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MINING AND DEVELOPMENT

Global



Mining

Mining Reform and  
the World Bank:  
PROVIDING A  
POLICY FRAMEWORK  
FOR DEVELOPMENT

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*On the cover: A detail of Arizona sandstone.*

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**M N N G A N D D E V L O D M N T**

**M n n g R e o r m  
and The World Bank  
PROV D N G A  
POLICY FRAMEWORK  
FOR DEV L O P M N T**

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## ACKNOWLEDGMENTS

"Mining and Development" is published by the World Bank Group's Oil, Gas, Mining and Chemicals Department. "Mining Reform and the World Bank" was written by Felix Remy, Lead Mining Specialist in the Department. The paper draws heavily on past papers of the Bank Mining Division, most notably the paper "World Bank Group Assistance for Minerals Sector Development and Reform in Member Countries, 1998," by Oronato, Fox and Strongman.

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Washington, D.C. 20433  
USA  
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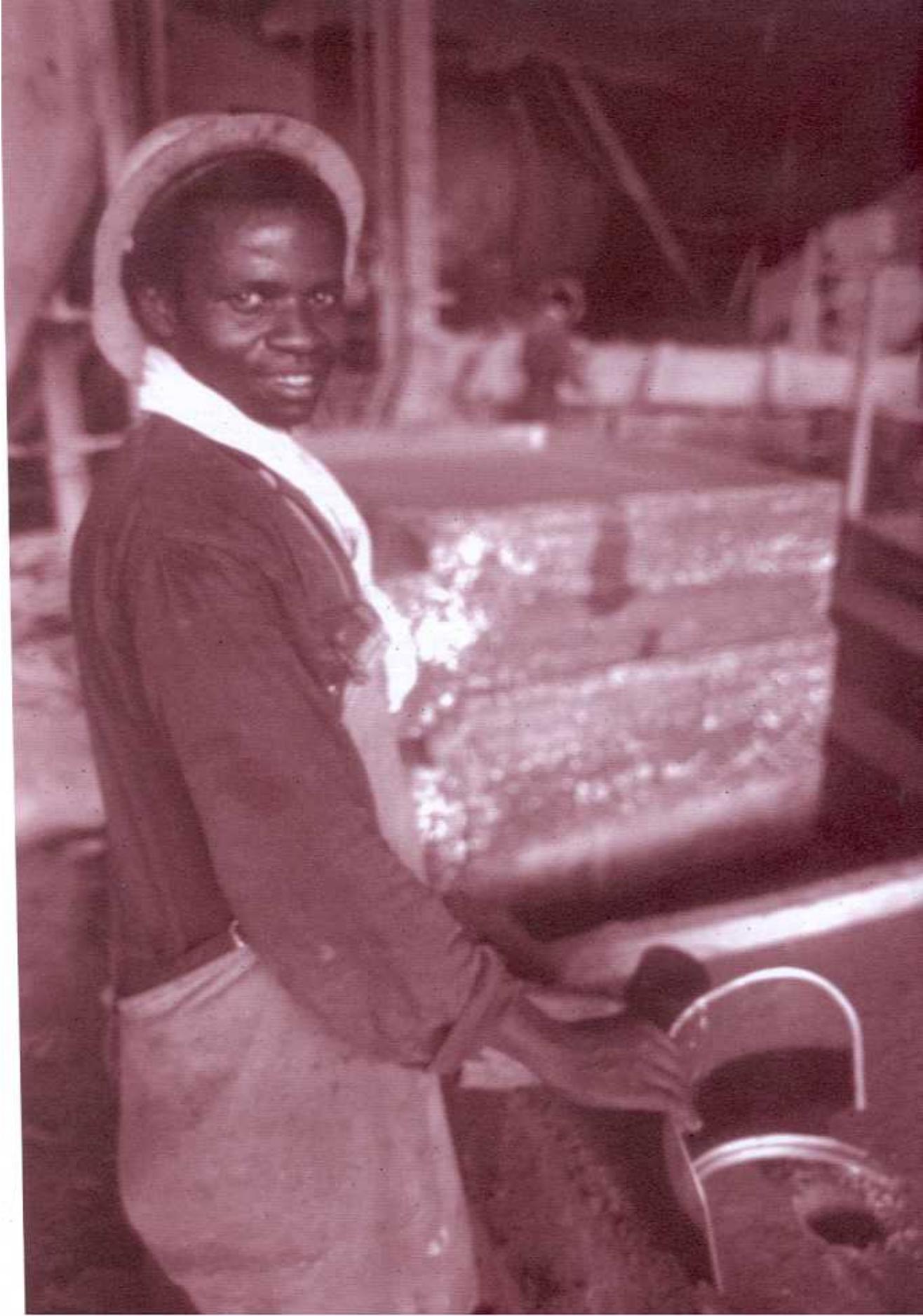
This is the sixth in a series of short papers published by the Oil, Gas, Mining and Chemicals Department of the World Bank Group, with a view to sharing experiences and exchanging ideas throughout a broad spectrum of developed and developing countries that form the world's mining sector. It is hoped that the series will not only capture common themes across the board but will also enlighten readers about the challenges and obstacles facing the mining community worldwide and the significant measures undertaken to mitigate them in the quest to make mining as equitable and as sustainable as possible.

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## FOREWORD

The World Bank has been active in mining sector reform for over a decade. Reforms not only attract private investment, but provide the policy framework for that investment to contribute to development.

The impact of the mining industry on the local economic development of neighboring populations and efforts to reduce poverty in mining countries of the developing world could be substantial in the next quarter century. The presence of an industry committed to the sustainable development of underdeveloped areas of developing countries could revolutionize its impact on the local economies, far beyond its past and current role of generator of foreign exchange and source of tax revenues.

This paper describes the history, process, and results of mining reform, and outlines the role the World Bank Mining Policy and Reform Division has played in this process.

These activities include assistance for the restructuring of large-scale state mining industries, in particular in Eastern Europe and the former Soviet Union.

Secondly, the Bank provides technical assistance and advisory services to countries in all regions of the world – Latin America, Africa, Europe, the Middle East and North Africa, East and Central Asia, South Asia and East Asia – to support the development of environmentally and socially responsible private sector mining development. This includes support for modernizing the mining licensing and fiscal regime, institutional strengthening and capacity building for mining sector public institutions, strengthening geological surveys to be useful information sources for both the public sector and private sector investors, and improving instruments and strengthening capabilities regarding environmental protection and social mitigation of the impacts of mining projects.

Thirdly, the Bank provides non lending assistance to address cutting edge and strategic issues at the interface between government, investors, and civil society. In recent years, these issues have included mine closure, mining and community relationships, and management of mineral sector revenues. In this role, the Bank uses its convening power to bring together key

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stakeholders to work on these issues. Most importantly, the Mining Division can provide relevant examples of how important issues are being addressed in different projects and countries around the world.

The outcome of these activities is to support countries developing sustainable mining industries, that is, mining industries which make important contributions to the national economy and local and regional development that can be sustained after mining ceases when ore bodies become depleted and uneconomic at individual projects. In this way mining can contribute to poverty alleviation and economic development for specific countries and communities, which is the core mission of the World Bank.

As expectations regarding the responsibilities of mining companies in the protection of the environment and their relationships with the local communities have changed, forward-looking governments are in the process of adjusting their policies to accommodate further evolution of the mining sector to the concept of sustainable

development. At the same time, those governments that have not yet reacted are under pressure from the international community to address the needs of those most affected by mining operations.

Through appropriate mineral policies, private sector investors can be encouraged and regulated to act responsibly and reflect the best interests of a nation. The management of these issues by the governments of mining countries will not only help define the enabling environment for the development of their mining sectors, but provide for the possibility of receiving ongoing benefits from the sector in the long term.

Mining reform provides a pathway for countries to maximize the opportunity of mining for sustainable development.

*Rashad Kaldany  
Director, Oil, Gas, Mining and  
Chemicals Department*

# I. Global Trends in the Mining Industry

## THE OPENING OF DEVELOPING COUNTRIES TO MINING INVESTMENT

### *Globalization and the Transformation of Mining*

In the last 25 years, the world's minerals industry has undergone a major transformation as it has increasingly come to operate in a new, more open economy. Initially, this transformation was caused by technological innovations, the infusion of international capital to finance projects, and the interaction of local communities and other stakeholders with the industry. In the last decade, the pace of change has accelerated noticeably, in large measure as a consequence of the liberalization brought about by the fall of communism and the accompanying globalization of the world economy. Three key elements of this new economy are the creation of global markets for capital as well as for goods and services; the explosive growth of communications and the emergence of a global information network; and the emergence of global values and the increasing role of civil society.

