure, in which environmental, social, and economic factors are considered. Such planning will only work if it involves all interested parties, and clearly allocates roles and responsibilities among government, the company, the community, and other actors.

Integrated closure planning is a necessary step to transform mining investment into sustainable development.

***Environmental Legacy.*** The environmental issues of current and prospective mining operations are daunting enough. But in many ways far more troubling are some of the continuing effects of mining and smelting that have occurred over past decades, centuries, or even millennia. These sites have proved that some impacts can be long-term and that society is still paying the price for natural capital stocks that have been drawn down by past generations.

Improving these sites could create benefits, which could offset any deficits attributable to current operations. And at some of these sites even a relatively small investment can have a big environmental payback.

At the national and international levels, new funding mechanisms need to be developed to tackle these problems, or they will be a burden on future generations.

***Environmental Management Systems.*** Environmental Impact Assessment (EIA) is perhaps the most widely used tool of environmental management in the minerals sector and elsewhere. Recently, social and economic factors have tended to creep into this environmental exercise; this should be deliberately promoted as part of a move toward

integrated impact assessment for sustainable development. EIAs are now mandatory for most large-scale development projects. However, their implementation is often abysmal.

EIA should be part of an environmental management system (EMS) that seeks to integrate environmental responsibilities into everyday management practices through changes to organizational structure, responsibilities, procedures, processes, and resources. An EMS provides a structured method for company management and the regulating authority to have awareness and control of the performance of a project that can be applied at all stages of the life cycle.

At the corporate level, respect for both the physical and social environment is now considered to be an essential element of good business practice. Risk assessment and management are becoming increasingly important in the development of a mining project, where uncertainties associated with environmental (and social) prediction are potentially higher than in some other industrial sectors.

***Recommendations for Managing the Mining Environment.*** The International Council on Mining & Metals (ICMM) and other appropriate convenors such as UNEP should initiate a process for developing guidance for the disposal of overburden, waste rock, and tailings and the retention of water.

Industry, governments, and NGOs should agree on a programme of independent research to assess the risks of marine and, in particular, deep-sea disposal of mine waste. A clear commitment by industry to eschew riverine disposal for any future projects would set a standard that would begin to penetrate to the smaller companies and remoter regions and build confidence which could allow better dialogue on other issues. Industry might be more likely to take this step if it had confidence others would cooperate in looking objectively at other options.

Governments should establish legal frameworks for integrated planning for closure, and companies should in the meantime adopt this as the model for their activities.

***Energy Use in the Minerals Sector.*** The current level and pattern of energy use affects global environmental conditions. Mounting scientific evidence shows that a root cause of global climate change is gases emitted from the burning of fossil fuels and other sources. Governments, industry, and the general public play a key role in both contributing to global energy use and providing policies for addressing the resulting problems.

Mining involves the movement and processing of large volumes of material, all of which requires a source of energy. Many finished products that depend on mineral commodities to function consume considerable amounts of energy, such as motor vehicles and electronic goods. The mining and minerals industry may sometimes, influence decisions about investment in power sources. Several mineral commodities, most notably coal, are used as fuels.

It is sometimes said that 4–7% of global energy demand is used in ‘mining’, but it is very hard to determine an accurate figure. During the twentieth century, the sector achieved dramatic advances in energy efficiency. The energy efficiency of products has significant implications for the amount and type of metal used.

***Managing Metals in the Environment.*** A number of metals are of environmental concern because of their potential chemical toxicity. These toxic properties have been exploited in the design of pesticides or antiseptics. Concerns are not restricted to sites of metals production. The use of lead in gasoline and paint (now phased out in many countries), is but one of many examples; concerns include occupational exposure.

Managing metals in the environment requires dealing with scientific uncertainty and deciding on appropriate levels of precaution. This is not just the realm of scientists and politicians. Perceptions of the benefits of use of a metal, the merits of alternative materials, and the likelihood of mismanagement are fundamental determinants of the chance of harm.

Metals and metalloids can be released into the environment at all stages of the minerals cycle. The problem is ensuring that all in the minerals sector clearly allocate and share responsibility for managing the risk of harm.

The world has steadily learned more about the environmental chemistry of metals. This has helped reduce some of the most harmful emissions. For example, dispersion of arsenic has dropped significantly over the last two decades. However, while many people in industrial countries benefit from reduced risk of exposure, there are still serious problems in many developing countries.

Penalties and incentives can be used to reduce emissions, but additional strategies are emerging to manage the risk of harm more effectively. For example, the growing interest in product-oriented public policy, particularly in Europe, has the advantage of taking into account the entire supply chain.

***Biodiversity.*** A loss of biodiversity is a loss of natural capital. It is irreversible. Some companies have formulated biodiversity policies and introduced innovative design and operating management. Such remedial actions are encouraging but still largely restricted to the major players. Governments have found it difficult to create the incentives to encourage conservation.

The Convention on Biological Diversity (CBD) provides the minerals sector with a politically sound basis for engaging in constructive dialogue and partnerships with the biodiversity community. It is a key instrument of the global programme for sustainable development.

Though the minerals sector is not necessarily the most important influence on biodiversity in a particular region, its operations can have an important effect on it. The greatest risks may be in or adjacent to undisturbed areas, where building access roads to exploration sites brings significant risks to relatively undisturbed ecosystems. Acid drainage is also a serious threat to biological diversity in aquatic systems.

Actions needed include strengthening capacity in integrated land use planning, funding shortfalls in biophysical science, improving access and coherence of information on biodiversity priorities, and articulating and enhancing biodiversity better practice within the mining industry.

