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An Asset for
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M I N I N G A N D D E V E L O P M E N T

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**WORLD BANK AND
INTERNATIONAL
FINANCE
CORPORATION
2002**

ACKNOWLEDGMENTS

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International Finance Corporation
2121 Pennsylvania Avenue, N.W.
Washington, D.C. 20433
USA
www.ifc.org/mining
www.worldbank.org/mining

"Mining and Development" is published by the World Bank Group's Mining Department. *An Asset for Competitiveness: Sound Environmental Management in Mining Countries* was written by Monika Weber-Fahr, Craig Andrews, Leo Maraboli, and John Strongman in the Mining Department. The paper has benefited from comments by Peter van der Veen, David Hanrahan, Didier Fohlen, and John N. Middleton. Contributions were also made by Clive Armstrong, Christopher G. Sheldon, and Ramanie Kunagayam. Parts of this paper were presented at the OECD Global Forum on Foreign Direct Investment and Environment in February 2002 in Paris.

This is the third in a series of short papers that the World Bank Group's Mining Department is publishing to share some of the experience and knowledge gained through daily work with developing country policymakers, the mining industry, and mining communities and their organizations. Over the coming years, as the sector expands, governments, businesses, and communities in many developing countries will face more and more complex issues and difficult trade-offs. We hope to see the "Mining and Development" series inform a wide range of interested parties on the opportunities, as well as the risks, presented by the sector.

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FOREWORD

How worthwhile is it for mining countries to invest in setting up systems for sound environmental management? A number of trends and examples suggest that countries can enhance their attractiveness for foreign investors by establishing stable and reliable frameworks and competent institutions to manage the environmental dimensions of mining.

Mining companies have less and less reason to be concerned about the direct costs of managing the environmental aspects of their mining activities. In fact, the better they manage environmental matters, the more successful financially they tend to be. Even if things do go wrong on the environmental front, the most serious problem for a mining company is usually not the technical solution for mitigating an emergency; technical solutions are by now usually feasible and manageable.

The more substantive costs arising from an environmental impact problem a mining company may have caused, advertently or

inadvertently, will often be the damage to its credibility – and the resulting erosion in trust. This can prevent the company from successfully addressing the mitigation of the problem – simply because local communities and authorities involved will have no trust in any action undertaken or compensating measure offered.

Such damage can lead to substantial social and political consequences, which in turn can be very costly to mining companies' business. To help them avoid such problems, mining companies look to governments to provide clear, stable, and transparent frameworks for environmental management — especially with regard to monitoring and enforcement systems.

In the worldwide competition for attracting foreign direct investment, clear environmental frameworks and competent institutions thus play an increasingly important role. Mining countries in particular are well advised to decide in favor of establishing sound environmental management systems and ensuring that these are used and respected.

*James Bond
Mining Department, World Bank Group
May 2002, Washington D.C.*



An Asset for Competitiveness:

Why Sound Environmental Management Is Increasingly Important in Mining Countries

Mining operations across the world are easily recognizable. By the very nature of what mining means – digging, removing soil and overburden, and separating out ores and non-metal minerals – these operations leave behind environmental “footprints”. Such “footprints” can have a number of different effects – at worst seriously limiting the ability of surrounding communities to earn and sustain their livelihood, particularly in areas where communities rely on their natural environment to provide food, shelter, transport, and other opportunities.

At the same time, more and more new mining operations take place in developing countries where institutions and systems vary immensely in their ability to regulate, manage, and monitor the environmental impact of mining operations. At times, large mining companies have been suspected of seeking “pollution havens” to conduct their business. In reality, however, there is no evidence to substantiate such claims.¹ In fact, in an increasing number of cases, large mining companies have been the driving forces behind the build-up of environmental management systems in developing countries. In Chile in the early 1990s for instance, while the country was still developing its legal and institutional frameworks, large mining companies committed to substantive voluntary agreements regarding environmental performance. These agreements set standards for and provided inputs to the

¹ See Remy and MacMahon 2002.

SOUND ENVIRONMENTAL MANAGEMENT IN MINING COUNTRIES

development of the national system of environmental management in the sector.

Indeed, the quality of a country's environmental management system is becoming a key asset in the competition for foreign direct investment – mostly because large mining firms are learning that the social and political consequences of environmental damage, caused by careless operations or by accidents or spills, can be extremely costly for their business. They have seen the financial performance of mining projects affected by a plethora of such events, and by the subsequent problems with adjunct communities. In managing the environmental dimension of their mining projects, these firms increasingly look for competent regulators and efficient institutions that understand the importance of clear, stable, and transparent environmental frameworks.

The costs of *not* setting up well-designed legal frameworks for environmental management – and functioning institutions to implement them – can be massive, as mining operations leave behind larger environmental legacies than they otherwise would have, with no responsibilities attached. Examples can be found in countries such as Ukraine and Romania in Eastern Europe, Zambia and South Africa in southern Africa. Malfunctioning environmental regulations and institutions can also be a source of serious corruption and fraud, and they can work contrary to what originally was intended, *increasing* environmental risks and massively *decreasing* the sector's attractiveness vis-à-vis foreign investors.