As little as 20 years ago, the minerals industry, while serving global commodity markets, operated only partially at the global level. In many mining countries, state-owned enterprises (SOEs) played a central role; these countries usually enacted legislation that blocked the access of private enterprises – that is, those with access to international

capital markets – to the best prospective areas available in these countries, while subjecting investors to confiscatory or unstable taxation policies. Globalization opened up to private investment the mining sectors of many countries that were previously quite restrictive.

The explosive growth of communications and the emergence of global values are closely linked. Through increased communications, activities and experiences in the minerals sector are quickly reported and transmitted throughout the globe, even to the most remote areas. A result of the increased communications and sharing of information has been the emergence of global values. As a consequence, the actions in any one country have the potential to have profound effects on other countries at the economic, social, and environmental levels. In this context, when one country's comprehensive and thorough mining reform has succeeded, many countries in all regions of the world have taken advantage of the experience and opened their mining sectors.

Chile was a pioneer. In the early 1980s, Chile overhauled its mining policies and opened the sector to private investment by leveling the playing field. It removed barriers to entry and exit, established full transferability of mineral rights, and adopted clear and non-discretionary rules that apply equally to public and private, national, and

foreign companies. Simultaneously, in Asia, Indonesia and Papua New Guinea, and in Africa, Botswana and Ghana took different approaches that were also geared toward creating the necessary conditions to enable a privately financed mining industry. The success of these initiatives, particularly the opening of the sector and the removal of barriers in Chile, caused many developing countries in all regions to take a hard look at the performance of their mining sector and to compare it with the Chilean experience and that of the lead reformers of their region (see appendix A). As a consequence, in the 1990s, several countries, initially in Latin America and then in Africa and Asia, implemented processes of mining sector reform along the lines pioneered by Chile.

### ***The Modernization of the State and the Increased Role of International Companies***

The shift in developing countries toward encouraging private investment in mineral resource development follows the opening of the general investment regime (in the areas of taxation, currency exchange, banking, trade, and labor), which opened all sectors to foreign investors. The characteristics of this shift include: allowing or expanding private access to mineral resources previously reserved to the state; a progression from ad hoc investment agreements toward standardization of rights and obligations; the application of the same rules to all participants in the sector, public and private, national or foreign; an increase in environmental protection requirements; a reduction in the levels of ad valorem royalties; a convergence in corporate income tax rates to a range of 30 to 35 percent; and a reduction in customs duties on imported capital goods.

Perhaps most fundamental has been a reorientation of the public mining institutions (PMIs) away from assisting the state in its role of owner-operator, and instead focusing on the role of the state as lessor and regulator.

The result has been an unprecedented competitive environment, with competition at all levels; this has had a profound impact on the minerals industry. The role of the state as a producer of mineral products was phased out, as it became clear that it was not sustainable because of a variety of factors. These included a lack of corporate focus, a lack of profitability, a lack of capital, a lack of investment in exploration and modernization of equipment and technology, an increase in competition for capital among potential areas for exploration, a poor record on environmental protection, a long-term trend to lower mineral commodity prices, and the inability of state-owned companies to cut production costs effectively.<sup>1</sup>

### ***Perceptions of Mining and the North-South Divide***

The opening of the minerals industry to the international capital markets also has increased the concern of civil society in the developed world about the activities of the minerals industry in the developing world. The view prevailing in some developed countries, particularly in Europe, of mining as an activity that pollutes and degrades the environment and the people, to be tolerated only under extremely restrictive conditions, has become a central issue to both the governments and companies interested in the development of mining in

<sup>1</sup> As noted below, successful state-owned mining enterprises, such as Codelco in Chile and Soquem in Canada, are rare exceptions to the above rule.

developing countries. This view is largely a result of lingering perceptions of the old, pre-reform type of mining, from which industry leaders have begun to distance themselves.

Such perception must be contrasted with the view of mining held by many in the developing world: that is, mining is an essential industry and an immediate and important way to help the poor gain some of the benefits of modern society. There is a concern about the environment, but the imperatives are social and economic and are of immediate nature. The issue is how to get today's generation out of poverty and build strong, sustainable communities.<sup>2</sup> The presence of developed country NGOs in the developing world – which reflects the large, unfinished social and environmental agenda of the mining industry – acts as a link between the developed and the developing countries' views of mining.

In addressing the existing situation, the international mining industry has made significant progress in the environmental area, while its work on social issues is at an earlier stage. Environmental management has by now been incorporated into all aspects of the mining cycle, from exploration through closure and reclamation, and is now part of the corporate culture of the industry leaders. Most importantly, an environmental ethic has emerged for the mining industry: that of stewardship, with the company assuming responsibility for the temporary use of the land, minimizing the impacts, and restoring the landscape once mining is over.

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<sup>2</sup> Thomson 2001

At the same time, many mining and mineral exploration companies are grappling with a much more demanding relationship with the local populations. Companies are realizing that to proceed with a project today, they must secure not only a license to operate but a social license as well, based on open dealings, consultation, trust, and a long-term commitment to community development.<sup>3</sup> The good news is that the leading companies, after a cautious start, have become aware of the need for social license. An increasing number of companies are adopting policies and procedures based on the principles of respect for the community and the local culture, transparent communications, the use of consultation, mitigation of social impacts, enhancement of social and economic benefits, and participation in community development.

### ***The New Mining Industry***

Thus, the non-traditional “soft” factors have become paramount in the mining industry as a consequence of its increased exposure and the awareness by the public at large of its social and environmental impacts. As companies from Australia, Canada, and the United States have moved away from their domestic markets and have begun to operate globally, they have shifted their attention to global markets and the issues affecting the immediate surroundings of their mining operations. Meanwhile, as the role of the state in the mining sector has diminished and the presence of international mining companies has increased, the international community has increased its involvement in monitoring the impact of mining on the local communities. The presence of international civil society has

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<sup>3</sup> Remy and McMahon 2002.

increased the transparency of the monitoring. It has also shifted the emphasis from the narrow environmental definition of sustainability to one of sustainable communities: that is, communities that are able to turn part of the wealth generated by mining into an asset base that will ensure viable economic activity in the region, beyond the mine and independent of it.

These events are placing the mining industry in a position where its impact on the local economic development of neighboring populations, and thus on efforts to reduce poverty in mining countries of the developing world, could be substantial in the next quarter century. The mineral industry is a global industry whose presence in developing countries continues to increase, and whose activities take place largely in remote and depressed areas within these countries. Mining is an activity that will come to stay in a region for the long term, and it is a powerful instrument for transferring skills and technologies to these remote locations. The presence of an industry committed to the sustainable development of underdeveloped areas could revolutionize its impact in the local economies, far beyond its past and current role of generator of foreign exchange and source of tax revenues.

## **THE 1990s AND THE REFORMS OF THE MINING SECTOR**

### ***The Southbound Migration of Exploration***

A decade of major reforms in the mining laws of mining countries combined with high metal commodity prices to trigger a new world exploration scenario. The high

metal commodity prices of the 1990-97 period provided risk-taking junior mining companies with the resources to initiate the massive migration of the mining industry to the developing countries. By 1997, they had become important players in the industry by utilizing some of the world's best exploration talent. They led the gold exploration of the late 1980s and early 1990s, bringing in the major international houses as partners when significant prospects were found. As the price of gold flattened in the early 1990s, the juniors diversified and took advantage of the high prices of base metals and diamonds until 1997. As many unexplored developing countries with high geological potential opened their mining sectors to foreign investment and the risk-taking juniors achieved some spectacular finds in the newly accessible areas, the entire industry realized that it had little choice but to review its development strategies.

The outcome of these events was a considerable shift in the geographical distribution of investment in exploration. This is the industry indicator most sensitive to policy, and the shift signaled the increased attractiveness of the developing countries. The share of worldwide exploration investment of the developing countries increased from about 35 percent in 1989/1990 to about 63 percent in 1997, a peak that coincided with the end of the era of high prices of the metal commodities. Since then, as the prices of metal commodities has dropped to some of the lowest levels ever recorded, a significant number of international mining companies have either drastically cut or withdrawn from their offshore exploration programs and have focused their business on their traditional geographical areas. As a

consequence, the share of developing countries of the investment exploration pie has decreased – but only slightly, from 63 percent in 1997 to about 58 percent in 2001.