## **Access to 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 improving all participants' ability to negotiate effectively with legitimacy. Information should be a 'levelling tool' so that all stakeholders might participate in decision-making on equal ground. Authoritative, independent sources are critical for ensuring that information is regarded as legitimate and respecting the right of stakeholders to have access to accurate and relevant data. Systems of accountability and verification are essential to monitoring the performance of companies, governments, and civil society.

Access to information is also linked to the ability of individuals to obtain and defend fundamental rights to resources. Intellectual property rights must be observed and confidentiality preserved, particularly when breaching it would unfairly jeopardize privacy rights or financial or social security. Information must be collected and distributed in an equitable manner to ensure this. There should be an underlying recognition that the need for and capacity to gain access to information is particularly acute for some, such as communities, who suffer under power imbalances with other actors. NGOs, in addition to governments and companies, have a major role to play in this area. The digital divide also presents imbalance; international and multilateral bodies, governments, NGOs, and industry all have an important role in making new information resources available.

Lack of information and understanding leads to lack of clarity and to misunderstandings: information and disclosure must be married with clarity, transparency, and education. Disclosure must be met with disclosure, particularly for multistakeholder processes and decision-making: government, industry, labour, NGOs, communities, and other actors must perform to the same standards of accountability that they expect and demand of others. NGOs and others should work together to monitor and ensure that there is fair and unbiased disclosure of information.

The processes for establishing the norms and standards of information generation and transfer, the regulatory system to ensure conformity to these standards, the opportunities for reaction in the public domain, and the freedom to participate without fear of reprisal are largely the responsibility of state governments, with the cooperation of other actors.

Numerous initiatives and recommendations on information are available in international instruments, such as Principle 10 of the Rio Declaration, OECD and European Union recommendations, the UN Berlin Guidelines, national government provisions, and several voluntary efforts such as the Global Reporting Initiative. The World Bank Group has guidelines on public disclosure of environmental and social operational documents.

International and multilateral organizations should address the needs created by global integration and collaboration – an international mining database; criteria for a harmonized public reporting system; and mechanisms for better collaboration between industry, government, and civil society on accountability and information issues.

## **A Life-Cycle Approach to Using Minerals**

The use and downstream supply of mineral products has implications for sustainable development and must be considered along with the mining and processing of minerals. Current patterns of minerals use raise concerns about the efficiency with which they are exploited and the need for more equitable access to these resources world-wide.

Much of the concern, policy and regulation regarding the use of minerals has focused on environmental issues, health risks associated with use, and the long-run availability of these resources. A number of conceptual tools aimed at increasing efficiency and calculating optimal levels for recycling of use have been developed to this end. The social and economic dimensions of use and of potential future changes are generally not given equal consideration.

**A Cradle-to-Grave Approach.** Taking a life cycle, or ‘cradle-to-grave’, approach is challenging, because the link between the production and use of minerals is often weak. Most users are unaware of the origin of mineral products or how they are incorporated into a final product. The diversity of the sector, and the vast and ever-increasing range of applications for minerals, adds to this challenge. Life-cycle approaches – including product stewardship, life-cycle assessment, consumer awareness, market-based instruments, appropriate regulation, and more effective supply chain management – are key to ensuring greater connection between production and use of minerals.

Product stewardship is based on commitment and collaboration from all actors along the supply chain. It provides a useful way to devise tools and assign responsibilities for waste prevention and appropriate product design, and to encourage recycling, re-manufacture, or re-use. To date, product stewardship initiatives have focused on the end of a mineral product’s life and must be extended to consider the entire life cycle.

Life-cycle analysis (LCA) involves measuring and appraising the environmental impacts of products from the beginning to the end of their life. It can be used to enhance the quality of supply chain management, to aid policy development, and to support recycling initiatives.

Responsibilities for reducing the negative impact the exploitation, use and disposal of minerals and metals, as well as associated costs need to be shared between actors and along the supply chain. This applies to costs not just incurred in use but throughout the whole supply chain.

**Sufficiency, Efficiency, Equity and Use.** Environmentalists and others have called for a reduction in the material throughputs that support many national economies, particularly in the industrial countries. Such calls challenge those who directly influence the ways in which minerals are used in products and challenge users to reduce their levels and patterns of use and disposal. Resource efficiency can be increased in numerous ways including recycling, product re-manufacture and re-use; substitution; and in some cases avoidance of use.

Concerns about the magnitude of material throughputs need to be addressed carefully.

- Changes in production and use based on environmental concerns should consider social and economic implications. Where change is necessary, the consequences should be distributed such that they do not reinforce existing disparities or cause avoidable hardship.
- Resource efficiency should not impede the goal of meeting the basic physical needs of all.
- Change must be implemented over a time frame sufficient to enable producer countries to develop the capacity to adapt.
- Optimized resource efficiency for multiple materials relies on thorough assessment of the trade-offs among social, environmental, and economic criteria.

Competition and other commercial pressures have led to significant changes in the resource efficiency of products over the last few decades. The business case for eco-efficiency has been outlined by numerous organizations. Eco-efficiency, or business-level practices to achieve resource efficiency, need to be accompanied by effective government policies. Governments need to determine how resource efficiency targets set by them may be achieved. They need to manage the demand for minerals such that it does not outstrip improvements in resource efficiency.

A wider role of government is that of education and public information sharing. The ultimate challenge for all stakeholders is to develop an extended sense of responsibility for the way they use mineral resources. Governments of industrial countries should also work with developing countries that have increasing demands for mineral products so that resource efficiency measures are implemented globally.