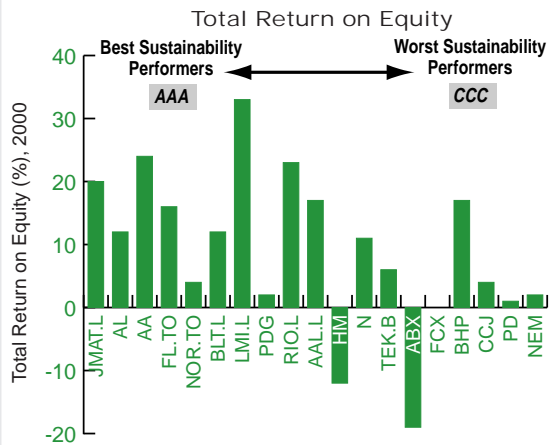
Financial Success for Mining Firms: Linked to Environmental Performance

Few other industries face similar challenges in terms of historical environmental liabilities, rapidly evolving global environmental conventions and treaties, and ever-shifting compliance requirements and obligations with regard to local communities (for example, concerning land tenure issues, information and consultation, and local economic development). Not only are the targets moving, but the substance is also becoming more complex as environmental, social, and economic issues in the mining sector have become increasingly interlinked over the past two decades or so.

It is thus not surprising that mining firms find that their financial performance can be significantly improved through competent environmental management of their operations, by ensuring smooth processes, avoiding accidents, saving energy, and conserving the use of raw materials. The top environmental performers in Innovest Strategic Value Advisors' annual survey of the global metals and mining industry posted accumulated returns that were over 60 percent higher than those of environmental laggards over a three-year period, and 10 percent higher over one year.² Total per share returns on equity and earnings growth were also found to correlate positively with environmental leadership (see Figure 1).

² Innovest's annual survey assessed the performance of 21 of the world's leading minerals and metal companies in such areas as environmental management, resource usage, climate change, mine decommissioning, and sustainability-related opportunities in new markets.

FIGURE 1. Financial and Environmental Performance of Mining Companies



Source: Innovest Strategic Value Advisors 2001.

What makes the relationship between environmental and financial performance stand out in the metals and mining industry, the report emphasizes, is the extent to which environmental and social issues influence the bottom line. Expenditures relating to energy consumption, mine closure, waste management, and spoil mitigation are becoming increasingly relevant to company profitability.

Environmental Risks and the Influence of “Watchdogs”

Not only have environmental issues become more complex and substantive over the past decade or so, but they also have received more attention on the international level. Progress in information technology and greater access to communication systems have resulted in an unprecedented degree of networking among civil society groups in developing and developed countries. Increasingly, and with unprecedented speed, many of the latter have taken to being

advocates of the former's interests. Nothing can produce quite the same negative impact on a mining firm's reputation as news of an environmental disaster, incident, or accident – publicized in real time and in graphic detail in the developed world's media, irrespective of where it took place.

The increased interest also spurs ever-changing *expectations* regarding standards and performance. The expectations of local communities, national governments, and others about the effectiveness of the industry in addressing environmental concerns have risen significantly over the last decade, and they are reflected in changing policies, regulations, and best practices. Mining companies are experiencing increasing uncertainty regarding the planning and implementation of their projects. What is valid today, in terms of required measures and steps on environmental performance, can change tomorrow. What is acceptable today might incur high fines tomorrow.

The stakes for mining firms are getting higher. Ultimately, they risk losing their social and political “license to operate” – the unspoken agreement and understanding with civil society, both on the ground and in the realm of international politics, that a particular operation is desirable and should be supported, rather than actively opposed. Losing this license to operate can have dire financial consequences, ranging from falling share prices to loss of access to capital.

Many companies have reacted to uncertainties evolving from rapidly changing environmental standards by committing themselves, on their own account, to higher standards than might currently be required

by their host country. Stability of rules is becoming key. Every country that demonstrates its commitment and ability to set appropriate and reliable environmental rules at acceptable international standards, and to monitor these standards in a credible way, will stand out to investors, providing a stable framework that permits the management and planning of risks associated with the operation.

Mining Companies: Only a Limited Role by Themselves

The environmental risks of mining operations are well documented and include removal of soil and forest canopy; soil, air, and water pollution, including impacts on global warming³; and the destruction of fragile ecosystems and diminished biodiversity.

In the past, mining operations have sometimes wreaked significant damage on the environment, leaving unfortunate legacies that may need extensive programs to remedy – if they are reversible. Over the past 20 years, however, the industry has increasingly recognized the need and obligation to identify and mitigate the adverse environmental consequences of its activities.

The technology and knowledge needed to minimize or eliminate adverse impacts exist and are in practice in many cases. Most of the major companies today recognize the need for careful adherence to available

³ Methane seepage from coal mines not only can cause local environmental damage, but can contribute to global warming.

BOX 1. METHODS MINING FIRMS CAN USE TO CURB ENVIRONMENTAL RISKS

Mining firms have a variety of instruments and processes they can use to manage, minimize, and mitigate environmental risks, including:

- ▶ Establishing clear guidelines for operations;
- ▶ Completing thorough environmental impact assessments (EIAs) and associated action plans;
- ▶ Consulting with stakeholders at all phases of operations;
- ▶ Following procedures for identifying liability and appropriate compensation in cases of harm;
- ▶ Preparing, jointly with relevant stakeholders, an initial closure plan at the time of project approval and updating it on a regular basis during the life of the project;
- ▶ Providing the necessary resources to fully implement the closure plan;
- ▶ Clarifying and establishing – in partnership with communities and government agencies – post-closure monitoring and supervision, as needed.

standards and, in most cases, successfully apply them (see Box 1). Remaining challenges for the private sector arise mostly from:

- ▶ Limited capacity, mainly among smaller mining firms, to apply and continuously follow up on evolving environmental best-practice.
- ▶ An increasing tendency among many mining firms to outsource significant parts of their operation, and the often slow follow-up in obliging subcontractors to

adhere to environmental performance standards.

