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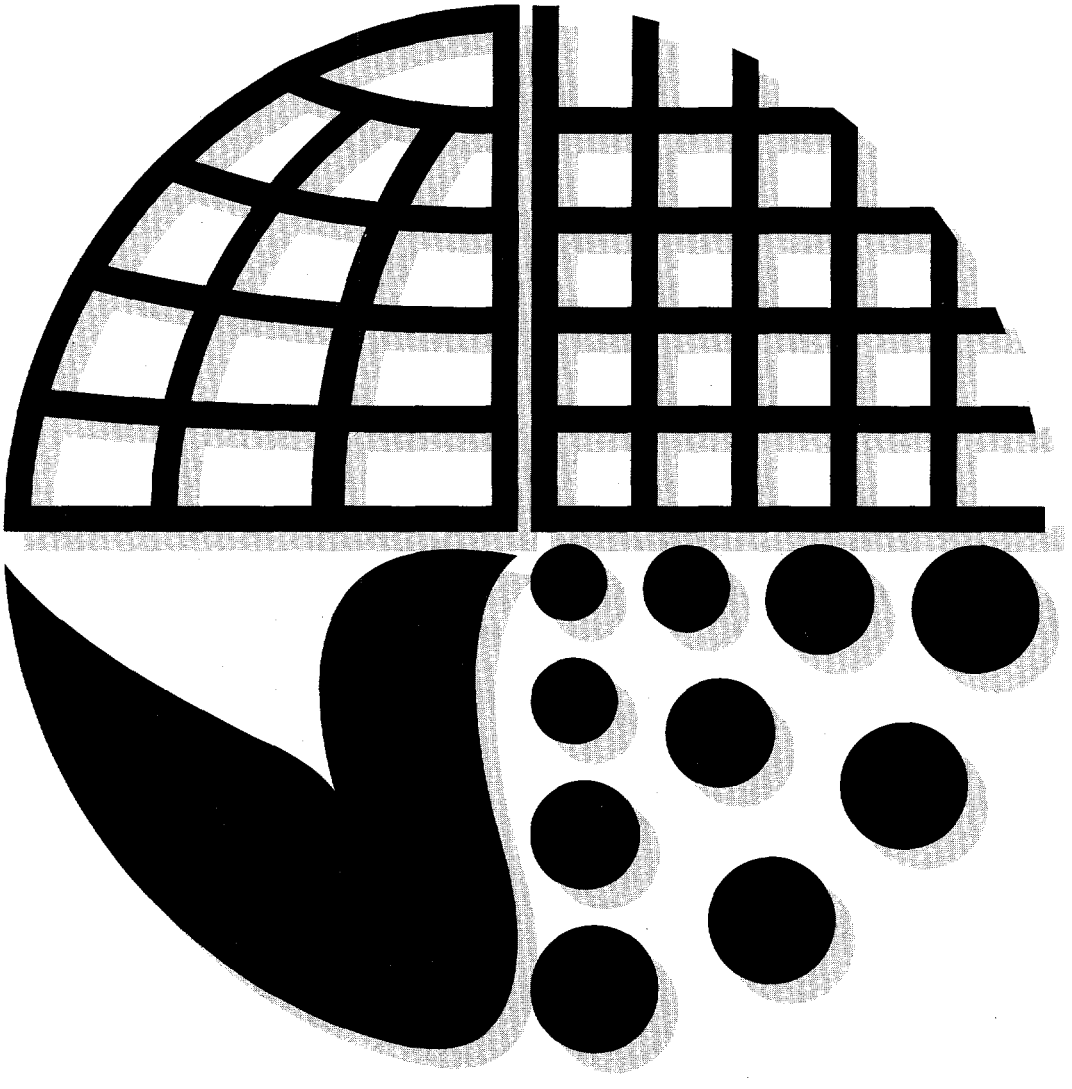
DEVELOPMENT, ENVIRONMENT AND MINING

ENHANCING THE CONTRIBUTION OF THE MINERAL INDUSTRY TO SUSTAINABLE DEVELOPMENT

POST CONFERENCE SUMMARY



WASHINGTON DC
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The International Conference on Development, Environment and Mining convened June 1 - 3, 1994 in Washington, DC. It brought together close to 300 senior level representatives from international agencies, developing and industrialized nations, industry and small mining, academia, non-governmental organizations and other stakeholders in society to share ideas, perspectives, information and solutions with one another regarding mining and sustainable development.

The conference was co-sponsored by three international agencies: the World Bank, the United Nations Environment Programme (UNEP), the United Nations Conference on Trade and Development (UNCTAD), and the International Council on Metals and the Environment (ICME), an international environmental non-governmental organization. His Excellency Mr. Henrique Brandão Cavalcanti, Minister for the Environment and the Amazon of Brazil, was President of the conference.