### ***Investors' Responses to the Different Approaches to Reform***

The performance of individual developing countries and regions in attracting private sector exploration investment during the 1990–2001 period varied sharply, reflecting differing perceptions in the quality of the reforms implemented in different regions. When metal commodity prices were high – that is, between 1989/1990 and 1997 – exploration investment increased by 80 to 85 percent worldwide, from about US\$2.8 billion to about US\$5.1 billion. In the developing regions, it grew 220 percent. In Latin America, it quadrupled. Most significantly, if Chile (which had reformed its legal-institutional framework in the early 1980s and was already attracting considerable investment in the late 1980s) is excluded from the statistic, the growth in Latin America was tenfold. This resulted in an increase in the Latin American share of the total from 13 to 29 percent. Africa's participation increased from 12 to 16 percent, and the share of the Southeast Asia and Pacific region increased from 6 to 10 percent. Latin America also performed better when the prices of metal commodities fell. In response to the drastic fall of prices, worldwide investment in exploration plummeted from US\$5.1 billion in 1997 to about US\$2.2 billion in 2001, and many international companies cut their offshore exploration activities. Only Latin America among the developing regions kept its share of 29 percent of the world total.

**TABLE 1: EXPLORATION INVESTMENT BY REGION**  
(percentage of world total, unless otherwise specified)

	1989/1990	1997	2001
Total worldwide (US\$ billion)	2.8	5.1	2.2
Developed countries	65	37	42
Australia	24	17	17
Canada	26	11	15
USA	15	9	8
Developing and transition countries	35	63	58
Africa	12	16	14
Latin America	13	29	29
Southeast Asia and Pacific	6	10	7
Rest of world*	4	8	8

*Note:* Rest of World includes the former Soviet Union, Middle East, and Eastern and Western Europe.

*Source:* For 1989/1990, World Bank staff estimates. For 1997 and 2001, "Corporate Exploration Strategies" Metal Economics Group.

## II. The Role of the World Bank in the Mining Sector

### FROM PROJECT DEVELOPMENT TO PRIVATE SECTOR DEVELOPMENT

#### *The Traditional Role: Project Development<sup>4</sup>*

The traditional role of the World Bank<sup>5</sup> in minerals development during the "pre-reform" period – through the 1980s – was to provide infrastructure and project finance for the development of major fuel and non-fuel mining projects in developing countries. These projects, which were undertaken first by private sector mining companies and later by state-owned mining companies, did not have access to other sources of funds. The project finance extended by the World Bank differed from more modern conceptions of project finance for minerals development. The World Bank's recourse for debt service and for repayment was not limited solely to the assets of the project concerned. Its ultimate recourse was always to sovereign credit. The loan conditions would include "environmental and social" covenants consistent with the World Bank Group's operational directives on the environment, resettlement, and indigenous peoples. Many major mining projects in developing countries, such as Carajas in Brazil, Bukit Assam in Indonesia,

and Wengfu in China, were established in this way.

#### *The Evolution of Different Approaches to Non-Fuel Minerals and Coal<sup>6</sup>*

*THE APPROACH TO NON-FUEL MINERALS: SUPPORTING MINING REFORM.* With the growing recognition that state enterprises had performed poorly in the mining sector, as in other productive sectors, the World Bank in the late 1980s undertook a review of its strategy toward non-fuel mining. The results of that review were presented in *The Strategy for African Mining*, a 1992 study by the Mining Unit of the World Bank, which noted the importance of the mining sector as a source of tax revenues and foreign exchange in Africa. The report also noted, however, that "Africa has failed to mobilize the necessary risk capital and investment funds needed for sound and orderly mining development."<sup>7</sup> The report looked into the causes behind these failures and outlined the principles of reform to address them.

A 1996 study, the *Mining Strategy for Latin America and the Caribbean*, by the World Bank Industry and Mining Division addressed mining reform strategies in more

<sup>4</sup> Onorato, Fox, and Strongman 1998.

<sup>5</sup> World Bank here refers to two members of the World Bank Group, the International Bank for Reconstruction and Development and the International Development Association, commonly known as the "World Bank."

<sup>6</sup> Onorato, Fox, and Strongman 1998.

<sup>7</sup> World Bank 1992. Foreword.

depth. It examined legal reforms, the restructuring and strengthening of public mining institutions, the promotion of local medium- and small-scale private sector mining, and the management of environmental and social issues.<sup>8</sup> This report presented for the first time a coherent agenda of policy, regulatory, environmental, fiscal, and institutional reform that has subsequently helped shape assistance by two member entities of the World Bank Group, the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA), for non-fuel minerals for developing countries in all regions.

The new strategy for non-fuel minerals developed in the 1996 *Mining Strategy for Latin America and the Caribbean* recognizes the willingness of private sector banks and other official lenders to finance non-fuel minerals development in developing countries. Thus, examples of World Bank (IBRD and IDA) investment loans to fund the development of large-scale non-fuel minerals projects are comparatively rare now. Such projects with the private sector are now largely financed by the International Finance Corporation (IFC), the private sector arm of the World Bank Group (WBG); they are insured by another WBG member, the Multilateral Investment Guarantee Agency (MIGA).

The main focus of the World Bank's work program in the non-fuel mining sector has become providing financial and technical support to mining countries to enable them to assess, adjust, and reform their mining development programs. The reform centers on stimulating greater private sector participation, privatizing state-owned assets, and establishing the conditions for sustainable minerals development.

The reforms emphasize competition and the role of the private sector as investor and operator, and promote the role of government as lessor and regulator. In an initial phase of the sector reform work, the World Bank assisted the non-fuel segment of the industry with a variety of instruments. These included structural and sectoral adjustment loans, which provide fast-disbursing support to assist countries that undertake a program of policy reform; technical assistance programs (including loans and credits to finance the costs of studies and consultants' services); and grant funds created by IBRD or provided by member countries or other international organizations for IBRD to administer. In a second strategy adjustment, these technical assistance projects were integrated into the multisectoral programs funded by the Bank with Programmatic Structural Adjustment Loans (PSALs) and Credits (PSACs).

#### *THE APPROACH TO FUEL MINERALS: REDESIGNING DOMESTIC INDUSTRIES.<sup>9</sup>*

The situation is different regarding coal and lignite. For these fuel minerals, the Bank continues to have a role in providing investment finance to support mining operations, as part of broader reform programs in countries with rapidly growing coal industries or in countries in transition that have significant excess production capacity. Unlike non-fuel minerals, which are typically exported and sold in international markets at world prices, most coal mined in developing countries and in countries in transition is produced for domestic markets. Entry is frequently limited, prices are often regulated, and customers are typically government entities, often in a perilous financial situation. In these circumstances,

<sup>8</sup> World Bank 1996.

<sup>9</sup> Onorato, Fox, and Strongman 1998.

the approach of attracting foreign investors or international mining companies will not work without first redesigning the domestic industries to create competitive private producers and consumers. Consequently, World Bank Group activities in coal center on encouraging the development of a competitive marketplace for coal and support the privatization of state-owned coal mines and private investment in coal mining. The Bank also supports initiatives to make coal mining more socially and environmentally sustainable, backs studies to reduce and mitigate the harmful environmental impacts of coal use, and helps cushion the social impacts of the downsizing of coal industries with substantial structural overcapacity.

The World Bank's assistance in privatizing the Russian coal industry illustrates this approach. In just a few years, a remarkable transformation in ownership has occurred. Between 1993 and 2001, the share of coal produced by privately owned companies in Russia increased from less than 10 percent to about 77 percent. Privatization proceedings are underway for the last major coal companies remaining in state ownership, which should result in over 90 percent of coal output being in private hands by the end of 2002. This rapid change has taken place despite the widespread perception of the Russian coal industry as a troubled, loss-making industry. The World Bank became involved in this process in mid-1996 with the extension of a \$US 500 million Sector Adjustment Loan (SECAL), which supported early efforts undertaken to demonopolize and commercialize the industry. During this period, the state acted as trustee for the industry. As the government failed to meet the agreed trust management targets, and as there was shared

recognition of the failure of the trust management approach, the government decided to adopt a policy of competitive direct privatization. This was supported by a second World Bank loan in December 1997 for \$US 800 million. Throughout the process, the Bank provided technical assistance to finance privatization-related activities, such as funding a privatization expert in the staff of the implementing agency, backing business appraisals and initial price calculations for some coal companies, and developing restructuring programs, management and financial training programs, and environmental audits.