Recycling is associated with many of the same trade-offs between environmental and social factors as the extraction of minerals and ores. Consequently, there will be an optimum recycling rate for any mineral product that can be recycled. Of concern from the perspective of poverty alleviation is that a large proportion of recycling may happen in industrial countries. If recycling is to be encouraged, broader integration and consistency in environmental policy-making, including difficult trade-offs between different environmental goals, is needed. Technological advances are also key, as is the availability of information on the material available for recycling.

In addition to recycling, product re-manufacture and re-use can help slow the growth in demand for primary mineral commodities. These can have some environmental advantages over recycling, since more of the energy and capital cost embodied in the product are conserved. Consumer desire for the latest hi-tech equipment does, however, pose challenges for re-manufacture and re-use.

**Regulation and End Use.** The environmental and health impacts of the use of different mineral products need to be carefully managed. Where the risks associated with use are deemed unacceptable or are not known, the costs associated with using certain minerals may outweigh the benefits. It is primarily a government responsibility to balance these

uncertainties using the precautionary approach. Industry can generate much of the information required to ensure that such judgements are science-based.

### **Artisanal and Small-Scale Mining**

In many parts of the world minerals are extracted by artisanal and small-scale mining (ASM) – by people working with simple tools and equipment, usually in the informal sector, outside the legal and regulatory framework. There are also many artisanal mineral processors, such as diamond polishers. The vast majority are very poor, exploiting marginal deposits in harsh and often dangerous conditions – and with considerable impact on the environment.

Small-scale mining is thought to involve 13 million people directly and affect the livelihoods of a further 80–100 million. A broad range of minerals is extracted by artisanal and small-scale miners, including gold, gems, precious stones, and metals. On a national scale, total production can be significant – in some cases equalling or exceeding that of large mines. They produce a considerable fraction of the world's mineral production, though precise figures are hard to establish. In recent years, ASM is said by some sources to have accounted for 15–20% of the world's non-fuel mineral production.

There is a distinction between artisanal mining, which may involve only individuals or families and is purely manual, and small-scale mining, which is more extensive and usually more mechanized. Artisanal miners are more likely to be working without legal mining title. Most of these miners are unskilled, rural, and poor. They often come from communities that have a long tradition of small-scale mining and may work seasonally. People also take up mining as a last resort during periods of economic recession. Others can suddenly be drawn into mining following the discovery of new mineral reserves.

Women are frequently involved in ASM and may face various forms of prejudice. ASM also involves significant numbers of children. Child labour (which is largely a product of poverty) is illegal in most countries. Young children are vulnerable to physical and chemical hazards. Beyond this they also suffer psychological and social disadvantages and may sacrifice future prospects.

ASM is an important aspect of rural livelihoods. It often represents the most promising, if not only, income opportunity available. But it can also be very disruptive – particularly when it takes the form of a sudden 'rush' causing local people to desert their farms and resulting in in-migration. When the rush is over, most of the profits are likely to have disappeared while the social and environmental damage persists.

The environmental impacts of ASM are of greatest concern to many: mercury and cyanide pollution, direct dumping of tailings and effluents into rivers, threats from improperly constructed tailings dams, river damage in alluvial areas, river siltation, erosion damage and deforestation, and landscape destruction. A lack of awareness combined with a lack of information about affordable methods to reduce impacts and a lack of obvious incentives to change all contribute to these problems. To many people these are unacceptable and sufficient reason to ban many forms of ASM. How to ban it – especially when there is no proposal for alternative livelihoods – is less frequently addressed.

Small-scale miners often operate in hazardous working conditions. Health risks are numerous and frequent. Major causes of accidents are subsidence, lack of ventilation, misuse of explosives, lack of knowledge and training, poor equipment, and lack of legislation or enforcement on health and safety issues. Problems of inadequate sanitation are likely to prevail where miners converge around a freshly discovered deposit or settle in unorganized camps. Camps can also be breeding grounds for crime, prostitution, and sexually transmitted diseases.

***Relationships with Others in the Mining Sector.*** Artisanal and small-scale miners work largely in the informal sector. In some cases this is a matter of choice. Often, however, governments choose not to recognize ASM activities and may even ban them. Informality extends to the marketing of products and makes miners vulnerable to exploitation by intermediaries or traders. Products can be diverted into illicit channels and are frequently smuggled. They can also be used to launder money or finance rebel activities.

Few governments have had much success in supporting ASM, in monitoring activities, or in controlling their impact. Artisanal and small-scale miners will only formalize and register their operations if they see advantages to doing so, such as gaining access to technologies, services, training, financial assistance, or markets.

For most governments there are fiscal advantages to regulating ASM. Equally important is the role ASM has in rural development and the fact that the problems associated with ASM are likely to worsen if ignored, with implications for broader society.

There is often tension between large mining companies and smaller-scale operators. Where they do not have formal rights to land, small-scale miners are often forced into illegality when large companies are granted legal entitlements. Government intervention to enforce company entitlements is sometimes used, leading to resistance by small-scale miners and even serious conflicts. Some of the worst cases of human rights abuse against small-scale miners have allegedly occurred in such circumstances.

During operations, companies have often been ill equipped to build good relationships with small-scale miners and have tried to keep them at bay through security systems. Difficulties are compounded by a lack of government presence or support for ASM. Some companies are now trying to build constructive relationships through, for example, setting aside areas for small-scale miners to work and providing alternative employment and other forms of assistance.

Efforts to assist ASM should take into account the existing socio-economic system and consider how mining can best contribute to poverty reduction and sustainable development in the context of holistic local or regional development. Where feasible, a proportion of revenues should be invested in ways that bring sustained benefits. ASM activities should be incorporated in relevant regional and local development programmes. Alternative economic activities should be encouraged where possible.