This summary document outlines the broad themes and conclusions of the conference. It is the intent of the co-sponsors to encourage continued discussions and efforts to define and follow environmentally sound sustainable economic development. Recognizing that the many expert panellists speaking at the conference have written extensively on topics that could be discussed only briefly in a two and one-half day conference, the co-sponsors encourage conference participants and other interested readers to contact the speakers for additional writings and information.

Conference Overview

The mining and metallurgical sector is a major contributor not only to the material needs and economic health of the industrialized world, but also to the development and economic growth of many developing nations. It also has the potential to be prominent in other nations. At the same time, however, there are perceptions that the environment is being endangered by the activity of this industrial sector, notably in developing countries.

The objective of the International Conference on Development, Environment and Mining was to further the public debate on issues relating to the contribution of mining and metallurgical sectors to the development and environmental goals of society, particularly in developing countries. The conference participants brought to the event a strong sense of constructive dialogue and sharing of information and progress in environmental management in the mining sector. Moreover, the conference identified for future discussions many of the developmental and environmental challenges yet to be resolved.

Conference President Mr. Henrique Brandão Cavalcanti, Minister for the Environment and the Amazon of Brazil, concluded the event with a summary of the major points made in the plenary sessions, discussions and workshops:

- Mineral resources can generate substantial wealth and become a powerful catalyst for economic development. To realize these benefits, mineral economies need to establish an administrative, fiscal and regulatory framework conducive to mineral exploitation and to pursue balanced and flexible macroeconomic policies, notably in relation to the exchange rate and the management of mineral revenue.
- The role of government in mineral-rich countries should not be to own or operate mining enterprises but to create an enabling environment that allows companies to be internationally competitive.
- The approaches taken by governments to environmental policies for mining activity have shifted away from centralized decision making, detailed regulations and command-and-control approaches toward the setting of objectives, clear standards and the provision of information.
- Environmental regulations do not act as a disincentive to investment, provided that the regulations are realistic, transparent and stable.
- Community issues have been increasingly highlighted over the last decade in the context of sustainable development. Mining companies should respond to the development needs of countries and develop approaches that take into account local traditions and values.

- The lack of basic geological and mineral resource data is a fundamental constraint on national development. Efforts are required on the part of intergovernmental organizations, national governments, industry and the community to strengthen the contribution of mineral resources information to sustainable development.
- The objective of rehabilitation of mine sites should be to restore them to a self-sustaining ecosystem that is as close as practical to its original state prior to mining activity. There is a need for mechanisms that ensure the availability of funds to finance rehabilitation.
- Principles of environmental management are being adopted and the industry is making rapid progress. They are seen as a vital part of efforts toward continuous improvement. The management systems being adopted depend on regulations and on corporate cultures. These systems are part of the industry's efforts to demonstrate that mining is compatible with environmental protection.

Presentations and discussions underlying the above points were conducted under eight different themes. A concise summary for each theme is provided in the following pages. The co-sponsors extend their appreciation to the individuals who served as rapporteurs and prepared these summaries.

SESSION 1

The Management of Mineral Economies

Why do mineral economies, on average, tend to grow more slowly than other economies? What is "Dutch Disease" and how can it be avoided? Should mineral economies diversify and how? What has been learned from the policies pursued in mineral economies? How should governments manage budget income from mineral production?

Mineral resources can generate substantial wealth but they are depletable and non-renewable. For sustainable development, these resources need to be managed so that the wealth they generate can effectively substitute for the depleting mineral asset. This objective is especially important in the management of those countries largely dependent on minerals for their economic development.

Mineral wealth does not arise by itself: it is created through the application of various factors of production - workers, investors and company management - and with the concurrence of the community at large, represented by government, and the owners of the mineral resource. All of these interests seek to benefit from mining activity and to share in any surplus revenue - or "mineral rent" - which remains after the various direct and indirect costs of production have been accounted for. Since mineral deposits are a part of a nation's patrimony, government has a duty to capture mineral rent if it exists. In some countries the state monopolizes rent by directly controlling mining operations. However, private enterprise is increasingly playing a larger part in mineral production worldwide, and, in this context, the primary role for government is to institute an efficient fiscal policy with the double aim of encouraging the realization of potential mineral rents and ensuring that the bulk of these are subsequently captured through taxation.

This is not an easy task. It is complicated by the highly variable nature of mineral rent, as mineral prices and other factors change; by the difficulty of defining and including some elements of production cost - notably rehabilitation charges and the appropriate rate of return to allow on capital that takes due account of the level of investment risk. When such costs and risks are high, the amount of rent that accumulates to government over the limited lifetime of the mine may be very little. Government can expect to capture the most amount of rent in a situation where low production costs are associated with high quality mineral deposits and where investment risk is low. However, given the increasing competition among countries to attract investment funds, government may be obliged to sacrifice some rent to retain investors.