The new approach to coal reform in countries in transition with structural, excess coal capacity is based on the need to help those countries carefully consider the downsizing of their coal industry production capacity. For a number of countries in transition, many existing mines will not be financially viable under market conditions because of their geological characteristics, coal quality, and/or geographical location. Dealing with these mines involves addressing a wide range of social, financial, and environmental issues which, in turn, impact on project preparation and design for World Bank assistance. Large coal sector programs developed in recent years for Poland and Romania (box 1) illustrate the approach.

*ASSISTANCE FOR SMALL-SCALE AND ARTISANAL MINING.* The level of small-scale mining activity in many developing countries is of great significance and continues to grow. Much of this activity occurs outside the formal economy. Latest estimates suggest that over 10 million people are directly engaged in artisanal and small-scale mining activities, with

## BOX 1.

### MITIGATING THE ENVIRONMENTAL AND SOCIAL IMPACTS OF MINE CLOSURE IN ROMANIA

In Romania, the World Bank is helping ease the process of mine closure. Twenty-nine uneconomic mines are being closed with Bank support, serving as a model for 174 further mine closures. Prior to the project the Romanian government decided to close these uneconomic mines; subsidies by the mid-1990s drew around US\$400 million annually from the state budget. By 1997, 83,000 miners – out of 173,000 – had left the industry and production had stopped in 160 mines, resulting in a sharp increase in unemployment, social hardship, and unrest. The World Bank US\$44.5 million assistance program commenced in 1999 and will help close 29 uneconomic mines in an environmentally acceptable manner; finance social mitigation (support for mine workers and their families, as well as for social services and communities dependent on the mine); and support labor market interventions (training, employment assistance, microcredit). The Bank will also help redesign the regulatory framework for managing mining, including the definition of environmental and social responsibilities. A manual for mine closure and financing social mitigation measures and environmental rehabilitation has also been developed.

another 80 to 100 million people directly or indirectly dependent on the production from these activities for their own livelihoods. During the past decade, the number of people involved has steadily increased; most of this growth has been driven by poverty.

Perhaps the most troubling aspect of this form of mining for governments has been

its informal nature and the set of significant environmental, health and safety, and social issues associated with it. Because the methods of mining and processing employed are usually relatively simple and inexpensive, the barriers to participation are low. The majority of people are not miners by choice but by necessity, and their level of technical knowledge and experience is low. Yet, while this activity provides few macroeconomic benefits, it has proved to be critical to the economic survival of many dispersed rural communities and otherwise impoverished households, as it often stimulates important additional rural economic activity.

The World Bank approach to artisanal and small-scale mining has evolved over time. The Bank initially focused on financial and technical support, including improved equipment and methods, environmental monitoring and remediation, and the development of appropriate regulatory and institutional frameworks. It evolved into more comprehensive and integrated approaches that address a range of issues. These include “formalization” of the sub-sector and organization at the production level; amelioration of health and safety and environmental practices; improved access to and application of appropriate technology; and development, where viable, of its business and commercial potential. This more elaborated approach is epitomized by Bank-supported programs in Ecuador (see box 2 on page 10), Burkina Faso, and Madagascar. World Bank support and intervention have become a balancing act between recognition of the capacity of small-scale mining to alleviate poverty and the need to address its most problematic aspects: that is, to make it more environmentally and socially responsible, without

**BOX 2.****SUPPORT FOR ENVIRONMENTALLY AND SOCIALLY RESPONSIBLE SMALL-SCALE MINING IN ECUADOR**

In Ecuador, unsafe mining techniques and severe environmental damage from small-scale mining have resulted in living conditions that have endangered people's lives and the environment. The Bank-financed PRODEMINGA project allocated funds to a fully integrated program addressing the environmental and social problems of small-scale mining, while taking into account complex sociological issues of migration and gender. The project has made a significant contribution to developing sustainable remedial measures to limit the environmental degradation caused by small-scale mining. It has also facilitated the organization and management of small-scale miners' associations, with a view to upgrading the efficiency and performance of the sector. The project was also instrumental in setting up a network within Ecuador among NGOs, other agencies working on small-scale mining, and government authorities with a view to taking a systematic and collaborative approach on the matter.

promoting it as a "sustainable" livelihood activity in its current form, which it clearly is not. To these ends, the Bank has been facilitating a "global" dialogue on artisanal and small-scale mining, and is hosting a global initiative to better coordinate knowledge-sharing and its application in development assistance programs and interventions. This initiative, called CASM, an acronym for Communities and Small-Scale Mining, is sponsored by a variety of international organizations, including the International Labor Organization (ILO), the United Nations Department of Economic and Social Affairs (UNDESA), Conservation

International, and the British Department for International Development (DFID).

CASM has begun to develop knowledge-sharing networks across regions and interest groups (governments, artisanal miners, NGOs, donor agencies, and mining companies). The importance of this initiative in ensuring the availability and sharing of the best practices known, lessons learned, and technical expertise in an integrated and coordinated manner will likely increase as the poverty reduction and integrated rural development goals of the Bank's work are themselves further clarified and strengthened.

**USING BEST INTERNATIONAL PRACTICES IN MINING REFORM*****Identifying Best Practices for the Sustainable Development of Minerals***

The World Bank contributes to the process of developing policy responses to development issues in the minerals sector by collecting, assessing, and disseminating knowledge about topical minerals development issues. It does this not only through its involvement with member countries in its operations but also through publications and by participating in and sponsoring seminars, conferences, and industry roundtables. Some publications synthesize the results and outcomes of reform work done by the World Bank in member countries, such as the 1992 study, *The Strategy for African Mining*, and the 1996 report, *A Mining Strategy for Latin America and the Caribbean*. Others disseminate the conclusions of research done or coordinated by Bank staff, such as *An Environmental Study of Artisanal, Small*

and Medium Mining in Bolivia, Chile and Peru (1999), *Review of Legal and Fiscal Frameworks for Exploration and Mining* (2001), and *Large Mines and the Community* (2001). Findings and conclusions from seminars and other gatherings may be published, such as *Mining and the Community: Results of the Quito Conference* (1998) and *Mine Closure and Sustainable Development* (2000). Seminars and workshops have covered a wide range of subjects such as coal industry restructuring, the impact of mining in local communities, mining and sustainable development, and regulatory issues.

The work of the World Bank in identifying and disseminating best practices in mining reform aims at providing guidance to member countries. By using instruments such as publications and seminars or workshops, the World Bank contributes to a better understanding of the implications of the different options and to the awareness of the member countries as to what to expect from each option. Furthermore, as new knowledge is generated in different member countries, the Bank continues to play a role in assessing the pros and cons of the new approaches and in disseminating what seem to be the best international practices, as tested by the experience of countries.

### ***The Need for a Comprehensive Approach to Reform***

The implementation of a mining industry led by the private sector has required a fundamental shift in the role of governments in the mineral sector from being both owner-operator and referee to being the lessor and regulator. The reform initiatives of the last decade offer clear and incontro-

vertible evidence that the countries that have implemented such a shift successfully have taken a comprehensive approach to mining reform. The reform works best when it is integrated into the rest of the economy. The process starts with a well-defined minerals development policy tied to the establishment of a sound macroeconomic and trade environment that opens the economy generally to foreign investment and open trade. The reform must also be comprehensive, including a stable and consistent foundation of laws and regulations, institutions to administer them, codes of conduct with stable, transparent, and consistent application and must focus properly on adequate coverage of both the environmental and social impacts of mining operations.

### ***Toward Modern Mining Legal Frameworks***

**ISSUES THAT A MODERN LEGAL FRAMEWORK MUST ADDRESS.** The modern legal framework for exploration and mining typically addresses the topics of government authority, conditions of access to mineral holding lands, exploration and mining rights and obligations, protection of the environment, and fiscal terms. Aside from the fiscal matter, none of these issues – which are of fundamental importance to the mining investors – is addressed in the more general investment legislation. They thus require a mining-specific legal framework. In addressing these matters, the successful mining legal reforms have tended to establish the legal framework for exploration and mining on the following six building blocks, which constitute the defining factors of sector policy: redefinition of the role of the state; private access to mineral resources; security of tenure;

freedom to operate on a commercial basis; comprehensive environmental protection; and competitive and stable fiscal terms.<sup>10</sup>

*Redefinition of the role of the state.*

National governments now focus their mining policies not on how they can acquire control of the mineral deposits but on how they can attract sustainable private capital flows to develop them. This requires that the legal framework clarify and strengthen the nature of the mineral rights that private investors will receive; that the role of the state be clearly stated; that consistency between the legal framework and the constitutional foundation be ensured; and that the legal instruments that regulate exploration and mining be defined by law.