- ▶ The need to *internally* enforce and follow up on environmental performance standards throughout the many years of a project's life. Enthusiasm and diligence of even the most dedicated staff can dwindle, the longer a project is under operation.
- ▶ The need to gain – and maintain – the trust of the local community. Particular efforts are required in making people understand risks that they often cannot see, smell, or feel, in a language they understand, rather than in the technical jargon usually applied in the analyses used for assessment and monitoring.

The Challenges of Designing the Right Environmental Laws and Regulations

When governments examine and possibly redesign laws, regulations and direct agreements with mining companies, as well as proactive policy interventions regarding environmental issues, it is important that they take the realities of their specific context into account. Although good models for regulatory frameworks exist in a number of industrialized countries with large mining sectors, it must be remembered that these have typically developed over many decades. Developing and transition countries often face a very different starting point because of overall weak legal systems, poorly functioning or non-existent institutions, and limits in the availability of skills and human resources. In addition, the environmental and ecological conditions may differ from those in which many mining frameworks evolved, particularly in relation to working in areas with high rainfall and/or tropical conditions or specific biodiversity issues.

In order to avoid setting the wrong incentives, environmental administration of the mineral sector should be part of a wider national environmental management system, with established policies, legislation, and enforcement procedures. Mining-specific issues can then – if needed – be integrated in special laws and regulations (see Box 2). The main elements of such a system are:

- ▶ Development of an environmental policy, including the establishment of goals and the formulation of strategies for achieving them;
- ▶ Elaboration of a national environmental action plan (NEAP) for all business sectors, promulgation of an “umbrella” environmental law, and enactment of sector-specific laws and regulations;
- ▶ Establishment of goals for the environmental quality of different ecosystems, and standards for industrial emissions to the air, effluents to water bodies, and solids discharges;
- ▶ Establishment of public institutions responsible for environmental management and law enforcement;
- ▶ Adequate training of personnel in environmental management;
- ▶ Dissemination of environmental knowledge and information, particularly among public agencies and institutions;
- ▶ Encouragement of public participation in environmental matters, in particular among local communities, by providing opportunities for participation tailored to these communities’ needs and capacities.

All these elements have a bearing on the mining industry, although to different degrees and with large differences among

countries. The methods employed for achieving the goals will vary considerably and will depend on local, natural, socio-economic, and cultural conditions.

BOX 2.

ARGENTINA: FROM HODGEPODGE TO STREAMLINED PROCESS

In 1997, the federal government of Argentina, supported by the World Bank, streamlined its previous mix of federal and provincial laws and regulations applicable to mining by passing a National Mining Environment Law. The law requires full and complete environmental impact statements and mitigation plans in order for permits to be issued. The importance of uniform requirements for environmental permitting of mining projects cannot be understated. At the time the law was passed, Argentina was undergoing a boom in both exploration and mining development. The new national law helped companies by streamlining the permitting process, thereby removing some of the discretionary behavior on the part of provincial authorities that had delayed projects. This also eliminated discriminatory treatment of operations, depending on their location. At the same time, the federal government undertook an innovative environmental data management project to collect and synthesize air, soil and water baseline information in prospective mining areas. This provided companies with ready-made information and, more importantly, set baseline ambient standards against which mining projects could be monitored.

Under all circumstances, however, it remains essential to have a *process* of gradually establishing:

- ▶ The legal basis for environmental control
- ▶ Basic institutional responsibilities and resources
- ▶ The essential regulatory framework
- ▶ Monitoring and enforcement procedures, including public disclosure, and
- ▶ Adequate operating resources (staff and budget) to address priority issues/areas.

The foundation of a successful system is to achieve some clear results initially. This will assure the public and investors that at least the most critical problems are being addressed.

Much of the success of environmental legislation and corresponding regulatory frameworks can depend on the details and the appropriateness with respect to a given country. In some Central Asian countries, for example, the long legacy of environmental damage stands in stark contrast to the body of very strict environmental legislation, which fails to take into account the given situation by differentiating appropriately between pollution *stocks* and pollution *flows* (see Box 3). Further complications arise where regulations tend to measure “end of pipe” pollution, rather than the actual impact on the environment. In the absence of appropriate capacity for monitoring and enforcement, the contrast between the demands of legislation and the reality of business has given rise to corruption and embezzlement.

There appears to be a need, in many cases, for a more structured approach for discussing and understanding some of these complex issues. The real focus of

BOX 3. CENTRAL ASIA: REGULATIONS THAT ARE TOO STRINGENT CAN LEAD TO CORRUPTION

In Kazakhstan and the Kyrgyz Republic, many mining operations bear extensive legacies of past environmental abuse. The eventual cost of clean-up and rehabilitation of these operations will be substantial. To complicate matters, the mining industry, in existing and new operations alike, labors under environmental regulation, norms, and standards that are neither internationally competitive nor compatible with the actual conditions of mining in the country. The basic norms and regulations were derived from those in use in the former Soviet Union and are, in the main, based on “end of pipe” measurements. These standards are sometimes so strict (in fact, in many instances stricter than West European standards) that they are unattainable for enterprises operating with antiquated machinery. It thus makes economic sense for enterprises to pay fines or bribe inspection officials to continue to exceed pollution standards and avoid investing in new equipment. In addition, the legislation does not incorporate the notion of “sustainability.” Concepts common in other countries, such as partnership, transparency, disclosure, and revenue-sharing among levels of government, are not well developed in Central Asia.

interest for most parties is the specific mining operations or investment opportunities. Unfortunately, less attention

is often given to the context and to the institutional framework that govern the final shape of such operations. There is frequently a need for independent analysis and advice on legal and regulatory issues and for structured review of the environmental and social issues in the sector at large or in a specific region. A variety of tools are available for such work, including analytical studies, various types of consultative approaches, and Strategic Environmental Analysis. Such work, however, requires both the commitment of the decision-makers in the sector and the allocation of resources, both of which can be difficult to obtain.