The management of economies that are highly dependent on mineral exports can become problematic because of a condition known to economists as "Dutch Disease". This condition occurs when a new mineral discovery or an increase in mineral prices creates a mineral boom. In this situation, the exchange rate tends to appreciate, causing other tradeable sectors of the economy - notably agriculture and manufacturing - to become uncompetitive and eventually to decline; mineral wealth is dissipated and the outcome over the longer term, in the absence of an effective policy response by government, is stagnating and even negative growth for the economy as a whole. This situation has occurred in a number of mineral economies, some of which have been obliged to undertake extensive structural adjustment programs to address the problem.

Some countries have nevertheless been successful in expanding the mineral sector while diversifying and improving the economy as a whole. In Chile, for example, mineral production, led by copper, has greatly increased over the past decade and this expansion has had a significant positive impact on the domestic economy downstream; at the same time, much new investment has occurred in other sectors, especially agricultural production and processing, resulting in a stronger and more diversified economy with a reduced dependency on mineral exports. These achievements are due to a number of factors including: high quality mineral deposits; a stable mining law and an attractive Foreign Investment Statute; a favourable geographical situation; an open trading policy; and a stable economic, political and social environment. It remains to be seen whether the diversification process under way in Chile will lead to sustainable development in the long term, when the mineral sector may no longer contribute so much to the national economy.

The Chilean model is not applicable to all mineral economies. Some of the factors underlying Chile's success, such as high mineral quality and favourable geographical situation, may be lacking in other countries. Other countries may also differ from Chile regarding their level of income, size of population, agricultural resource endowment, etc., and these factors can severely limit the options for diversification and development of their economies. Moreover, new remedies for Dutch Disease may be needed to meet the changed economic, social and political conditions that some mineral economies now experience as a result of the implementation of structural adjustment programs.

In conclusion, mineral economies need to take a proactive approach to economic management. While details will differ according to the specific circumstances of each country, the general approach should include: (i) the careful oversight and eventual encouragement of mineral exploitation through the

institution of a stable administrative, fiscal and regulatory framework; and (ii) the pursuit of a balanced and flexible macro-economic policy, especially with regard to the exchange rate and the stabilization of mineral revenue flows, in order to mute the potential impact of Dutch Disease on the economy. With these policies in place, mineral economies will be in a better position to ensure that their mineral wealth is effectively converted into the lasting capital needed to support a broad-based process of sustainable development.

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Public and Private Sector Roles

Is there a rationale for government participation in mining? What are the processes of privatization and what lessons can be learned from experiences to date? To what extent do environmental and social liabilities constrain privatization? In the event of privatization, which liabilities should be transferred when ownership changes occur? How can private sector profit objectives be more compatible with social and environmental responsibilities?

Over the course of the past several years, the roles of the public and private sectors in the mining industry have changed significantly. In most countries around the world, the state is assuming a posture of regulating activities in the sector, leaving the development and operation of mines and metallurgical plants to the private sector. This process of changing roles has many implications, as examined below.

The main role of the government should be to establish and maintain a supportive "enabling environment" that would allow private companies to be competitive in an international market. In its role as regulator, the government should take the initiative for:

- establishing a fair, consistent and efficient legal framework;
- creating and maintaining stable and supportive economic policies;
- promoting a solid technical infrastructure, both locally and on a national level;
- developing appropriate national and local government agencies responsive to the needs of mining enterprises;
- assisting in the development of policies and programs which will both utilize existing resources and personnel, and eliminate ineffective practices;
- encouraging diversification with the goal of eventually removing government subsidies;
- encouraging foreign investment, and welcoming new foreign skills and structures where appropriate;
- working with local financial institutions to improve access of mining companies to local loan sources; and
- ensuring that investors have equal access to the nation's mineral resources.

In view of the disappointing economic and financial performance of many state-owned mining enterprises, governments are adopting the position that the state should not hold any ownership rights in mining companies and should act as neither operator nor employer. State ownership carries the risk of assuming operating losses or of granting implicit or explicit subsidies and/or preferential treatment

to mining enterprises. By taxing the company rather than owning it, the government participates in profits without the risk of assuming losses.

Because of these reasons, divestiture by the state of its ownership interest in mining operations (privatization) is being pursued vigorously. Experience with simply "restructuring" enterprises has proved mixed. Increasing the efficiency and competitiveness of state mining ventures by restructuring them necessarily entails the same painful social consequences as privatization. Also, unless the ownership structure itself is changed, experience has shown that "reformed" enterprises after a certain lapse of time once again become subjects of political interference and exhibit many of the old inefficiencies.

To realize the benefits of privatization, governments must ensure that companies have the capacity to successfully compete in an international market. State-owned companies to be privatized should be valued in terms of their economic potential and the government should seriously consider only those investors who can demonstrate interest in long-term profits. Responsibility for historical environmental liabilities is a major issue and the experience of a number of countries indicates that governments should assume responsibility for some or all past environmental liability. From a company perspective, existing social liabilities may be as worrisome as historical environmental liabilities. These include problems such as unemployment and possible social unrest, costs of worker retraining and public opposition to privatization.