Programmes of assistance should focus more sharply on gender issues – ensuring that women are fully involved and gain equally from inputs and resources. Regarding child

labour, the ultimate objective must be to eliminate the practice. In the meantime, it is important to improve the conditions for children currently involved in mining.

Governments are unlikely to be able to raise environmental and safety standards immediately simply through legislation and enforcement. A more realistic approach is to raise awareness of the risks and to demonstrate less dangerous alternatives. In particular, miners should be alerted to the dangers of mercury amalgamation and should be offered appropriate techniques for using mercury more safely, and ultimately not at all.

The profits retained by ASM communities can be increased in a number of ways. One is for mining communities to establish processing industries of their own. Another is to make it easier to divert ASM raw materials to existing manufacturing enterprises. Direct links with the growing 'fair trade' movement could also help achieve better prices and provide incentives for ASM to make a better contribution to sustainable development in general.

Lack of credit has been identified as a bottleneck to higher levels of productivity. Finance need not be confined to banking and credit schemes. Funds can come from a range of more specialist institutions, such as exploration funds or mining development banks or through leasing equipment, selling shares, and establishing joint ventures.

ASM normally lacks any sort of organized representative structure. Small-scale miners can benefit from forming associations for obtaining finance, marketing, pooling equipment, or collecting by-products. Consideration needs to be given to the management and continuing financial viability of associations. One possibility is to arrange for the trade association for larger mining enterprises to represent the interests of artisanal and small-scale miners by having ASM groups as associate members.

The lack of local ASM associations is mirrored at the international level. Modern communications technologies have created new options and the Communities and Small-Scale Mining initiative aims to improve coordination between organizations and to disseminate information on best practice.

Larger companies have begun to pay greater attention to their relationships with those near mines – including artisanal and small-scale miners. They see the benefits of greater cooperation in avoiding tension and potential conflict. Artisanal and small-scale miners also have much to gain.

Governments should develop consistent and transparent regulatory frameworks that encourage miners to move into the legal and formal sectors.

Artisanal miners' perspective should be included in any process or forum that may affect their interests.

## **Roles, Responsibilities, and Instruments for Change**

In addressing many of the challenges discussed in this report, all the actors – governments, companies, labour unions, international institutions, communities, and NGOs – need to understand and be able to fulfill their roles and responsibilities. This involves the redefinition of some roles, as well as the introduction of new instruments for change. It requires all actors to respect a core set of governance principles, as well as the broader objectives of sustainable development.

### ***National Policy Framework***

There are numerous components to the national policy framework governing the minerals industry. Governments have a key role in establishing and implementing this. Where governance is weak, other actors have attempted to fill part of the gaps.

A key role of national governments is to provide the *legislative framework* for the minerals industry. Effective legislation is in the interests of the regulator, the industry, as well as communities. Law must be sensitive to local circumstances, cultures and the trade-offs between social, environmental and economic costs and benefits. *Mining acts* are the principal regulatory instrument governing the extraction of mineral resources, defining the rights and obligations of companies. Though the reform of mining codes addresses environmental concerns and, occasionally, social issues, this process has largely focused on addressing the concerns of investors and lenders.

Legislation specific to mining is only one part of the policy framework governing this industry. *Investment laws*, for example, set out the basic conditions of security for foreign investment. The stability of *taxation laws* is very important to mining investment. *Business law* sets out the basic framework for the pursuit of profit at the national level, governing the relationships between owners (such as shareholders) and managers (often directors) of businesses. It sets out the basic rules that govern how the interests of financial stakeholders are protected and financial risk allocated. *Labour law* is critical for the protection of workers in the minerals sector. It deals with issues like terms of employment, job security, dismissal, and the rights of injured workers. It also deals with the rights of trade unions and the issues of health and safety, and child labour. *Land law* deals with land tenure – the acquisition, disposal, use, protection, and management of land. *Environmental law* is increasingly important to in regulating the minerals industry. This starts with the requirement for environmental impact assessment, but may be accompanied by a ‘framework law’ establishing the national environmental authority. The tensions created by environmental law, for instance between different divisions of government, need to be carefully managed.

Some *international conventions* are important to the minerals including those concerning environment, labour, corruption and rights to information or participation in decision-making. For various reasons these are not always implemented by governments in the form of national legislation. There is currently no international governance regime or statement of principles for mining or mineral resources.

There are several other instruments that can contribute to the national policy framework for the minerals sector. These include the setting of standards and criteria for measuring

performance, as well as performance targets. *Market-based instruments* are increasingly attractive because they can produce a desired outcome at lower cost than regulation by encouraging innovation and continuous improvement. *Voluntary agreements, covenants, and other instruments* sometimes described as self- or co- regulatory mechanisms are finding an increasingly important place in the regulatory system. Governments have a key role in establishing *financial surety or rehabilitation bonds* prior to project approval. For these to be effective governments require a good understanding of the issues involved. The liabilities and costs of associated with closure are a key governance challenge to be addressed in the national policy framework for the minerals sector.

*Enforcement mechanisms* are fundamental to changing the behaviour of companies. The increasingly complex legislative requirements require new approaches to enforcement as well as training and institutional strengthening to support the enforcement agency. *Litigation* can help to provide clarity and an enforceable outcome. The extent to which private parties have access to litigation, including right of standing and intervention, depends in part on national statutory provisions. In many countries, even where claimants have serious, valid complaints, their national court systems do not necessarily afford them clear and speedy remedies.