*Private access to mineral resources.* In order to ensure private investors access to mineral resources, the legal-policy framework should open a set of key variables. These include: liberating areas that may have previously been reserved for future exploration or mining by the state; maintaining an open title registry of mineral rights; providing rights through standardized agreements/permits; granting rights according to objective, non-discretionary criteria, preferably on a "first come, first served" basis; encouraging relinquishment by mineral rights holders; and allowing the transfer of exploration and mining rights.

*Security of tenure.* This means that the mineral right holder must be given a sufficient term to carry out the intended exploration and mining activities, the virtual automatic right to mine what he has

discovered, and clear and objective (that is, non-discretionary) obligations in order to maintain his rights in effect. These requirements are all subject to clear and transparent procedures.

*Freedom to operate on a commercial basis.*

The investor must be assured that he will have operating control of the mining operation, the right to market the minerals produced, the liberty to manage the proceeds of the sales in offshore accounts, and the right to transfer and mortgage the mineral rights.

*Comprehensive environmental protection.*

Environmental matters related to mining are typically regulated by both mining and environmental laws. Issues that must be defined in these laws include land use and utilization of mineral resources; provisions for special protection; functions and authority of environmental institutions and organizational structure to be used for environmental management; the approach to the management of physical and social environmental issues; environmental impact assessment requirements; obligations of mineral title holders; distinctions between new and existing operations; "residual" environmental liabilities; steps to bring pre-existing operations into compliance; the definition of environmental sureties; tax treatment of environmental obligations; environmental planning tools and policy instruments; special provisions; environmental incidents and accidents; environmental defaults and crimes; and fees.

*Competitive and stable fiscal terms.* Fiscal matters are also regulated by both general taxation laws and mining laws. Areas that must be covered under these norms include profit-related taxes, output-related

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<sup>10</sup> Naito, Remy, and Williams 2001.

taxes, input-related taxes, fees, calculation of the taxation base, tax incentives, environmental allowances, and penalties.

*Other key issues addressed.* In addition to the above, the mining law must address the following issues: artisanal and small mining; health and safety of mining workers; ancillary rights of title holders; and penalties.

*THE PROCESS OF PREPARING A MODERN MINING LEGAL FRAMEWORK: ENSURING ADEQUATE SOLUTIONS AND STAKEHOLDER OWNERSHIP.* The importance of the above issues makes it imperative that the law deal with each of them adequately. Similarly, their political and social sensitivity makes it imperative that the authorities and other key stakeholders have ownership of the resulting legal framework. In such context, the World Bank has a role in assisting in the effort to ensure the competency of and technical support given to the team responsible for the preparation of the draft law, and that the process of preparation of a mining code consider adequate consultation with key stakeholders. Given the wide diversity in the institutional capacity of different developing countries, the procedures followed to prepare mining codes have varied significantly.

The participation of the World Bank has also varied significantly: In those countries with the capacity to carry out the process independently, the Bank has simply provided opinions on the general objectives and key instruments of the proposed law. In those countries with relatively less institutional capacity, the Bank has played a very active role in assisting the authorities in the preparation of the laws. For example, the mining laws of 1992 in Mexico and

Peru and the 1993-1995 amendments to the Argentine law were drafted by commissions of experts and representatives of key institutions from the private sector and government who were appointed by the Minister responsible for the mining sector. The World Bank provided input at the initiation of the process regarding the objectives and central characteristics of the new instrument. The mining law of Bolivia of 1997 and the amendments to the Ecuadorian law of 2000 were also drafted by ministerially appointed commissions of experts representing key institutions from the public and private sectors. The World Bank had a more active role, as it provided an initial diagnostic and then later technical support through specialized legal advisors, participated in key meetings of the commission, and provided comments on the drafts in the different stages of the work.

The World Bank took a more active role in countries with less developed institutional capabilities, as was the case in Mongolia (1997), Madagascar (2001), Democratic Republic of the Congo (2002), and Ghana (draft of 2002). Bank teams worked with local experts from the key sector institutions in the development of mining legal matrices, which listed all the key issues of the six building blocks of a modern legal framework (see discussion above) and spelled out the options to properly address each of the issues. These matrices were then reviewed in detail and agreement was reached as to options to all the issues in discussions with these local experts and other selected representatives of the public and the private sector. In Ghana, the matrices were discussed with NGOs and local stakeholders in specially organized workshops. Once agreement is reached, a draft law can be easily prepared, as the

approach to be taken in addressing the key legal issues has been defined. The final drafts that emerged from such processes were then submitted to Parliament for approval.

### ***The Reform of Public Mining Institutions and the Role of the Modern State***

**THE NEED FOR INSTITUTIONAL REFORM.** The role of lessor and regulator of government in the mineral sector must be seen in the context of the overall economic and development policies of a country. After decades of state intervention, many countries are shaping free market economies. To be responsive to these changes, public institutions must change their mandates and roles to administer the regulatory framework effectively and to provide public goods to support the implementation of the government's new policies and fulfillment of its new responsibilities. Therefore, the state should commit itself within the mining sector to defining policy, establishing the legal, fiscal, and regulatory framework, administering mineral rights, protecting the environment and health and safety of the miners, and setting up a modern and reliable geological information infrastructure.

A clear separation of functions between the public and private sectors is necessary in order to implement the new role of the state effectively. In the market economy, investments in productive activities, such as mining exploitation, and the provision of services, such as drilling or laboratory assays, that are not public goods are the responsibility of the private sector. For example, in the area of geological knowledge, the line separating the gathering of

basic geological information from exploration must be clearly delineated. The interest of the nation in such areas as earthquakes and other geological hazards, water resources, and the use of non-renewable resources gives the state a legitimate role in terms of the need to develop and maintain a reliable national geological database. Yet it is important to separate this from exploration, a high-risk, high-cost activity more closely related to the productive end of the industry, which must be left to the private sector. Evidence shows not only that state-supported mineral exploration has proven to be ineffective and costly but, even worse, that state organizations involved in exploration have often been granted large areas of mineral rights in some of the most geologically attractive areas. The final result has been that access to mineral resources by qualified investors has been blocked, thereby severely limiting the possibilities of mineral sector development of many countries.

**ESTABLISHING THE INSTITUTIONAL FRAMEWORK FOR A REFORMED MINERAL SECTOR.** Strong and capable institutions are a fundamental prerequisite for the satisfactory implementation of development policies and of the legal framework. The experience of the successful mineral sector reforms of the 1990s shows that a simple institutional structure, if established with a careful assignment of functions and based on a clear definition of objectives and scope of activities, contributes to a climate of confidence and transparency in the administration of sectoral policy. A structure that has proven to be satisfactory and can facilitate the implementation of reform includes the following: a ministry or department of mines that acts as the political head of the sector,

responsible for policy making and investment promotion; a mining cadastre office to administer mineral rights; a geological survey to provide earth science information; a mining environment office to interface between the operators and the national environmental authority; and a mines inspectorate to supervise matters regarding mining occupational health and safety issues.

An advisable first step in the establishment of this institutional structure is to provide it with a sound legal foundation. Therefore, the mining law should outline the role of the state in the sector, specify those activities of the mining development sequence in which the state will or will not be involved, and clearly delineate the role of each PMI in fulfilling the responsibilities of the state in the sector. Countries successful in providing a reliable source of financing for the core functions of their PMIs have included within the mining law the definition of the source of funds (for example, a part of the concessions fees) and their use.