In order to provide a stable atmosphere for mining investment and development, governments cannot ignore public attitudes. Especially in mineral-dependent economies, mining issues have the potential to elicit emotional public responses. The government should concentrate on good public relations and not neglect to take into account public perceptions, both positive and negative. Finally, after the transfer of rights or ownership is completed, the government must be able to maintain the right economic and social conditions to allow companies and the government to recoup their long-term investments.

International practice thus far with mining privatization represents a wide variety of national interests and experiences. In Germany, for instance, a single state agency is overseeing the privatization of enterprises in the former East Germany, including some mining enterprises. In Indonesia, the government has recently restructured a state-owned company and put it on the market for sale to private investors. In Bolivia, where strong public sentiment holds that the nation's mineral resources belong to each and every citizen, the

privatization process has been more complex. Instead of privatizing completely the state-owned mining company, COMIBOL, the government sold 50 percent of its share equity to private investors, to whom it also gave a management contract to run all of the company's mining operations. The remaining fifty percent government equity in COMIBOL is being distributed to individual retirement accounts of all Bolivian citizens.

In contrast, territories of the former Soviet Union must address complicated decentralization issues as well as the transformation of a huge natural resources industry which had been run for many years without regard to market conditions. Effective privatization is also hampered by conflicting organization responsibilities and deeply entrenched economic, social, geographic and climate problems. Under these circumstances, privatization may take a generation or more.

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Government Roles in Environmental Protection

What policy instruments can be used to improve environmental performance? Where should responsibility for environmental regulation and enforcement lie in government, and what mining-specific skills are required? Are different standards for large and small-scale operations appropriate or necessary? What are the advantages and limitations of present approaches to the development of regulations, project planning and approval processes?

Government roles in environmental protection are gradually evolving in response to changing perceptions of their involvement in mining operations themselves, and as experience with earlier control systems is evaluated. In particular, the general movement to privatization of mining operations has resulted in a renewed focus of governments on their control function rather than on their status as operators.

National control systems should be developed around the specific local conditions (ecological and social) and values that prevail, and no worldwide prescriptions are possible. It is nevertheless useful to study examples in countries or environments where some of the conditions are similar.

There has been an observed shift by governments away from centralized decision making on control procedures, the use of detailed, prescriptive and inflexible standards, and excessive reliance on command and control types of regulations.

Instead, increased focus is now on governments to:

- establish clear and explicit environmental objectives;
- set realistic standards that are practical to apply;
- create incentives;
- provide information;
- strengthen Environmental Impact Assessment (EIA) processes, with subsequent auditing of performance of companies;
- encourage the establishment of comprehensive environmental management systems; and
- establish mining as a partnership, including local communities, government, mining companies and consultants.

There is a general consensus that environmental regulations are not a disincentive to investment by reputable companies if they are based on environmental needs, are results-oriented, practical to implement and reasonably stable. However, inefficient bureaucratic systems, multi-layered government and overlapping authorities can be a disincentive.

With the government withdrawing increasingly from ownership and operation, the role of mining ministries is also changing, and this affects in turn their relationship with environmental agencies. Mining ministries are focusing more on overseeing the operations of companies, including environmental performance.

Resource agencies, such as Departments of Mines, have a major role in overseeing environmental management in the mining industry. The resource agency has the expertise, staff in the right location and a real interest in promoting responsible environmental performance. It is for specialist environmental agencies to define the thresholds of acceptable environmental impact, audit actual impact and assist the various publics in their environmental functions. It is most desirable that both agencies have specific expertise in mining and environmental matters.

The standard-setting process relies on the existence of adequate environmental resource information as well as a clear articulation of social values (i.e., environmental expectations) by the community. The transfer of numerical environmental standards from another place is problematic as neither the ecological nor the social conditions will be the same. On the other hand, industrial projects cannot always wait for the information-gathering and standard-setting process to be completed. Accordingly, many countries need further assistance in clarifying and developing appropriate procedures and methodologies for standard setting that are valid in their particular circumstances.

For a given location the same standards should apply to large and small operators, as these standards are based on ecological factors. However, governments will need to adopt different implementation approaches depending on the size and nature of the mine operator. Small operators will usually require information, training, support services and technical assistance if they are to be able to comply with the general regulations. Large operators have the technical and managerial resources to be able to determine their own compliance strategy, and need instead a clear, transparent and stable set of environmental standards at which to aim. These larger projects will often be individually assessed through an EIA process and operate to site-specific conditions. In a high-risk industry such as mining, governments may demand the lodging of bonds or other financial securities to insure post-mining site rehabilitation.