### ***Lenders, Investors and Consumers***

***Sustainability Criteria for Investment.*** These can be used to set out the conditions for the investment of funds by institutional investors in equity or debt markets. Criteria include requirements for a commitment to environmental awareness and accountability and comprehensive, systematic public reporting. Many ‘sustainability’ criteria have none or very few minerals companies in their portfolio. Experience to date indicates that sustainability criteria can encourage publicly traded companies to change their behaviour.

***Sustainability Criteria for Lending.*** Financial institutions are potentially an important leverage point to improve sustainability performance since this will result in lower risks for the financial institutions that provide debt and equity funding as well as insurance to the industry.

### ***Improving Industry Performance***

A wide range of instruments can be classified as voluntary, including company-specific and industry-wide codes and policies, reporting norms, management systems, procurement requirements, and agreements between different actors. Many concerns have been raised about voluntary initiatives, and in particular about the profusion of these instruments being developed. Governments, NGOs, and businesses also retain a healthy scepticism about the efficacy of voluntary initiatives for addressing ‘difficult’ measures of performance. This scepticism stems in part from the lack of assurance of performance gains and unclear public accountabilities in some voluntary programmes. There is growing recognition of the need for transparent design processes, clear measures of performance, and good accountability mechanisms.

***Industry Codes and Charters.*** The principles of corporate social and environmental policies have been adopted and incorporated into a common framework by national mining associations in Australia, Canada and South Africa. At the international level, the

International Council on Mining & Metals (ICMM) has a Sustainable Development Charter that is an international code of conduct for the mining and metals industry. There is no clear evidence that it has yet had direct impact on company performance. Member companies are not required to adhere to it, and it does not provide for verification or for public reporting. Only a relatively small portion of the industry, mainly the largest international and national companies, has actively supported the charter. Nevertheless, it could provide the basis for the development of a more detailed Sustainable Development Code for the sector.

**Certification Schemes.** Companies can seek certification to demonstrate to interested stakeholders that their activities, products, or services meet the requirements of a particular recognized standard. Certification schemes can be product-, process-, or site-related. While some standards allow companies to self-certify (such as ISO 14001), many management systems and product standards require independent verification. Certification by an independent third party is perceived to be most credible. Companies will pursue third-party certification only if there is an adequate business case supporting the decision. A high level of consumer awareness of what certification to a standard means is essential for the broad success of such programmes.

**Corporate Reporting.** Many mining companies now prepare voluntary annual environmental reports for public release. There is no consistent or harmonized approach, and companies retain total discretion. Social reporting is more recent and occurs infrequently. Information about non-compliance and non-performance incidents should be reported alongside achievements, and the information should be verified by a third party.

**International Guidelines.** A number of international organizations have produced guidelines that are relevant to or specific to the minerals industry. The World Bank Group has produced *Pollution Prevention and Abatement Handbook* containing a number of sector specific guidelines. Through the Environment Division of the International Finance Corporation (IFC), it has also produced a good practice manual, *Doing Better Business Through Effective Public Consultation and Disclosure*. UNEP has produced a series of guidelines including *Monitoring Industrial Emissions and Wastes*, *Environmental Management of Nickel Production*, and *Environmental Aspects of Selected Non-Ferrous Metals Ore Mining*. The World Health Organization has produced *Guidelines for Drinking-water Quality, Health Criteria and Other Supporting Information*. The IFC has also produced two manuals of good practice, *Doing Better Business* and *Investing in People: Sustaining Communities through Improved Business Practice*.

### **Overcoming Governance Challenges**

**Ensuring Balanced Governance.** Prevailing governance structures continue to reflect imbalances in the power between different actors and in the priorities given to certain interests at the international level. In particular, minerals development has in the past decades become the province of the investor, often foreign. Moves to provide clear rules and predictable results for mining investors and lenders should proceed hand in hand with similar rules and fair processes to deal with other concerns, such as national interest and community issues.

***Building Capacity.*** Many of the issues discussed in this report relate to poor governance. This results from many factors, including a lack of resources and capacity, power imbalances, a lack of political will, a lack of coordination and integration, or a lack of representation of stakeholders in decision-making. It is important to focus on capacity building for different actors in the sector, especially on strengthening the capacity of national and local governments to design and enforce regulations.

***Strengthening Institutions.*** In some cases, existing governance structure fails to effectively and efficiently resolve issues and enforce the legislation due to bureaucracy, dictatorship, lack of accountability and transparency, or corruption. At an extreme, poor governance can go hand in hand with abuses of human rights and conflict between different actors.

***Building on Existing Initiatives.*** Efforts are needed to avoid the proliferation of competing schemes – norms, standards, guidelines and criteria for the mineral sector. This emphasizes the need to work with other organizations and interest groups and puts a high premium on building on existing and well-functioning initiatives.

## **Part IV: Agenda for Change**

The many people and organizations who together constitute the minerals sector have differing roles, perspectives, and values. The Agenda for Change focuses on areas where there is some convergence.

### ***The Minerals Industry***

Making a competitive return on investment is a primary objective of business. Doing this in ways that are more responsible, transparent, and accountable, is important for establishing public credibility but it is also essential for assisting Boards of Directors and senior management to identify potential strategic and financial risks and opportunities. Companies in every part of the minerals industry can use sustainable development concepts to find better ways to meet their business objectives.

### ***Individual Company-Level Actions***

#### ***Develop and Adopt a Sustainable Development Policy***

This is a first step for a company. It can be used to create internal change and to integrate sustainable development into mainstream company thinking in ways that add business value. The sustainable development policy can incorporate other relevant corporate policies such as those on environment, worker health and safety, community relations, and public reporting.