The good news is that essentially all developing countries to date have developed National Environmental Action Plans (NEAPs) or related or equivalent country strategies, and have pursued follow-up activities that have helped put in place legal frameworks and related institutional mechanisms. The challenge now is to ensure availability of human and financial resources for the implementation of these strategies and frameworks, and to find pragmatic solutions that take into account limitations in resources and capacity where those might persist.

Implementation: Building Institutions Is the Key Challenge

Drafting and passing appropriate environmental legislation is not easy. Yet there is a bigger challenge: Establishing and staffing institutions that can write practical regulations and can implement, monitor, and enforce laws and regulations. In this context, one of the most important issues for a country to decide is whether to pursue a sectoral approach to environmental

management or an integral one. Usually, the integral approach is the preferred solution, establishing an environmental governance institution (EGI) that is not tied to a specific sector and that forms part of the overall development planning scheme. In countries that have yet to develop their EGI, however, the sectoral approach, with an environmental office within the Ministry of Mines, provides a practical scheme for the initiation of environmental work, as it allows easy access to technical expertise and a better understanding of the issues involved. Once the basic instruments and procedures are in place, the country will want to move toward an integral or mixed approach, where sectoral offices are coordinated by a national central authority.

Another very difficult practical issue relates to the level at which the responsibility should be located – whether federal or provincial. These decisions are heavily influenced by the particular national circumstances and by trade-offs such as federal institutional capabilities versus local knowledge of the mine and surroundings, and national appropriation of revenues as opposed to fiscal decentralized systems. Often, availability of staff and resources at the different administrative levels decides the outcome of these discussions.

In Latin America, for example, no single conceptual model for managing environmental issues in the mining sector has emerged; instead, a variety of pragmatic approaches have evolved.⁴ In Peru, a country with a strong mining tradition and relatively weak environmental capability, much of the environmental responsibility is located in the Ministry of Energy and Mines (MEM), where there

⁴ World Bank 1996.

BOX 4. PERU: THE NEED FOR INSTITUTIONS THAT ARE COMPETENT AND INDEPENDENT

In Peru, the mining sector in general has complied better than other sectors with Environmental Impact Assessment (EIA) requirements, as well as with Environmental Compliance and Management Programs and Territorial Environmental Assessments. However, there are several instances of potential conflict of interest *within* Peru's environmental management system. One such case occurs between core technical groups within the Ministry of Energy and Mines (MEM). Groups within the same ministry are tasked with promoting the mining sector, while others have the mandate to prevent environmental damage in the sector and to monitor performance. The only entity resembling a national environmental authority, the National Environmental Council, is limited to a very weak, coordinating intersectoral role. This has resulted in a perception by local communities of a conflict of interest at the MEM. Fears are that environmental control is too lax, at the expense of the health of local communities. Consequently, social and political conflicts, such as spills or resettlement issues, have not been able to be resolved through activities by government agencies and have threatened mining companies' ability to obtain mining permits or to continue to run existing operations. Resolving this issue will be a key to further developing the mining sector in Peru.

is considerable relevant expertise. This ensures a knowledgeable and pragmatic approach to environmental issues, but leaves concerns about the country's capabilities for independent monitoring and enforcement (see Box 4). In a country with a strong federal structure, such as Argentina, the provinces have significant responsibility. In ensuring capacity on the provincial level, Argentina, supported by a World Bank loan, embarked on a program that provided training, instituted specific procedures and business processes, and increased logistical support to environmental agencies, all based on the premise that each province must monitor its own area.

Countries have developed different ways of dealing with capacity weaknesses in their institutions. An interesting example is South Africa, which has introduced extensive public consultation processes. To some degree, this has mitigated the government's own capacity limitations in monitoring by extending the involvement of the general public. In general, however, it remains an open question to what extent governments and government agencies can rely on third-party involvement in monitoring – for example, through local organizations and/or accredited independent consultants.

As these examples illustrate, environmental institutions and systems must be designed to work *with* the local structures – not against them. Of course, some level of reform or reorganization may often be needed.

An emerging and potentially very important dimension of the institutional challenge is the commitment of many major international mining firms to sound environmental

BOX 5.

PAPUA NEW GUINEA: A STREAMLINED APPROACH TO ENVIRONMENTAL MANAGEMENT

Papua New Guinea is a small country with excellent mineral potential. It has a new best-practice set of environmental laws and regulations that apply to all sectors. In addition, the government has specific environmental protection requirements and monitoring procedures for mining projects. These are contained in project development agreements that are negotiated between the project sponsor and the government. The project licensing and approval process also includes a decision-making “forum” involving the developer, impacted communities (“landowners”), and all relevant government departments. The process results in a high degree of information disclosure and consultation between the developer and the people affected by the project. Effectively, the country has created a “one stop” approval process, convenient not only for the developer but also more manageable for government departments, which typically have very modest budgets and resources for addressing the impacts of large projects. The process enables social and environmental issues to be closely integrated at the approval stage. A review of the mining sector conducted by independent consultants indicates that mining projects subject to these arrangements have a generally satisfactory environmental performance. (The exception is the Ok Tedi project, which was developed before these procedures were established.)

and social performance, even where the local regulatory system is weak. Such companies accept that some environmental standards should be adopted as a matter of good corporate behavior. Given that these companies often have more expertise and resources than the regulators with whom they are dealing, a cooperative approach can greatly benefit the efforts of local regulators. Where such corporate initiative is combined with the genuine involvement of local communities, there is a much higher probability of finding a broadly acceptable resolution of environmental and social issues related to mining (see Box 5).