In comparing standards among countries, it is important to note that the objective of regulations is to achieve high environmental performance in all countries. High performance can be achieved by different combinations of standards and control systems that suit the enforcement capabilities of countries. Insofar as environmental

standards are often minimum standards, companies should aim at a superior environmental performance that minimizes as a matter of course the impacts wherever possible.

The environmental problems arising from very small mining operations, including artisanal mining, require specific actions by the authorities, with possible assistance also from companies and institutions. Such actions could include the encouragement of tribute (sub-lease) arrangements with companies, encouraging cooperatives, controlling the sale and distribution of mercury, advising miners to locate in appropriately designated areas, and assisting in rehabilitation.

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Mining and the Community

What are the relationships between mining and metal-producing activities and the local communities? Under what circumstances does the local community feel there are net benefits to itself and its people? What are the roles of the various stakeholders—government, community groups and industry? What facilitates mutually beneficial conditions, and where has this worked well?

Increasingly over the last decade, sustainable development is being addressed from the perspective of the local communities, as well as that of national economies. Mining can contribute to the objectives of sustainable growth and environmental protection; however, the approaches to achieving this will necessarily differ from one community and society to the next.

Three different but successful approaches toward achieving constructive partnerships with local communities demonstrated the ways in which communities and mining companies are already working together to provide economic development through mining activity, addressing environmental considerations and societal and cultural needs. Several common features emerged from presentations and from discussion of other approaches:

- Mining companies should respond to the development objectives of countries, notably in industrially developing nations, by using practices and technologies which take into account local cultures and customs, as well as economic and environmental needs.
- Contributions to the social and economic development of the communities where operations are located need to be compatible with local needs and wishes. In addition, endeavours should be made to mitigate adverse effects in these communities when operations are reduced or terminated.
- The interests and values of individuals and groups whose lives or lifestyles may be affected by exploration, mining and processing should be respected. This includes the importance of animals and plants to people in areas adjacent to operations.
- Certain areas may have particular environmental, recreational, aesthetic, cultural or religious values, as well as resources and development potential. All of these factors need to be considered, in addition to the economic, social and other potential benefits resulting from development.
- Conflicts in relationships between mining and the community have often reflected interventions by external single focus or special interest groups. A properly managed dialogue should

anticipate this and seek to include, from the outset, all who may be affected by the mining activity.

- Community involvement strategies to promote favourable conditions for local economic sustainable development should always be entertained and reinforced. These efforts should not affect the economic interests of the companies and should be carried out in coordination with the efforts of public authorities, which have the first responsibility for meeting community needs.
- Diversification of the local economy in anticipation of mining depletion, which is a consideration for communities and societies at all stages of development, may be perceived in lesser developed areas as more important than environmental conservation. In the long term, however, and with economic development successfully achieved, resolving environmental problems is likely to become the first priority.
- The modern mining industry generally accepts the importance of properly and responsibly managing their operations and products. Companies must take measures and implement appropriate community involvement approaches in current and future activities to foster environmentally sustainable economic development of lasting benefit to all of their stakeholders, including those in their local communities.

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Investment and Taxation

What attracts mining investment? How are environmental considerations taken into account? To what extent should environmental costs be taken into account in fiscal policies and what forms of taxation are most conducive to economic efficiency? How can governments best optimize the benefits of mining investments? What are some of the typical fiscal instruments used to secure revenue streams and what has been the historical track record? What are some of the institutional and interest group constraints to mining investment?

As countries open exploration and development of their mineral resources to the private sector, investors now face more choices of investment than ever. The recent experience of countries that have attracted significant exploration and mining investment shows that new investments go to areas with favourable business climates and competitive fiscal regimes. Consequently, the ability of a country to attract mining capital and to optimize the benefits of mining operations will assume an increasingly important role in mining development. This raises two related questions: (1) What is required to attract mining investment? and (2) What appropriate fiscal tools can the government use to capture an adequate share of the mining rents without scaring away new investment?

Experience shows that mining investment can be attracted by effectively addressing the following key factors that influence investment decisions:

- **Stability of the country:** investors are attracted to countries that have a stable government and an established record of minimal social disruption, expropriation and corruption.
- **Business climate:** investors are concerned about discrimination between local and foreign investors, restrictions on flow of capital, access to foreign exchange at market rates, limitations on exports, freedom to hire and fire workers, and the existence of local majority ownership rules.
- **Geological potential:** investors look for countries with good mineral prospects. They are concerned about obtaining mining rights and permits in a timely fashion, transferring and trading these rights, and obtaining security of tenure.
- **Operating conditions:** investors value countries that possess an adequate pool of well-trained workers, good infrastructure, and access to raw materials and supplies of mining-related goods and services.