#### ***Review End-of-life Plans at Existing Operations***

Companies should conduct a comprehensive review of existing plans for eventual closure of their key facilities. The review should focus on whether existing plans fully address the desired post-project results including end-of-life environmental conditions, economies of affected communities, opportunities for displaced workers, social conditions, and impacts on government at all levels. This process can also be useful to companies in surfacing potential future liabilities and developing strategies for managing them. The company should facilitate discussions among principal actors in the community to develop a shared vision for the future and an allocation and sharing of responsibilities.

#### ***Community Sustainable Development Plans (CSDP)***

A company's investment in any community – particularly when there is a weak government presence – creates an opportunity for development. There must, however, be a framework that allows actors in the community to develop a shared vision of where the community is going to capitalize on that opportunity, while avoiding potential problems. This can also be a mechanism for making trade-offs needed for sustainable development. A CSDP should provide the fundamental framework for the roles and responsibilities of the company, the community, government, and other parties. A company should facilitate and promote the planning process but not lead it.

## ***Joint Commitments – Industry***

An individual company can achieve benefits by pursuing policies consistent with sustainable development; still more can be achieved by working together. This does not mean less competition, but better competition.

### ***A Declaration on Sustainable Development embodying a commitment to a Sustainable Development Code***

The Declaration, and subsequent Code and guidelines are intended to complement, not replace, other priorities and initiatives identified elsewhere in this Report. The proposal is to simplify the current multiple codes and sources of guidance, by providing a way to bring these together over time into one management system. It should build on the ICMM's Sustainable Development Charter as a starting point. The process of developing a Declaration – and then a Code – for the sector could take place in three phases: developing and signing the Declaration; establishing a fully articulated Code for individual minerals facilities or projects; and, establishing an expanded, company-wide Code system.

While ICMM might have a key role in developing the language of the Declaration and a subsequent Code, companies not choosing to join ICMM should be encouraged to adopt them.

### ***A Complaints and Dispute Resolution Mechanism***

The Declaration should be accompanied by a complaints and dispute resolution mechanism which brings parties together, in a neutral forum, to attempt to work out a mutually acceptable settlement. The mechanism is envisioned as being similar to the methods and procedures of an ombudsman such as the Compliance Advisor/Ombudsman of the International Finance Corporation, or the Mining Ombudsman Project that has been operated by Oxfam Community Aid Abroad in Australia.

### ***A Program for Integrated Materials Management and Product Stewardship***

Industry needs to collaborate with regulatory authorities, downstream users, and other groups to develop sound, science-based means to ensure safe use, re-use, recycling, and eventual disposal of its products. A Product Stewardship Initiative could promote greater exchange of information and integration of views with the industry's principal customers and intermediary processors, recyclers, and others. This initiative could build on the work already undertaken by the Non-Ferrous Metals Consultative Forum on Sustainable Development.

### ***A Sustainable Development Support Facility***

Such a facility could play an important role in managing emergencies and building the capacity to prevent them. It could mobilize experts to supplement government capacity to assess, respond to, and control accidents and emergencies, or to help make sure that threats do not become actual emergencies.

The Facility could be developed with industry participating simply as one stakeholder, with aid agency funding. Alternatively, industry could take the lead in establishing the facility, and encouraging it to grow with broader roles supported by others. It would probably

require one or two permanent staff and would build contacts with governments to ensure they are aware of its services, and maintain a register of experts who commit to responding at short notice. Once established, the Facility could seek funding from a variety of sources and develop additional roles.

## **Labour**

Labour has a critical role to play in assisting the sector to improve its contribution to social and economic development objectives, in relation to workers in the industry and affected communities more broadly.

### ***Labour and Industry Agreement on Sustainable Development***

There could be a global-level agreement among labour federations representing workers in the minerals sector and industry organizations for broad cooperation in support of sustainable development. Organized labour could take the lead and suggest elements of that agreement.

### ***Community-Level Cooperation***

Labour could be central in community-level processes: reviewing end-of-life plans and designing community sustainable development plans. Where there is no company leadership in initiating the processes, labour should consider taking such a role.

## **Governments**

The governments of some countries have played major roles in setting up provisions for some of the efforts described above, while others have not. The latter may lack the economic resources or capacity to lead these processes effectively, the regulatory framework or policies, or the political will.

In seeking to ensure that the opportunities presented by mineral investment are transformed into sustainable development, it is important that governments develop a strong policy and regulatory framework.

### ***Review of Legal and Economic Framework for Sustainable Development***

Countries with significant mineral development could consider a comprehensive and open review of their legal frameworks and their impacts on sustainable development. While the review should be respectful of the need for investment, it should focus on how to turn this investment into opportunities for sustainable development.

### ***Integrated Closure Planning***

Governments could introduce a legal requirement for mine closure planning. This would need to indicate (1) what opportunities the minerals development will provide; (2) where communities and the broader society will be at the end of the cycle; (3) the steps needed to capitalize fully on the opportunities provided by the project and to move forward to a post-project vision of sustainable development; and (4) who can and will provide the missing components?

### ***Financial Surety***

Governments need to find means of guaranteeing financial surety. Mines and minerals processing can impose large social costs and leave substantial environmental legacies. If managed well, this should not be the case. Some governments insist on bonds or guarantees that industry will comply with closure plans, insuring that costs can be covered if company fails.

Many developing countries have not followed this route, for a variety of reasons. Small and medium companies would find it difficult to provide a realistic guarantee, provoking fears that they would close and a source of employment would be lost. Also, expensive guarantees and additional procedures are seen as a disincentive in newly-created liberal environments. There is a need to find methods of capturing the benefits of financial surety that can also overcome these problems.