Such trilateral approaches to managing concerns in the context of mining operations are currently being developed in a number of places and countries. An interesting pilot program is an initiative called “Business Partners for Development,” supported by a number of companies, Non-Governmental Organizations (NGOs), governments, and the World Bank. The program has accompanied and supported a number of mining companies, governments, and communities as they set up trilateral arrangements for managing a variety of concerns; these processes were studied and analyzed in order to understand better the most promising approaches.

Meeting the challenge of implementation through trilateral cooperation is complicated by huge differences, not only between countries and local communities but also among the various corporate actors. Most major multi-national firms are attempting to work seriously toward improved performance, even where regulation is weak. However, some companies are more inclined to take advantage of weaknesses in the framework. This can lead to public distrust of the sector as a whole.

Specific Issues for Environmental Laws and Regulations in the Mining Sector

Laws and regulations, as well as institutions monitoring and enforcing them, need to be designed with the *entire* cycle of a mining project in mind, including exploration, construction, operation, closure, and post-mine closure. Six issues are particularly important:

- ▶ Land and water use
- ▶ Waste management
- ▶ Treatment and control of chemicals and pollutants
- ▶ Tailings disposal
- ▶ Air pollution, and
- ▶ Noise control and abatement.

Governments will want to monitor whether and how these impacts are addressed and managed with regard to potential risks to human health and the environment, and what plans and actions are taken to mitigate these risks. If mining companies have agreed to follow voluntary codes of practice and to establish related management systems, some questions need to be considered. Do these have international acceptance? Do they go beyond legal requirements? If so, are there any enforcement mechanisms built into the voluntary agreement? Are the different types of safeguards (laws, regulations, policy interventions, voluntary agreements) adequate, and can they be respected, implemented, and monitored? Is there independent monitoring by third parties, or participatory monitoring with representatives of local communities? Can safeguard mechanisms, once established, be used

to market the sector to potential investors (for example, by emphasizing the reduced investment risks and greater operational ease)? If the system of laws and regulations is deemed inadequate, can a *process* be set up that will eventually result in the creation of a system to balance national and regional priorities and circumstances with the need to ensure international best practice?

Often, special regulatory provisions must be made in the case of mine closure. Otherwise, governments might be left with huge bills to be paid covering environmental legacies left behind (see Box 6 next page). A number of questions are relevant: Are environmental responsibilities defined for orphaned sites and for decontamination of the land? What is the definition of closure, reclamation, and clean-up? What is the definition of rehabilitation? Returning disturbed land to the predevelopment state or finding alternative uses for it? What agreements can be reached on the use of land after mine closure, in particular for land rehabilitation? Are safety issues in the post-mine context, such as tailings and dam spills, taken into account in the mine closure plan? Do taxation law and regulations encourage or discourage mining companies to set aside funds for mine closure? What are the arrangements for post-closure monitoring, site stability, and environmental protection?

Ensuring that these issues are covered by the legal and regulatory framework will reduce risks for mining companies insecure about potential liabilities that they might have to cover in the future.

BOX 6.**ROMANIA: THE COST OF PREVIOUS
NEGLECT OF THE ENVIRONMENT**

In Romania, nearly 400 mines were developed between the 1950s and 1989 under its centrally planned system, often with little regard for economic viability or environmental protection. Starting in 1990, Romania has shifted to a more market-based and environmentally responsible system. The country introduced a sound environmental legislative framework with clearly specified compliance standards. Environmental policy and legislation are with the Ministry of Waters and Environmental Protection; permitting, monitoring, and enforcement is undertaken by its Territorial Inspectorates. This provides a modern environmental framework for existing operations as well as for the development of new private sector mining operations. The government is undertaking a mine closure program for nearly 200 mines in an environmentally responsible manner (including four groups of mines being closed with assistance from the World Bank). As production is terminated, subsidies can be shifted from covering operational losses to helping with the environmental and social requirements of mine closure. A sector environmental assessment has identified a large legacy of closed tailing facilities that is now being addressed by the Government. In addition, amendments to the mining law were submitted to parliament in early 2002 to address the mining-specific environmental requirements relating to mine closure, post-mine closure monitoring, and social impacts.

**Biodiversity and Global Warming: What
Role Should Governments Play?**

Remedies for global impacts, such as global warming and biodiversity loss, present a special challenge for governments. The decisions about the options involved (notably, development versus conservation) and the costs of actions needed are local issues; however, the benefits may be largely global. In some cases, it may be possible to obtain the desired results if mechanisms can be established that can find parties willing to pay the local costs needed to gain the global benefits.