The sustainability of the PMIs depends on the treatment given to the key institutional variables, human resources, financial resources, and management quality – and on ensuring that political interference will not affect their performance. Assistance provided by the World Bank to strengthen and modernize the PMIs aims at establishing clear civil service rules and legally constraining mandates in order to prevent frequent or drastic changes of the sector institutional framework in which the PMIs work. The methodology often applied in the actual work of institutional reform – as part of an initial overall assessment or, more effectively, of an institutional development

process, interactive and participatory at all stages – includes the following:

- Assessment of the existing situation, including the identification of public and private demand regarding services to be provided by the PMIs.
- Definition of the roles of the public and private sectors with respect to the management and development of mining.
- Definition of the vision, mandate, and institutional output products, such as cadastral titles, geological maps, and environmental permits.
- Definition of responsibilities and functions of the PMIs, and design of the operational procedures to generate the products.
- Definition of work programs and a development plan.
- Design of a human resources policy, including identification of skills needs, availability, and gaps; definition of job profiles; recruitment criteria; training needs; and career opportunities.
- Identification of funding sources and realistic assessment of budget needs to ensure core functions, as well as development of management capacity.
- Identification and set-up of mechanisms for monitoring of performance indicators, including timely delivery of services and client satisfaction, and for continuous improvement of processes and capacities.

Strict prioritization and selectivity need to be applied in the design of an institutional development plan. A selective approach, which identifies areas in which progress is either needed or feasible in a reasonable period (say, three to five years), is likely to yield better results than an overambitious program that tries to address all the identified deficiencies simultaneously. For example, given the fast pace of mining

sector development in Argentina and Peru in the 1993-1997 period, priority was assigned to the strengthening of the Mining Cadastre Office and the Mining Environmental Office. Meanwhile, work was begun on the geological surveys, but at a slower pace. Similarly, the managerial capabilities available and the relative importance of the sector to the economy of the country concerned will determine whether a restructuring of an institution is needed or if work will be limited to modernizing and refocusing the institution, and whether the information infrastructure needs to be developed or simply improved.

*PMIs AND SUSTAINABILITY.* The PMIs play a key role in the sustainable use of mineral resources. Areas of mineral potential need to be evaluated and managed in the context of existing and alternative land-use options, integrating social, environmental, cultural, and economic factors. The PMIs provide essential tools for efficient and transparent land-use planning and management (appendix B).

### ***Mining Environmental Management and Sustainable Development***

*SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL AND SOCIAL CONCERNS IN MINING.* As expectations regarding the responsibilities of mining companies in the protection of the environment and their relationships with the local communities have changed, forward-looking governments are in the process of adjusting their policies to accommodate further evolution of the mining sector to the concept of sustainable development. At the same time, those governments, that have not yet reacted, are under pressure

from the international community to address the needs of those most affected by mining operations.

Environmental considerations have become obligatory elements in mining ventures, and those countries with competent environmental management have proven to have an advantage in the attraction of new investment. The mining industry, led by the major international mining companies, has accomplished significant environmental progress in the last few years. These companies prefer to enter countries with known environmental policies and established environmental management, as those are likely to be the first countries to establish clear, sensible, and non-discretionary policies and standards on the social issues. Furthermore, international banks and development organizations are demanding rigorous environmental conduct, including the social aspects. The smaller companies, which depend most on credit, will therefore be required to implement sounder environmental management. The absence of such policies will therefore be a disincentive to mining investments.

In aiming at the sustainable development of mining regions, governments, local communities, and other stakeholders must balance the economic objectives of higher incomes, access to education, and opportunities for work with the environmental goals of improving the levels of health, safety, and well-being in pleasant surroundings, and the social goal of developing strong community networks. The identification of these factors and the need for balance, as a prerequisite to the sustainability of the impact of mining on the local economy, provides the stakeholders with a general sense of their role in the local development

process and a direction on how to manage those aspects of a project which they control. They also establish the responsibility of the three main stakeholders – the government, the mining company, and the community – to coordinate their roles through a trilateral dialogue, where such balance can be consensually arranged.

*MINING ENVIRONMENTAL REFORM WORK.* The environmental administration of the mineral sector should form part of a wider national environmental management system with established policies, norms, and procedures aimed at sustainable development and which address all key environmental and social issues. The main elements of such a system include an environmental policy stating its goals and strategies; an environmental action plan for all business sectors; an “umbrella” environmental law that allows for sector-specific regulations; establishment of goals for environmental quality and standards for air and water; establishment of public institutions responsible for environmental management; and training programs on environmental management. The mining environmental action plan, issued in accordance with the above policy, must consider all pertinent sustainable development considerations, such as land acquisition, mine closures, employment and training of locals, development of regional infrastructure, revenue sharing, local participation, and the consultation processes. Issues that must be addressed include information needs and availability, the role to be given to environmental policy instruments and planning tools, and the degree of urgency for reform and adjustment. Organizational issues include the institutional structure of environmental management (sectoral or

central), private sector participation, and functions of environmental institutions.

World Bank assistance on mining environmental reform normally starts by assessing the situation and needs of environmental management in a given country through a Sectoral Environmental Assessment (SEA) and by agreeing to the principles applicable to the social issues included in the mining environmental action plan and the procedures to follow in their administration. Environmental management of the mining sector within developing countries varies immensely, and there is considerable room for improvement in all member countries; general education being a key factor that accounts for such great variation. Some countries have had their legislation in place for decades, while others have begun introducing their laws and regulations more recently. An SEA that considers the elements of environmental management and that assesses the existing baseline data, as well as the policy, legal, and institutional framework, provides a strong foundation as to the priorities of work and the instruments needed for such work. The SEA will help define which mining areas should be given most attention, which environmental problems are critical and, as a consequence, how to sequence the different steps required for environmental reform (including review of regulations, revision of Environmental Impact Assessment (EIA) procedures, strengthening of institutions, and increase in private sector participation).

Once a clear diagnosis of environmental conditions and strategic priorities has been made, World Bank assistance focuses on the drafting of environmental regulations, the drafting of guidelines to address the

social issues included in the mining environmental action plan, the strengthening of the environmental institutions, and the implementation of environmental planning tools. World Bank technical assistance in the regulatory area follows the guidelines discussed above. In the social areas, the focus is on the preparation of guidelines on land acquisition, employment, and training of the population, procurement with local enterprises, revenue sharing, the role of foundations and regional development organizations, local participation, the development of social capital, and the consultation processes. Such guidelines should be region-specific and should be developed with the participation of the community involved. Assistance for the strengthening of environmental institutions normally includes support of the modernization of the environmental baseline information, training for key personnel, and restructuring of the institutions. As for the implementation of environmental planning tools, World Bank assistance focuses on the design and implementation of the EIA process.

### ***Reform and Privatization of State Enterprises***

State-owned mining enterprises were established in many developing countries in the 1960s, based on the double premise that private investors (especially foreign investors) did not act in the best interests of the nation, and that government-controlled mining development could be managed efficiently. Over the past three decades, private enterprises have proven to be far more efficient and competitive than SOEs, as well as more effective at raising capital. Moreover, they have proven better at managing the risks

associated with exploration and development. In addition, it has been proven that private sector investors can be encouraged and regulated to act responsibly and reflect the best interests of a nation through appropriate mineral policy initiatives and efficient legal and administrative procedures.

Mining SOEs are uncommon or absent in almost all successful mining jurisdictions, with Codelco in Chile and Soquem in Quebec, Canada being two rare and successful exceptions. The presence of an enterprise owned by the state that is also engaged in such key activities as administering mineral rights and effecting environmental controls creates a perceived conflict of interest for other players. The importance of equal access to licensing and the minimization of areas reserved for exploration or exploitation by governments or their SOEs cannot be overemphasized. Therefore, a government that maintains SOEs must establish a truly level playing field where the SOEs receive no preferential treatment and have qualified independent management with no political interference, and where the access to mineral resources is non-discretionary. At best, the presence of SOEs should not be part of any country's mining reform initiatives.

World Bank assistance to mining reform in those countries with a significant presence of SOEs focuses on implementing an orderly process of closure and privatization of their operations. Between 1989 and 1997, the state-owned enterprise in Bolivia, COMIBOL, with assistance from the Mining Sector Rehabilitation Project, closed more than 80 percent of the previous operations (which were judged to be unviable) and restructured and privatized the remaining operations, including Colquiri,

Huanuni, Mina Bolivar, and the Vinto smelter. In Zambia, the mining sector technical assistance project assisted in restructuring ZCCM, closing the unviable operations, and privatizing those that were judged viable. In Russia, the Coal SECALs 1 and 2 assisted the privatization of the coal industry by supporting the demonopolization and commercialization of the industry and then the implementation of competitive direct privatization. Meanwhile, a technical assistance loan (TAL) funded privatization-related activities. In cases in which the mining project takes place in parallel to a multisectorial privatization project, the mining project assists so that privatization of the mining component occurs in accordance with the existing framework for such divestitures. In Peru, the Bank assisted in the privatization of the operations of Centromin and Minero Peru.