### ***Sustainable Development Support Facility***

MMSD has found that in the opinion of some, such a Facility should be completely independent of industry. This would ensure that governments and others can fulfil their role as industry-independent authorities, part of the regulatory system. This is an attractive alternative. However, if industry is not to be involved in its creation, who will assume the responsibility to establish and run such a facility? Is the idea sufficiently attractive to aid donors that they would provide it with the modest funding it would require?

The on-going legacy of mining and smelting operations that operated decades or centuries ago is a daunting issue, but improving conditions at abandoned sites can yield immense environmental and social benefits for a relatively small investment. Once it is clear that the social or environmental problems at sites that are no longer operating is a public rather than a private responsibility, then funding becomes a responsibility of governments. Finding the funding for such rehabilitation is an enormous challenge.

### ***Abandoned Facilities and Rehabilitation***

A process could be created, similar to the Global Environment Facility, which could provide governments with resources and technical support to deal with abandoned mines. Governments with many abandoned mines but few resources could be given grants to determine priorities for the cases most urgently needing attention and to develop project proposals that could then be funded.

The fund would approve applications, with priority being given to projects where the environmental legacy has been identified as most problematic and clean-up will offer the greatest benefits. Further, the focus would be on low-income countries where rehabilitation could generate employment, or where there are particular social legacies of former mine sites or mining communities. Governments and companies could raise the profile of such a proposal by ensuring that it is discussed and debated at the Global Mining Initiative meeting in May 2002.

### ***Identifying Gaps in Capacity***

The government bodies responsible for managing the impacts of minerals development – social, economic, and environmental – must have adequate resources. A complement to any

review of national legislation could be a review of the resources available to the various bodies charged with managing mineral investment.

## **Other Actors**

### ***The World Bank***

The World Bank has strong links with governments in both developing and industrial countries. Their Operational Guidelines and safeguard policies have become the norm for the finance industry. Any successful strategy to establish more widely applicable criteria must start by building on these. A process to agree a mining-specific supplement to the Bank's safeguard policies could be established, open not just to World Bank entities but also to regional development banks, ECAs, investment guarantee agencies, commercial banks, insurers, other financial institutions, and other stakeholders.

#### ***Support for National Reviews of Policy Framework***

Countries could undertake reviews of the adequacy of their policy frameworks to ensure that investment is catalysing development effectively. Efforts towards legal or institutional reform could be based on concepts emerging from these reviews.

#### ***Benchmarks for Capacity Building***

While the World Bank has been supporting capacity building in this sector, it would be helpful to develop a clearer picture of the kind of capacities needed and those that are already in place. The Bank is well placed to work with its member governments and others to develop a clear vision of what these capacities should be.

#### ***Sector Specific Guidelines***

It is suggested the World Bank could clarify, particularly in its submissions to the review panel of the Extractive Industries Review, its willingness to look for broader engagement with all elements in the sector to develop a sector-specific supplement to the existing Operational Guidelines that would address some of the issues that relate specifically to mining projects. This supplement might include reference to the issues of financial surety for closure costs, and the stipulation of Community Sustainable Development Plans in those projects funded by the International Finance Corporation or other World Bank entities.

#### ***Surety for Closure Costs***

The World Bank has examined the benefits of financial surety for environmental and social costs of closure in this sector, and how to incorporate the requirement for surety into loan agreements for mining ventures. The Bank could play an important role in convening discussions of the feasibility and desirability of an agreement among the major lenders in this area to establish a joint set of guidelines for guarantee of end-of-life obligations.

#### ***Small-Scale Mining***

Since the World Bank is experienced in community and national development processes, it could assist ASM-related issues through, for example, its continuing support of the

Communities and Small-Scale Mining Initiative, and through assisting governments to develop policy for ASM.

## **Commercial Lenders**

### ***Assure Availability of a Fair Dispute Resolution Mechanism***

Commercial lenders could require that an effective dispute resolution mechanism would be available to affected people and organizations as a condition of loans.

### ***Support for Industry Code***

If the proposed industry Declaration and Code are adopted, commercial lenders could support them as a means to the better management of risk. The Declaration and code could be recognized appropriately in credit decisions, and they could lead to more efficient approval processes, or to more favourable interest rates and other terms.

## **Insurers**

### ***Support for Industry Code***

The insurance industry could participate in the development of the proposed Declaration and Code, to ensure that it will effect lower risk levels, then provide incentives to companies that adopt the Declaration and Code.

### ***Support for the Sustainable Development Support Facility***

The insurance industry is keen to prevent accidents and emergencies. The proposed functions of the Sustainable Development Support Facility should therefore be of interest to insurers. They could consider whether these benefits merit financial support from the insurance industry, in the way that this industry has supported other collective risk-reduction organizations in the past.

## **Equity Investors**

Equity investors may want to evaluate the extent to which company participation in the proposed Declaration and Code are likely to be relevant to investor risks and share value. The code is designed to begin with individual facilities but later become company-wide, much as the ISO system has in some companies in the past. As it does so, it increases in relevance to investors.

## **The United Nations Foundation and United Nations Organizations**

The United Nations houses the Global Compact, a developing initiative for cooperation between the private sector and other interests in world society. The proposal for an industry Sustainable Development Code could explicitly link the minerals industries to the Global Compact. Specialized organizations of the United Nations system, including the United Nations Development Programme, the United Nations Environment Programme, the United Nations Conference on Trade and Development, and the International Labour Organization, have unparalleled contacts with UN member governments as well as useful expertise for assisting in developing government frameworks for sustainable development. If a 'joined up' approach can be achieved among UN funds and agencies, this can help

facilitate a more coherent approach from governments – policies for sustainable development that cut across ministries and departments.