Good geological potential alone will not stimulate mineral development if the existing policy and regulatory framework does not create a hospitable environment for mining investment. The

following are recommendations to improve the investment climate: the procedures for granting mining rights should be simplified and transparent; security of tenure, the right to mine in the event of successful exploration, and the transferability of the mining title should be guaranteed; minimum work requirements should be set so as to encourage the timely development of mineral prospects; regulations should guarantee access to foreign exchange to mining companies; and restrictions on the ability of companies to do business should be minimized. While in general practice ownership of minerals is to be vested in the state which represents the nation at large, a topic that may require further study and discussion is private, instead of state, ownership of mineral resources.

Small and medium-sized companies, which are more flexible than large companies, are increasingly taking the lead in providing private risk capital for exploration and mining in developing countries. Even though the relative success of flow-through shares to raise exploration funds in Canada is a matter of debate, the applicability of such a financing mechanism in developing countries could be investigated.

Establishing an appropriate mining fiscal regime requires a delicate balance between the interests of the mining company and those of the state. The regime should be aimed at dividing rents equitably between the stakeholder groups. Investors need to know in advance the taxes they will pay and the basis on which these taxes are assessed. They also prefer tax regimes that have the following attributes:

- **Stability:** investors prefer a tax package that is immutable and stable over the long term.
- **Neutrality:** investors favor earnings-based taxes which do not distort investment and operating decisions.
- **Competitiveness:** the effective tax burden should be competitive with the terms and conditions of taxation offered in other countries.

It is necessary to stress the need for a long-term approach to taxation as opposed to short-term incentives. The competition to attract investment through tax rebates and other incentives may backfire if taxes fall below a level where the country may no longer gain from mineral extraction. Windfall profit taxes are seen by investors as a disincentive since they cap upside gain potential without minimizing downside risk. Direct taxes such as profit, dividend and cash flow taxes should be used instead of input- or output-based taxes. Some indirect taxes such as sales taxes on consumer goods, personal income taxes, social security and excise

taxes can be alternative sources of fiscal revenues which do not affect a company's effective tax burden. The tax regime should also have provisions for setting up a reclamation reserve.

It is generally agreed that government participation in mining projects, especially in the form of free equity, can be a major disadvantage to private sector mining investment. First, there is an obvious conflict of interest when the government is a shareholder and a regulator of the mining business at the same time. Secondly, free government equity does not necessarily result in dividend payments and could limit the ability of the company to make capital investments in modernization or expansion. Thirdly, free equity could raise the perceived risk of new projects and thus the investor's required rate of return.

However, where the national geological survey has identified orebodies, government can and should require compensation for the detailed exploration and delineation of the orebody. Such compensation is generally negotiated and could take the form of free equity and/or up-front payments or some other combination of remuneration. Also, if the government has provided infrastructure or some other contribution to the project it could become a partner in the venture. In this event, the government may be more disposed to share the risks and rewards of the operation with the private partner and would be less likely to take unilateral decisions that go against the interest of the enterprise. However, the government should not be in the business of managing mining operations and efforts to maximize revenues should be through taxation rather than equity participation.

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SESSION 6

Information Needs for Resource Decisions

What information on mineral resources is needed for decisions leading to sustainable development? How can governments best manage mineral resource information? What information systems and techniques are available and at what cost? Should the depletion of mineral resources be reflected in national accounts, and, if so, how?

Basic mineral resource data are essential to support exploration activities and good geological information can be used to attract foreign investment and as a basis for governments' negotiations with investors. In the broader context of sustainable development, mineral resource data are necessary for resource assessment and planning, including the planning of various kinds of development infrastructure, and for the establishment of baseline data needed for environmental impact assessments and environmental guidelines. Moreover, knowledge of the extent and quality of mineral resources can help to value them as national assets and to ensure that the capital represented by these resources is managed properly.

In spite of these fundamental needs for mineral resource data, national geological organizations, particularly in developing countries, are usually undersupported with respect to funds, personnel and equipment. As a consequence, primary data generation is often inadequate, data are not disseminated and the existing information is often not easily accessible. This situation severely limits not only the development of the mineral sector but also the potential contribution of resource information to national development.

The assessment of mineral resources is a dynamic process which must take into account technological innovation, geological reinterpretation, evolving social needs and changing social priorities. Thus, mineral resource information must be continually reviewed, updated and reassessed as a result of: technological innovations which increase reserves by making the exploitation of sub-marginal deposits possible; reinterpretations of existing data in the light of evolving geological knowledge; and changes in social and economic conditions and in development priorities. Nevertheless, since it is always possible in principle to improve the information, a balance must be struck between the need for data and the costs of data acquisition.