### III. Mining in the Threshold of the 21st Century and Sustainable Development

#### MINING POLICY: A NEW THREE-WAY PROCESS

As a result of the contextual shift that the mining industry has undergone during the last quarter century, mining policy is increasingly becoming a three-way process involving the companies, the national authorities, and the local (and regional) community. Getting these three-way dialogues started requires careful preparatory work to ensure that the three parties are prepared to contribute to and extract full benefits from the process that they are about to initiate. Such dialogues can be a win-win proposition for the three primary stakeholders – the government, the community, and the company – all of whom stand to gain significantly from the sustainable development of the mining regions.

However, experience regarding the role of the central government in participating in the three-way policy process in a developing country context is still very limited. A few governments have made progress by establishing an enabling environment for private investment in the mineral sector. These countries have provided their mining industries with modern mining codes, stable and equitable fiscal norms, clear, non-discretionary, non-negotiable procedures and regulations, and adequate environmental regulations. Mining companies in these selected countries receive a clear, long-term legal license to operate. Their concern then

focuses on engaging the community in order to achieve the social license that will allow them optimal operating conditions for the long term.

But many developing country governments have not laid the necessary foundations for the three-way process, either by not enacting a modern mining and environmental regulatory framework, or by enacting one that is highly discretionary and subject to continuous negotiations. Such context does not provide the investor with the security of tenure required for long-term planning and affects the view of the investor in his relationship with the local community. Under these circumstances, very few mining companies engage the local communities in a dialogue leading to sustainable development initiatives (as the companies would have to feel comfortable with their contractual terms and with their relationship with government).

#### THE TRIPLE BOTTOM LINE AND SUSTAINABLE DEVELOPMENT

##### *The Components of Sustainability.*

The sustainability of all projects, enterprises, or societies is defined by three fundamental prerequisites: economic strength, environmental sustainability, and social equity. The decisiveness and skill with which the mining industry balances these three imperatives

of its operations and becomes socially acceptable – in the context of the developed and in developing world alike – will be a critical factor in defining the long-term future of the industry. Similarly, the management that the governments of mining countries give to these issues will go a long way in defining not only the enabling environment for the development of their mining sectors but the possibility of receiving ongoing benefits from the sector in the long term.

### ***The Governance Requirement***

Clarity on the goals of the three-way process and agreement on the roles and responsibilities of the key stakeholders in this process is critical in any effort to ensure sustainability. This implies that the expected behaviors of the stakeholders must be agreed upon, so as to safeguard the interests of others. To this end, the stakeholders must agree on procedures for decision making and dispute resolution in order to ensure that affected people will be treated properly. Reaching agreements on these matters provides direction on how to manage these processes, helps the stakeholders recognize constraints, and suggests a means of overcoming them. Most importantly, stakeholder agreement provides the basis for a strong linkage between industry, central government, and the local community.

## **TOWARD SUSTAINABLE DEVELOPMENT BEYOND THE MINE**

### ***Recent Experience: A Hopeful Message***

While mining will continue to be controversial because of its social and environmental impacts – especially at the level of local

communities – the mining industry of the 21st century must continue the work that industry leaders started a decade or so ago and aim at taking a leading position in the development work of neighboring communities. In so doing, mining will continue to demonstrate that the benefits that could accrue to these communities far outweigh the costs, and that these benefits can be more substantial than they have been in the past. Indeed, recent experience points to a new generation of mine enterprise and community relationships whose main objective is to improve the impact of mining activities to the benefit of the local communities.

The recent Canadian experience with mining has established a model regarding the sustainable development of local communities. To begin with, government, industry, labor, aboriginal groups, and environmentalists agreed in the Whitehorse Mining Initiative of 1994 on a vision for the development of the mineral sector with an objective of “a socially, economically, environmentally sustainable and prosperous mining industry, underpinned by political and community consensus.” Subsequent experience has strengthened the Whitehorse objectives of environmental sustainability, community and indigenous orientation, and economic competitiveness. Most importantly, it has highlighted the need to move from a revenue-sharing to a benefit-sharing approach. In other words, sustainable development requires that the stakeholders look beyond the impact of employment, royalties, taxes, fees, and indirect benefits that the mine infrastructure will bring to the region. Stakeholders must participate in the supply of goods and services – initially for the mine and later for all firms in the region – and contribute to

the planning of the infrastructure. This change of approach is of fundamental importance, as the whole cluster of economic activities outside mining but surrounding the mine generates by far the largest portion of the economic and social benefits to local communities and national economies and, in addition, defines the long-term sustainability of the entire mineral sector.

The opening of a mine and the community employment it generates expand the demand for a variety of consumer goods and services in the region. Initially it could include such enterprises and activities as food for mine personnel, retail outlets, hotels, restaurants, bakeries, automotive repairs, and personal, medical, and financial services. Shortly thereafter, it may include the provision of housing, maintenance services for housing and roadways, construction of sheds and simple mine buildings, and inputs such as sand and gravel. As the mine community expands, other types of inputs can be provided, such as vehicle repair, machine shop services, welding, sheet metal work, plumbing, and electrical services. These may be followed by more complex construction projects and into repair and assembly of basic steelwork. Ultimately, when the mine community expands greatly, a growing variety of enterprises may locate there to provide inputs for the mine's activities in the region, later for other regions, and eventually for other countries. In major mining cities, some more complex equipment may be produced. At this point, there will also be a steady expansion of the provision of public goods and services, including higher education, hospitals, and infrastructure services, along with the local government bureaucracy to administer these.

Such has been the history of Sudbury, Ontario, which evolved from a frontier railway and mining town to a significant "mining metropolis" and an important economic center in northern Ontario. It has developed a substantial degree of economic diversification around a mineral-extraction base, as well as a broad range of economic activities of a business service, governmental, health, and educational character. By now, Sudbury has become an attractive and dynamic city that has established itself as a center for technological innovation in hard-rock mining, with a range of minerals-oriented enterprises. The economy has diversified with a series of other contributors and as an educational center, the landscape is returning to its natural state, and the city has become attractive in its healthy natural setting.

The development of northern Saskatchewan on the basis of the uranium mines is much more recent but follows the same general path (after a failed initial attempt to develop the region through crown corporations with a revenue-sharing approach). A second approach followed several years of public inquiry into three key issues: the environmental safety of the industry, the levels of economic and community benefits to the North, and benefits to the aboriginal peoples. While the state remained responsible for a more open, transparent, cooperative, and consultative process, government withdrew from production and was replaced by the private sector. Throughout the 1990s, uranium mining had a major impact on the regional and community development. In addition to the employment and taxation they had already been receiving, the region and community benefited from procurement for the mines, enterprise development, and strong growth of community and native-

owned businesses, development of social capital, institutional strengthening of the community planning frameworks, and improved environmental protection. In addition, local residents and others are now applying the skills, procedures, and practices initially obtained from uranium mining to other sectors, including forestry, tourism, health care, and education.

### ***Applying the Canadian Lessons in Developing Countries***

The experience in developing countries of large mines that undertake adequate community development efforts confirms the initial phases of the above sequence. The pattern of development of neighboring communities of such mines located in the Andean region is similar to the early stages of those in Canada. Initially, local community members tend to fill the lower skilled jobs and provide unsophisticated services to the mine. As the community development work begins to mature and the local service providers incorporate enterprises, these begin by providing unsophisticated services and then entering into activities such as vehicle repairs, machine shop services, welding, sheetmetal work, and electrical services. At a later stage, some more sophisticated, national-level service providers, such as repair and maintenance of heavy equipment, will open a regional shop. Since the start-up of the Candelaria mine in Chile, many companies have opened offices and shops in nearby Copiapo. Something similar has occurred in the neighboring town of Cajamarca since the start-up of the Yanacocha mine in Peru. The result is a significant growth in purchases from local businesses and the appearance of several small local subcontractors in the specialties noted above.

Escondida has advanced one step beyond, as some of its local suppliers and providers of services have entered the national stage in Chile. All these mines have made significant efforts to train local populations.