A pivotal role in getting to the desired result could be played by the United Nations Foundation. It is hoped that the UN Foundation could convene the various UN organizations to outline a ‘joined up’ approach to articulation of a sustainable development framework and provide resources to launch a credible if modest programme to achieve these objectives, which could then attract support from other donors.

### ***The Role of Non-Governmental Organizations***

Civil society includes a varied set of actors, including human rights, environmental and community-based groups, policy institutes, churches, and charities. They ensure a diversity of views are heard in decision-making and are critical as sources of aid and means for its delivery.

#### ***Support for Sustainable Development***

There is a greater likelihood that NGOs will achieve progressive change if they can demonstrate that they have considered the values and views of other stakeholders. An NGO can enhance the sense that it is approaching issues from a balanced perspective by adopting a policy that endorses sustainable development and explains how the organization intends to contribute to it.

#### ***NGOs as advocates***

The internet and the information revolution have opened up significant opportunities for more effective campaign work by NGOs, but they have also created challenges and risks. The challenges include pressure to digest ever increasing amounts of information about issues of which the organization has no direct knowledge. The risks are an increased possibility of being enlisted in a campaign on the basis of mistaken facts and assumptions. An NGO can help protect itself against these risks by developing a clear policy of investigation and assurance to be applied to the information it receives before it is endorsed. A number of the human rights organizations have such policies.

#### ***NGO Performance Monitoring***

The effectiveness of any single organization is affected by the reputations of others in the same community of interest. Leadership in the NGO community could consider a jointly developed performance standard that is acceptable to broader society and can be verified. This requires collective action, but would enhance the position of NGOs.

#### ***NGOs as Service Providers***

If the world is to follow development strategies based on private investment, those interested in development will interact with investors. NGOs’ value relies heavily on their independence, and, for some, interaction with the private sector is an undesirable compromise. The key challenge is to develop models that clearly preserve independence, while seeking ways to participate in the development process based on private investment.

## ***Educational and Research Institutions***

There is a fundamental need to rethink how the curriculum for mining professionals can incorporate a solid grounding in the complex economic, social, environmental, and governance issues of sustainable development. To be effective in this endeavour, faculties will also have to ensure that sustainable development thinking is incorporated into the general curriculum. Research institutions could examine the opportunities that sustainable development presents, and how to take advantage of them, for the benefit of society.

## ***Specific Initiatives Involving Multiple Actors***

### ***An International Indigenous Organization***

In the first workshop held by MMSD on indigenous peoples and mining, it was suggested that an international indigenous organization be established to direct, advise and monitor industry performance in the arena of relations with indigenous peoples. With the help of governments and the international community, this organization could oversee the implementation of a set of core principles on relationships with indigenous peoples.

### ***Protected Areas and Mining Initiative***

Current systems of decision-making regarding mining and the conservation of protected areas could be improved. This requires the active involvement of conservation agencies, government, and mining companies, as well as possible collaboration with oil and gas companies, to develop a package of published 'best-practice' guidance, and to deal with a variety of related issues.

### ***Reporting guidelines***

A consistent system of reporting guidelines should ensure that key aspects of company practice are publicly reported and inform stakeholders about corporations' performance and major projects. This requires the development of a reporting system and performance indicators, which should also allow for innovation and differentiation at the level of specifics.

## ***The Process from Here***

The forthcoming Global Mining Initiative Conference in Toronto in May 2002 has significant potential for driving the debate forward in constructive directions. It could serve (1) to establish priorities for industry actors based on engagement with others, (2) to set some initial guidelines for processes directed at specific issues, and (3) to help define the next steps.

The forthcoming World Summit for Sustainable Development will be an important opportunity for focussing attention on sustainable development; it is being hosted by a country that is among the world's leading mineral economies, in a city built on minerals development. There will be few better opportunities in our lifetime to raise the role of the mining, metals and minerals sector in sustainable development before a more interested audience. The opportunity should not be lost.

## ***Is Something Missing?***

There has been great difficulty in establishing effective dialogue and maintaining it once established. There are many different agendas, and everyone wants to start with a different priority. It is impossible to deal with all the issues at once.

### ***A Forum on Minerals and Sustainable Development***

A Forum on Minerals and Sustainable Development could be established. It would not need a permanent bureaucracy. It could simply resemble the upcoming Toronto Conference, but in a more advanced version, at determined future intervals. It could be a place for establishing priorities. It could set guidelines for processes directed at individual issues. It could endorse those processes and their results, ensuring that the principles which evolve are more quickly incorporated into company policy, industry codes, best practice guidelines, lending policies of banks, as well as laws and regulations.

Whatever the reaction to this suggestion, it is clear that moving forward would be aided by a structure of some sort. If the mining and minerals sector does not maintain permanent, meaningful and frequent dialogue among all key actors, it will not progress. This goal might be summarized in Table 2:

<b>Table 2</b>	
<b>FROM</b>	<b>TO</b>
Partial dialogues among a few actors	Increasingly inclusive dialogue, that engages ever-broader circles
Accidental dialogues, that occur by chance	Intentional dialogues, deliberately planned and pursued
Short-term discussions that flourish but then die	On-going engagement for the long term

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The MMSD project actively encourages all interested people or organizations to comment on this Draft Report. The more thoroughly these ideas are tested, the better the results will be. Comments will be accepted through 17 April 2002.