In the case of global warming, for example, the Global Environmental Facility (GEF) and the Kyoto Protocol framework are serious attempts to address this issue. The latter envisages the creation of global markets for carbon emissions that would provide investors (including investors in developing countries) with extra revenues for having invested to reduce emissions beyond what narrow commercial or national self-interest would have dictated. Carbon-trading mechanisms could become highly relevant for coal mining, as far as coal-bed methane recovery is concerned. Governments will have to play a key role in facilitating such arrangements.

Increasingly, large-scale mining is reaching some of the most remote and biodiversity-rich ecosystems on earth, driven by growing global demand for minerals and rapidly changing technologies and economics in the mining sector. Until recently, many of these areas were closed to foreign investment and were largely unexplored and undeveloped for minerals and other natural resources. Now, economic liberalization,

privatization of resource extraction, and a general improvement of the business climate for investing in developing countries are beginning to open these areas to an unprecedented level of industrial development. Governments must play a key role here, but work by a number of international organizations and civil society groups toward defining “international biodiversity hot-spots” provides a very interesting context. This work can help governments designate and safeguard areas that they wish to preserve. Still unclear is the question of whether and to what extent the preservation of “biodiversity hot-spots”, if defined globally, should involve payments by the global community to compensate developing countries for a potential loss in economic development if they choose to preserve those spots rather than to develop them. Already, governments are beginning to negotiate with investors about mitigation measures and/or offset investments that can finance support for biodiversity areas that would *replace* or *mitigate* some of the biodiversity losses elsewhere.

Defining Responsibilities: The Task for the Future of Environmental Management in Developing Countries

In establishing frameworks and institutions for environmental management, governments will want to keep the “bigger picture” in mind: Environmental rules and regulations need to be integrated into a vision of a vibrant mining sector that, by attracting responsible private investment, can create a foundation for environmentally, socially, and economically sustainable well-being for local communities and the population at large. In fact, many countries feel that they need

to assess the environmental risks of any given mining project against its potential economic benefits in the surrounding region. Such trade-offs may be present through the entire life of the project – from exploration, development, operation, to closure and beyond. These trade-offs need to be understood and endorsed by all relevant parties, including communities and local governments.

In the past decade, there has been a growing appreciation among stakeholders of the need to work together on environmental issues in the mining sector – issues that no one group can fully deal with alone. Over most of the period, however, the appropriate boundaries of each stakeholder group’s contribution was blurred and remained a source of confusion and tension. Even the definition of “stakeholders” is still not without some controversy; the relative interests, responsibilities, and direct exposure to risk of the various groups covered by this umbrella term vary hugely. Nonetheless, a consensus, albeit incomplete, seems to be emerging regarding potential roles and responsibilities.

GOVERNMENTS. Governments are ultimately in charge of setting the rules by which mining takes place in a given jurisdiction, and their actions will be critical to achieving sustainable benefits for the national economy from the mining sector. Governments must provide strategic direction and the requisite legal, regulatory, and institutional frameworks to pursue social and environmental goals to promote accountability, openness, and inclusion, and to achieve widespread and tangible benefits for the country’s citizens.

LOCAL COMMUNITIES. Local communities will be most directly affected by the environmental impacts of mining operations. Communities' rights can be safeguarded if their concerns are listened to and respected and if they are able to take an active role in understanding and influencing extractive operations. Sometimes, assistance may be needed to increase the capacity of local communities to participate effectively during consultation and in monitoring operations. Increasingly, communities see environmental issues in the overall context of the distribution of the risks and benefits from mining. The sharing of benefits – fiscal and otherwise – through the various levels of government down to the local community would be a way of accommodating such concerns.

THE PRIVATE SECTOR. The private sector is expected to provide the capital, technology, and managerial expertise to run mining operations. It must also comply with all local laws, regulations, and contracts, including those that deal with social and environmental topics, and normally go beyond this where home-country standards, operations in other countries, or internal guidelines set higher standards. Sometimes the private sector is asked to address a whole range of issues outside its traditional mandate. This is particularly the case when local or national governance structures are inadequate. In considering the private sector, the range of potential investors needs to be kept in mind: from the largest international companies to small local companies and even artisanal miners. Capacities, incentives, and priorities may vary hugely and present particular issues.

CIVIL SOCIETY. Members of civil society, including local and community-based organizations, have at times been effective monitors of the impact of mining operations and successful advocates for change effected by government, industry, and international development agencies. They have, at times, won praise for advancing the development agenda and for drawing attention to issues that might have been overlooked or downplayed. Many civil society organizations, including local community-based organizations, are active in implementing policies and programs designed to promote sustainable development and reduce poverty. In the case of mining, NGOs and Community-Based Organizations (CBOs) may sometimes be able to play a role in such areas as the delivery of social services and the administration of project trusts and infrastructure, or capacity building with regard to social and environmental monitoring.

INTERNATIONAL DEVELOPMENT AGENCIES. International development agencies such as the World Bank Group are well placed to support both the government and the private sector by assisting in sector reforms and the preparation of investment frameworks; by providing loans, equity finance, or political risk insurance to investors; and by advising on governance, social, and environmental reforms. International agencies have a unique ability to operate at the interfaces between governments, investors, and civil society groups. The leverage of their development funding can be persuasive in securing the enactment and implementation of sector reform; effective management and mitigation of risks; and evolution toward socially

acceptable and environmentally sustainable development. Their objectivity and global experience can also give these agencies special credibility that can enable them to play a useful role locally or internationally at the request of governments and other stakeholders. Such agencies can use their convening power to bring a variety of groups together in a way that facilitates constructive dialogue and paves the way for participatory processes, especially those that spread across national boundaries.