Policy choices for sustainable development are increasingly made on the basis of comprehensive data drawn from a variety of sources and disciplines. These data have to be expressed in a common denominator in order to allow the balancing of different interests against each other and the evaluation of alternative development strategies. To this end, natural resource accounting methods and

concepts have developed rapidly in recent years. They now provide a powerful tool not only for the measurement of natural resource endowment and use in economic terms, but also for defining the costs and benefits of development options. Resource accounting methods allow the measurement of a nation's total wealth and its composition. Policy options can therefore be assessed with a view to identifying those options that yield the largest increase in wealth, whether in the form of natural resources, man-made capital or human capital.

To strengthen the contribution of mineral resource information to sustainable development, efforts are required on the part of all stakeholders - intergovernmental organizations, national governments, industry and local communities.

- Intergovernmental organizations, such as the United Nations and the World Bank, should support the strengthening of institutions and human resources in developing countries for the purposes of generating, collecting, analyzing and distributing basic geological data. These organizations should also strengthen their support for the development and application of resource assessment activities.
- Governments should facilitate the use of basic resource data and promote resource assessments in the overall planning and policy formulation for sustainable development. This necessitates a policy of open access to basic geological data and increased efforts to make such data available to potential users.
- The mining and exploration industry can support governments in their basic data collection activities by making available basic geological data, supporting capacity building and participating, where appropriate, in resource assessment activities which contribute to the overall resource development of countries. Industry should see this undertaking as pro-active.
- Local communities and non-governmental organizations can help and should be involved in clarifying political objectives, setting priorities and promoting discussion of basic issues.

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Environmental Liability and Site Rehabilitation

What environmental liabilities arise from mining? How can proper site rehabilitation be ensured? What provisions should be required to ensure effective remediation? What economic instruments can be used to influence environmental management? How do industry, governments and financial institutions propose to resolve liability arising from past mining operations and from present and future activities?

Important objectives of a rehabilitation programme are protection of public health, and the return of the site and its surroundings to a sustainable ecosystem. Final site standards should reflect ecological needs at the site, as well as social expectations and practical realities.

Final standards and financial liability need to be clearly established before investors are prepared to assume any site responsibilities. Where no national standards exist, companies should themselves set high standards for their operations. Consultation should occur on the final site plan with all stakeholders, including local groups. Increasingly, the future social and economic conditions of the local community are also becoming important determinants.

For new sites the issue of closure should already be addressed in the planning stage of the mine, and assessed through the Environmental Impact Assessment (EIA) where one is required. Progressive rehabilitation, long-term monitoring and aftercare are now increasingly included in site permits. Actual site closure is the responsibility of the owner/operator of the site. Governments commonly require some form of financial guarantee to ensure that resources are available in case of premature closure of the site.

Rehabilitation of old sites where mine activity is still ongoing is generally regarded as the responsibility of the current owner, although for some sites the rehabilitation costs may be beyond the person's or firm's financial resources. Under such circumstances, the state may assume part or all of the liability if it is in a position to do so.

The greatest uncertainty surrounds abandoned (or "orphan") mines where no owner can be identified. These are usually left to the responsible authorities to manage; however, in most countries the authorities have no significant funds to undertake rehabilitation. Financing of rehabilitation by way of a general levy on present operators has been rejected as an option by industry on the ground that it unjustly penalizes responsible companies. It is urgent that a more innovative approach be found in which all of the social partners take some commitment to action, including financial commitment.

The question of liabilities has to be resolved in one way or another before the privatization process can be fully implemented. In the past, states have sometimes assumed part of the total liability in order to speed up the privatization process; however, few states are in a position to finance the rehabilitation from their normal funding sources, and the assumption of such responsibility by a state does not necessarily mean that it can be carried out.

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Environmental Management in Industry

How does the mining industry manage its environmental responsibilities? What potential exists for further improvement in environmental management? What are the factors that determine good corporate environmental performance? How do environmental management systems (EMS) influence industry performance? To what extent can EMS be applied in small and medium-scale operations?

Sustainable development requires industry to employ systems for the effective and efficient attainment of environmental objectives, just as it does for economic objectives. An environmental management system is defined as follows:

"It is the systems or mechanisms that a firm has in place at each of its facilities to ensure compliance with corporate policies and environmental regulations. This system can be written or verbal."

Various systems attempt to codify approaches to environmental management, including the initiatives of the International Standards Association. Elements that such systems have in common are the adoption of an environmental policy and the setting of targets for continuous improvement by each corporation. Where they differ is in the requirements for audit and the certification of the process by independent third parties.

An important feature driving the process is the growing need to provide a public account. Whatever environmental management system may be adopted will depend on regulation and corporate culture. Such systems are essential as an integrated part of a company's economic goals. They are seen as a vital part of the efforts toward continuous improvement of performance.

The environmental reputation of an entire industry depends on the performance of its weakest member. The establishment of industry-wide codes of conduct by mining industry organizations can enhance both performance and credibility.