The introduction of mining in indigenous areas creates important potential benefits but also a number of challenges. Some of the benefits are the same as those that mining generally brings, including employment, taxation, infrastructure development, and local entrepreneurial development. But indigenous communities also have the possibility of capturing some additional spin-off benefits from the local purchases of mining companies, as indigenous peoples may benefit in the future by systematically developing the relevant mining skills so that they can dominate mining activities in the areas where they come from. Ultimately this should include partial or complete ownership of some mine enterprises. Their geographical proximity to the mineral resources and emotional proximity to the affected people should facilitate this. Nevertheless, it is important to note that the initial stages of the introduction of mining to an indigenous area may also usher in some social problems, as outsiders may bring alcohol and introduce foreign lifestyles. Also, pollution may damage the environment, and traditionally reserved areas may be disturbed. Yet those governments that have established credibility in their commitment to reform and the protection of the environment have proven capable of managing the process, largely by making use of the trilateral dialogue with industry and the affected communities.

# APPENDIX A

## THE EXPERIENCES OF THE 1980s AND THE MINING REFORMS OF THE 1990s

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After more than ten years in which countries in all regions of the world introduced major reforms to their mining laws with varying degrees of success, the Latin American legal reforms appear to have had the most impact in attracting investment in exploration and mining. The Latin American mining legal reforms followed a conceptual scheme along the lines of the Chilean Foreign Investment Statute DL600 of 1974 and the Mining Code of 1983. DL600 established the non-discriminatory treatment of foreign investors, free access to all sectors of the economy, and minimum intervention by government in the activities of the investor. It also enabled investors to obtain stabilization agreements for the legal, fiscal, and foreign exchange provisions applicable to their investment.

The Chilean Mining Code aimed at creating a market for mineral rights by providing clear, non-discretionary norms and transparent procedures. To this end, the Code included the following major features. Exploration and exploitation concessions are real property rights. Concessions are freely transferable, mortgageable, and inheritable, with no requirement of government approval. Concessions are awarded to the first eligible person who requests an available area, on a first come – first served basis. Restrictions on eligibility are minimal. Only the holder of an exploration concession can apply for an exploitation concession and is not required to demonstrate a discovery to do so. Concessionaires can exploit all concessionable minerals within

the property. Exploitation concessions continue in effect for as long as the holder continues paying his concession fee; no minimum work or investment requirement applies. The Code was complemented by the implementation of a modern mining cadastre, which provides accurate information on the status of all areas, strictly applies the first come – first served principle, and strictly applies the full transferability of the titles.

Of the countries that adjusted their laws along the lines of the Chilean approach, Peru introduced two additional innovations that considerably simplified the administration of mineral rights. The first was a national grid system to facilitate the identification of concession boundaries and avoid overlapping concessions. The second was a single, unified concession for exploration and exploitation. To discourage the holding of the unified concession beyond a reasonable period, Peru imposes a monetary penalty on those concessions that do not meet production requirements by the eighth year. These innovations have proven to be successful and are being incorporated into the more recent mining reform initiatives.

The Asia and Pacific region has lagged in attracting mineral exploration investment in recent years. However, Indonesia and later Papua New Guinea and the Philippines initially succeeded in attracting major foreign mining companies to make substantial investments in exploration and mining by standardizing the contract terms through which they provide security and stability of

terms. The Indonesian approach differed considerably from the Latin American approach; the mining law does not allow foreigners to obtain exploration or mining licenses. For this purpose, standardized Contracts of Work (COW) were established, under which foreign companies explore for, develop, and exploit the mineral resources as contractors for the government. Each COW is approved by Congress, giving it the force of law; this provides investors with stability and predictability of the applicable rules. The COWs are revised only every few years, thereby avoiding the time and cost of negotiating individual COWs and facilitating the administration of the contracts. Each version or "generation" of the COW offers investors a package of rights and obligations covering all activities required for the operation and also fixing tax and foreign exchange rules that the mining companies have found to be acceptable for major investments. Yet the COWs are not transferable or mortgageable. The government exercises considerable supervision over all phases of a project and retains discretion on key issues, such as the requirement of local participation in a project.

Changes introduced into the eighth generation COW in 1998–2000 were not accepted by the international mining companies. The situation was further complicated when the government presented a draft mining law of 2000, which resulted in the government being forced to step back to the seventh generation COW.

In Africa, the mining laws enacted in Botswana in 1976 and Ghana in 1986 granted the Minister responsible for mining a large amount of discretion to grant or refuse mineral rights to private applicants and to set their terms, as well as to supervise all facets of the operation. Both laws require that the state be provided with a free equity interest in each project and stipulate prior written permission of the Minister for the transfer of a mineral right. Both also require applicants to demonstrate their technical and financial capabilities, to submit extensive plans, and to demonstrate the existence of a commercial deposit in order to get a mining license.

Despite these restrictions, Botswana, Ghana, and Indonesia achieved a respectable amount of success in attracting private investment into their private sectors, primarily because the three countries have very attractive geology, implemented sound macroeconomic policies, and their respective mining laws were reasonably administered. Their legal frameworks worked well (in the 1980s and through the mid-1990s) with companies that had sufficient capital to spend on up-front negotiations. However, they did not encourage companies to take exploration risks, a limitation that has substantially slowed the growth of mining in these countries – and in countries which followed their legal scheme – in the late 1990s and early 2000s.

## APPENDIX B

### THE KEY ROLES OF THE PMIs IN MINERAL RESOURCE MANAGEMENT

#### ***Mining cadastre and management of property rights.***

The establishment of a mining cadastre, which integrates the regulatory, institutional, and technological aspects of mineral rights administration, is the cornerstone of a mineral resource management aimed at optimizing the contribution of mining to regional development. The granting of mining titles, founded on transparent procedures and on unequivocal location and limits of mineral properties, guarantees the security of tenure for investors. World Bank – supported technical assistance programs to set up modern cadastral systems, as completed for example in Argentina, Bolivia, Ecuador, Peru, Madagascar, and Mauritania, have led to many improvements. Computerized granting and monitoring procedures, strictly mirroring existing regulations, speed up processing times and limit the opportunities for “arbitrary” interventions. Set-up of mining rights data bases, linked to the procedures management system, allow the accurate and precise location (using GPS and GIS technologies) of mining properties in real time, a key factor for security of tenure and avoidance of legal conflicts. In addition, displaying the information on the Internet allows the government, as well as communities and investors, to foresee and mitigate potential conflicts between mineral resources exploitation and other land uses, including conservation of protected areas (see in particular the case of Ecuador, <http://www.mineriaecuador.com>).

***Geo-scientific information infrastructure.*** The provision of strategic mineral resource information through a national Geological Survey Organization (GSO) constitutes an important mandate of a modern state. The World Bank has long recognized the importance of GSOs as “enablers” to provide the required data to make well-informed decisions regarding sustainable land and resource use. World Bank technical assistance programs in most cases include funds to strengthen GSOs, develop a national multi-disciplinary geo-scientific data base, set up a related information system, and publish and disseminate the information through publicly available maps, reports, data bases, books, brochures, articles, workshops, and conferences. They often include regional

data acquisition. The availability to all stakeholders of modern and reliable geo-scientific data not only enhance the capacity to assess and manage mineral resources, but can also be applied to other areas, such as agriculture, forestry, natural hazards, environmental and health risk analysis, conservation, and land-use planning. Good examples of such programs can be found in Argentina, Bolivia, Ecuador, Ghana, Madagascar (scheduled), Mauritania, and Mozambique.

#### ***Environmental and social management.***

Environmental and social impacts assessments for mining activities have become a requirement in a growing number of countries. Since the early 1990s, the World Bank has supported the development of an appropriate regulatory framework and an institutional capacity to evaluate environmental impact assessments (EIAs) and to monitor the environmental performance of the sector. While still at an early stage of conceptual development, World Bank assistance now also includes capacity building to assess and monitor social impacts, as well as ways to involve the civil society in monitoring environmental and social impacts. This participatory approach strengthens the credibility of such processes. Typical products include the set-up of sector environmental offices as an interface between the operators and central environmental institutions. A successful case is Argentina, where sector decentralized environmental units are involving other sectors in EIA processing; the development of EIA procedures; and monitoring routines linked to an Environmental Information and Management System (as in Argentina, Ecuador, Madagascar, Mauritania, and Mozambique). More recently, World Bank programs have included involvement of NGOs and civil society organizations in monitoring, as well as the development of guidelines on the relationships between operators and communities (as in Ecuador). In addition, the gathering of environmental baseline information and its public availability have proven to be very useful for operators, government, and civil society alike, both for development planning and for monitoring of sector performance (as in Argentina, Bolivia, Ecuador, Madagascar, and Mauritania).

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