BILATERAL DONORS. Bilateral donors are often partners in projects financed by the World Bank Group or other international agencies. This is also the case for the mining sector where governments might co-finance public policy projects directly, or where they are involved in private sector projects through their export credit agencies, trust funds, or similar arrangements. The partnerships may take various forms, ranging from providing co-financing or parallel financing to complement World Bank Group activities with grant resources, particularly for capacity building and for specific environmental and social activities related to the project.

PARTNERSHIPS. Over the past decade, governments and investors alike have come to recognize that they can no longer “do it alone” and that partnerships are needed to successfully develop mining projects. Civil society in general, and affected communities in particular, need to be fully consulted and supportive if mining is to take place in a satisfactory and sustainable manner. Trust among stakeholders, developed over time through joint undertakings while respecting one another’s role, interests, and comparative

advantages, has become a prerequisite to sustainable development based on mineral resources.

CODES AND GUIDELINES. A growing body of mostly voluntary agreements, codes, and inventories of best practice is shaping performance in the mining sector in a positive way. A good example is the recently developed international cyanide management code (www.cyanidecode.org). Effective consultation and partnerships can lay the basis for development and implementation of such codes and guidelines, which can be applicable at both the sector level and in individual projects. To be effective, codes and guidelines require stakeholder groups to have the capacity and motivation to effectively fulfill their respective roles.

The World Bank Group: Working toward Enhancing Environmental Performance in the Mining Sector

The World Bank Group’s mandate is to fight poverty and help improve people’s lives in developing countries. In working toward this objective, the Bank is aware that the mining sector for many countries is a large and often significant source of government revenue and foreign direct investment, providing opportunities for sustained economic growth and the reduction of poverty. At the same time, the poor are among those most exposed to risks associated with mining operations. They often do not share in the economic opportunities of mining. However, they bear many of the costs, as well as the risks that result from the introduction of a mine in an undeveloped area. The environmental damage incurred during a mine’s operation (or left behind after mine closure) can seriously impact people’s well-being

and livelihoods. A key element of the World Bank Group's work in the mining sector is therefore supporting governments in shaping regulatory frameworks and institutions such that their mining sectors can contribute to sustainable development. At the same time, the Bank Group works through its private sector arm, the International Finance Corporation, in encouraging responsible private investments in mining projects in developing countries (for a complete list of World Bank Group services in the mining sector, see inside back cover).

The World Bank Group has developed safeguard policies for environmental and social issues. These policies and guidelines are key elements of all Bank Group projects in the mining sector – wherever the Bank Group supports a government in ensuring the mining sector's impact on sustainable development, or a private firm in investing in a mining operation in a developing country. During the appraisal process, policies are identified that will be applicable to the project. After an investment decision, the project's performance is monitored against those policies. Compliance is the expected standard. The Bank's safeguard policies are derived from 45 years of experience developing projects around the world. They give governments as well as mining firms a powerful instrument for avoiding mistakes, reducing development risk, and improving project sustainability. They extend to:

- ▶ Environmental Assessment
- ▶ Natural Habitats
- ▶ Pest Management
- ▶ Indigenous Peoples
- ▶ Cultural Property
- ▶ Involuntary Resettlement

- ▶ Forestry
- ▶ Safety of Dams
- ▶ Projects on International Waterways
- ▶ Projects in Disputed Areas, and
- ▶ Public Consultation and Disclosure.

A Final Word: Investment, Competitiveness, Environmental Protection, and Beyond

As our knowledge of the scientific and operational issues has increased, the emphasis of environmental management has shifted from avoidance and mitigation of harm to the generation of environmental and other benefits that create a more favorable *net impact* from development. For example, new investors might undertake the remediation of past bad practices by others. Or, in addition to applying best practices to their own operations, investors might support the safeguarding of other areas of possibly greater importance that might be threatened (referred to as “offset areas”), or] fund or participate in environmental research, such as biodiversity surveys or experimental research. These areas, rather than questions of a legal and regulatory nature for minimum compliance, are likely to dominate the discussion about environmental issues in mining in developing countries over the next decades.

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Remy, Felix, and Gary MacMahon. 2002. *Large Mines and Local Communities: Forging Partnerships, Building Sustainability*. Mining and Development series (April). Mining Department, World Bank Group, Washington, D.C.

World Bank. 1996. "A Mining Strategy for Latin America and the Caribbean." World Bank Technical Paper 345. Washington, D.C.