Striking parallels are evident between successful safety programs and successful environmental management systems. Both are preventive in orientation. Both stress important elements of quality management and depend critically on employee attitudes and motivation. The adaptation of one such successful safety management system as a basis for environmental hazard assessment and effects management involves a pragmatic approach to compliance with regulatory and policy requirements. Application of an appropriate management process, instead of prescriptive environmental standards, yields continuous environmental improvement while respecting different social values and local conditions.

In many countries, serious environmental damage is associated with small-scale mining. However, the difficulty of applying environmental management systems to the informal sector is recognized. A tendency to illegality in this sector of the industry erects special barriers to environmental progress. Monitoring and auditing should be followed up by education and training and a regulatory structure should be developed that provides incentives for improvement. The energies of environmental non-governmental organizations (NGOs) need to be harnessed. Considerable mutual benefit could result if technical assistance could be obtained from larger mining enterprises operating in the same area.

The justification for environmental management systems, wherever they may be applied, is that the prevention of harm must be outweigh the costs and liabilities for clean-up associated with potential damage. Principles of environmental management are being adopted and the mining and metallurgical industries are making rapid progress in this field. These systems are part of the industry's efforts to demonstrate that mining is compatible with environmental protection.

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World Bank

The World Bank is a multilateral lending agency, created in 1944 and owned by 177 governments, with the goal of promoting long term economic development. The World Bank consists of four closely associated institutions: the International Bank for Reconstruction and Development (established in 1947), the International Development Association (1960), the International Finance Corporation (1956), and the Multilateral Guarantee Agency (1988).

The World Bank's sponsorship of the conference was provided through the Industry and Energy Department of the Vice Presidency for Finance and Private Sector Development.

United Nations Environment Programme - UNEP

UNEP — the United Nations' environmental conscience — coordinates U.N. activities in the field of the environment and ensures the cooperation and participation of governments and the international scientific and professional communities, and non-governmental organizations. UNEP was established in 1972 to report on changes in the world environment, to track the underlying causes of this change, and to work with governments to develop appropriate responses. In developing such responses, UNEP works with other U.N. agencies to ensure an effective system-wide action, as well as developing partnerships with industry and other community organizations.

UNEP's sponsorship of this conference was coordinated by its Industry and Environment Centre located in Paris, France.

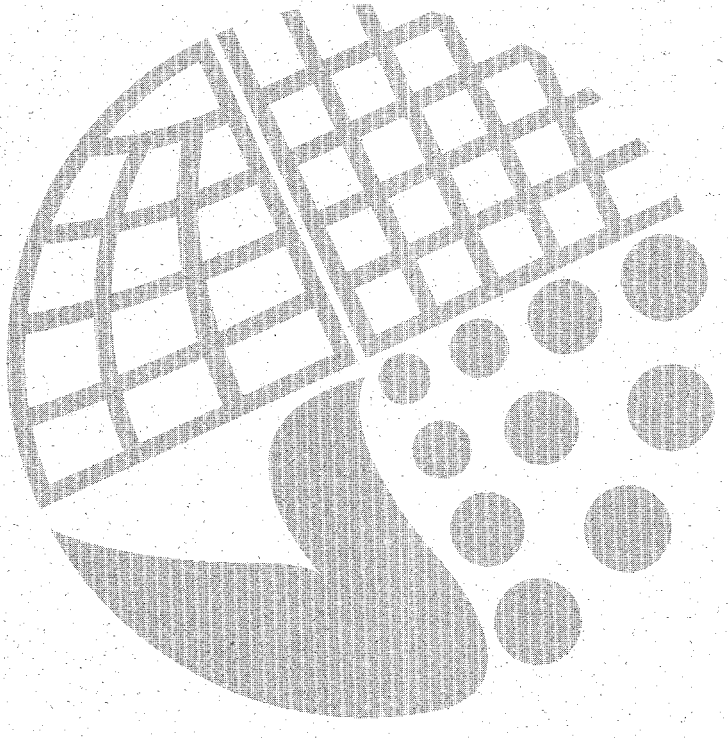
United Nations Conference on Trade and Development - UNCTAD

UNCTAD was established in 1964 as an intergovernmental forum for the deliberation and negotiation of international trade and development issues. Now comprising 187 member countries, it aims to accelerate the economic development of developing countries through policy analysis, the promotion of international legal instruments and technical assistance. Within the United Nations, UNCTAD is entrusted, *inter alia*, with the responsibility for global mineral issues.

UNCTAD's sponsorship of this conference was provided by the Minerals and Metals Branch of the Commodities Division.

The International Council on Metals and the Environment - ICME

Founded in 1991, the ICME is a non-governmental organization that promotes the development and implementation of sound environmental and health policies and practices to ensure the safe production, use, recycling and disposal of metals. The ICME emphasizes the importance of sound science and technical and economic analyses underlying policies in support of environmentally sustainable economic development. Its membership currently includes 25 companies from 16 countries, bringing together the world's major non-ferrous and precious metal mining and producing companies.



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