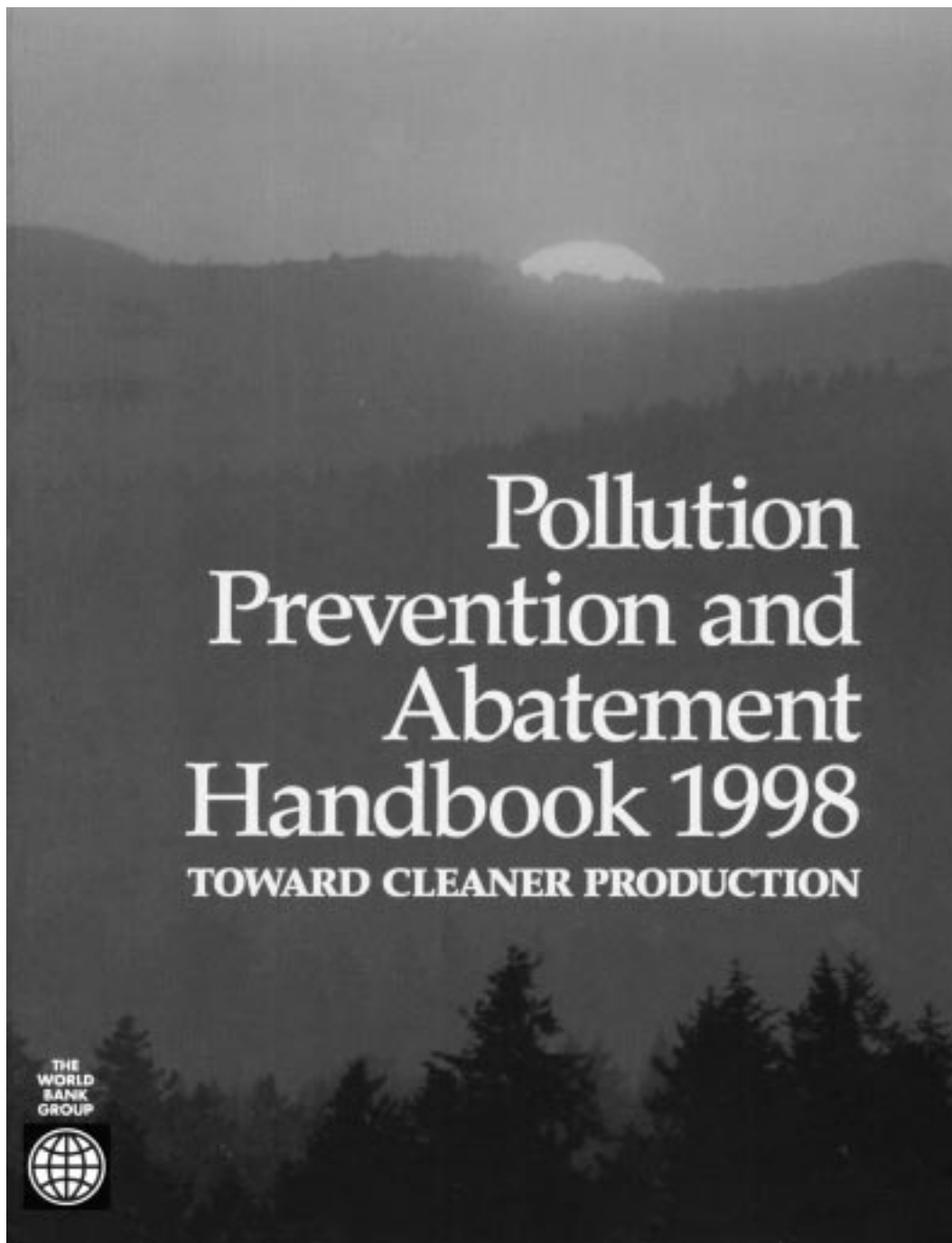
Innovest Strategic Value Advisors. 2001. "Sector Report Mining – Base and Precious Metals." Available through: <http://www.innovestgroup.com>

FURTHER READING

- ▶ World Bank Group Mining Department:
www.ifc.org/mining
www.worldbank.org/mining
- ▶ World Bank Group Guidelines on the Environment (IBRD/IDA, IFC, MIGA)
www.worldbank.org/environment/op_policies.htm
- ▶ The World Bank Group's Environmental Agenda:
www.worldbank.org/environment
- ▶ Experiences with Partnerships between Governments, Mining Firms, and Local Communities:
www.bpd-naturalresources.org/
- ▶ Poverty Reduction Strategy Sourcebook – Mining:
www.worldbank.org/poverty/strategies/chapters/mining/mining.htm
- ▶ The Pollution Prevention and Abatement Handbook:
wbIn0018.worldbank.org/essd/essd.nsf/Docs/PPAH
- ▶ Background Paper: World Bank Group Activities in the Extractive Industries:
www.eireview.org



FURTHER READING



THE WORLD BANK GROUP'S MINING DEPARTMENT

SERVICES TO GOVERNMENTS

Sovereign lending and advice for the design and implementation of policy and regulatory frameworks and interventions that help:

- ▶ Support private sector development and attract national and foreign investment for environmentally and socially sustainable mining.
- ▶ Equip government agencies to manage fiscal revenues from mining.
- ▶ Create economically, environmentally, and socially sustainable mine closure programs.
- ▶ Encourage local and regional economic development in the context of mining.
- ▶ Equip government agencies to restructure and privatize mining operations.
- ▶ Equip administrations to better administer/monitor and enforce environmental and social laws and regulations.
- ▶ Encourage coal extraction strategies that minimize global warming effects.

SERVICES TO THE PRIVATE SECTOR

Support and financing for environmentally and socially sustainable private sector investment in developing countries' mining sectors through:

- ▶ Equity investment in and loans to mining companies, including loans syndicated from commercial banks under IFC's syndications loan umbrella.
- ▶ Various risk insurance instruments (IBRD, MIGA).
- ▶ Advice and investment in support of privatization.
- ▶ Partnerships to disseminate and apply best practices (Business Partners for Development: www.bpdweb.org)

IFC has 29 mining projects in its portfolio for a total of \$669 million (FY2001).

SERVICES TO CIVIL SOCIETY

Support the dialogue with mining companies and government by:

- ▶ Facilitating access to information on projects, policies, and best practices.
- ▶ Arranging conferences and other formal and informal meetings.
- ▶ Supporting partnerships with mining firms and civil society organizations that integrate civil society in mining activities.
- ▶ Promoting general accessibility to civil society regarding World Bank and IFC-financed projects in mining and related activities.

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