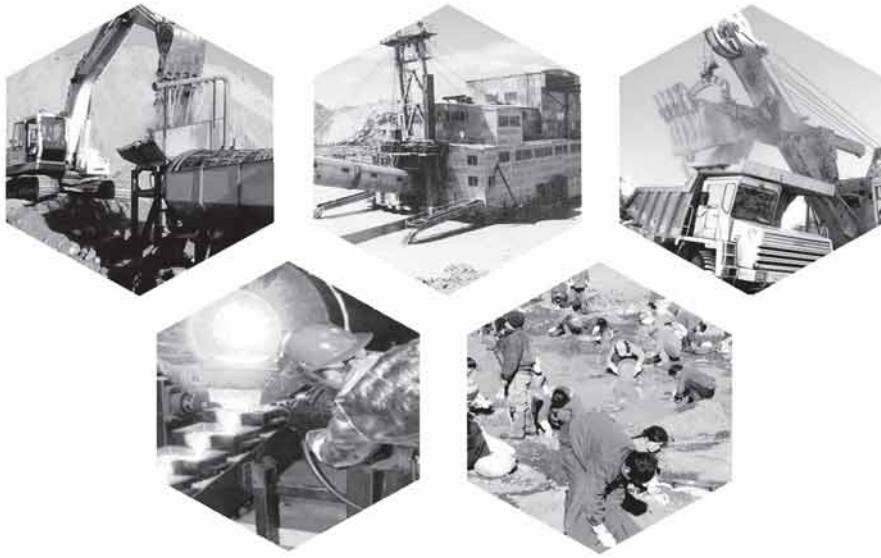




**МОНГОЛ УЛСЫН УУЛ
УУРХАЙН САЛБАР:
Ирээдүй Таны Гарт**

**MONGOLIA MINING SECTOR:
Managing The Future**



MONGOLIA MINING SECTOR: Managing The Future

Currency Equivalents

1 US Dollar equals 1130 Tugrugs (MNT)

Weights and Measures

Metric System

Fiscal Year

January 1 – December 31

Abbreviations and Acronyms

ADB	Asian Development Bank
Au	Gold
Cu	Copper
EEOITL	Economic Entity and Organization Income Tax Law
GDNT	General Department of National Taxation
GDP	Gross Domestic Product
GIC	Geological Information Center
GMIA	Geological and Mining Inspection Agency
ILO	International Labor Organization
IRR	Internal Rate of Return
MGS	Mongolian Geological Survey
MIT	Ministry of Industry and Trade
MMSD	The Mining, Minerals and Sustainable Development project
MNE	Ministry of Nature and Environment
MNA	Mongolia Mining Association
Mo	Molybdenum
MoFE	Ministry of Finance and Economy
MRAM	Mineral Resources Authority of Mongolia
MW	Mega Watt
SE-EW	Solvent Extraction Electro Winning
SME	Small and Medium Enterprises
SOE	State Owned Enterprise
OGMC	Office of Geological and Mining Cadastre
Oz	Troy ounce
PHI	Public Health Institute
PRSC	Poverty Reduction Strategy Credit
PRSP	Poverty Reduction Strategy Paper
PSMFA	Public Sector Management and Finance Act
PTRC	Population and Teaching Research Center
t	Metric ton
UNDP	United Nations Development Program
VAT	Value Added Tax
Zn	Zinc

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EXECUTIVE SUMMARY

INTRODUCTION

1. This study is based on field work undertaken in the Spring of 2003 and builds on previous projects undertaken by the World Bank in Mongolia¹. It assesses the medium-term growth potential of Mongolia's non-fuel minerals industry and its potential contribution to economic growth, poverty reduction, and regional development. The study evaluates the current state of the mining sector to identify favorable factors for development and potential constraints, review investor perceptions and international case studies of best practice on how to address these constraints, and recommends options for government actions to improve industry management and the investment climate.

2. Its main objectives are to:

- Assess the medium-term growth potential of Mongolia's non-fuel minerals industry and SME supply chain linkages, and their contribution to gross domestic product, economic targets, and regional development;
- Diagnose the state of the Mongolian mining sector and identify problems, constraints and bottlenecks to new investment, growth and increased contribution of mining to the national and regional economy;
- Provide international comparisons and examples of best practices as to how other countries have addressed the issues, problems and constraints that are identified; and
- Formulate possible options and alternatives that may be considered by the government to improve efficiency, competitiveness, sector management, and the investment climate.

THE MINING SECTOR

3. Mongolia is a landlocked country in the heart of the Asian continent. It has a population of 2.5 million and vast tracts of desert, semi-desert and mountainous terrain. Agriculture and mining are the dominant economic activities. In 2002 gross domestic product was US\$1 billion. The mining sector is a major contributor to the economy, accounting for about 9 percent of GDP, 49 percent of industrial output, and 40 percent of export earnings. The economy grew at only about 1 percent in 2001, with growth in mining offset by a decline in agriculture. The formal mining industry sector employs over 12,000 people and the informal (artisanal) mining sector may involve more than twice this number.

4. Mongolia's geology is complex and its mineral potential vast; over 6,000 mineral showings/deposits of 80 different minerals are known. The most economically significant of these are base metals, gold, and fluorite. Although gold production increased on an average annual basis over 1997-2002, there was a decrease in production in 2001-02. The mining industry's historic output is largely based on copper and gold. Mongolia has only one copper mine (Erdenet), which earns about half of all foreign exchange and provides almost 25 percent of government revenues. Erdenet

¹Previous bank operations in Mongolia include, stabilizing operations at Erdenet Copper, rehabilitating Baganuur Coal Mine, reforming the legal/regulatory framework, and various initiatives to promote investment in the mining sector. Issues related to the environment are not dealt with in this survey and reference is made to work undertaken by the World Bank Group in 2003, specifically the draft 'Review of the Environmental and Social Policies Practices for Mining in Mongolia' (World Bank) and the Mining and Petroleum Sector Profile prepared for the Mongolia Investors' Forum (IFC).

production has been declining and will deteriorate even further as the head grade decreases in copper/molybdenum with depth, and world as commodity prices maintain their decline. Gold production comes primarily from placer operations (shallow alluvial concentrations of gold). These are smaller mines showing progressive depletion of mineral reserves. Without active exploration for new placer deposits, this declining trend is likely to continue.

5. In addition to production constraints, the mining sector has faced a volatile international price situation. Although copper production has increased steadily since 1997, the world copper price has decreased, and the value of Mongolia's copper exports fell from over 27 percent of GDP in 1995 to 14 percent in 2001. Gold production also increased steadily until 2001, but with weakened prices. Then in 2002, when the gold price increased, production decreased by 11 percent from the 2001 level.

6. There has been a rapid rise in mineral exploration in Mongolia. This is in part due to the 1997 Minerals Law, which has played a pivotal role in attracting foreign exploration companies. Other important factors were the government's abolition of a 10 percent gold tax, and the widely publicized discovery of the Oyu Tolgoi copper/gold deposit in 2001. Since this discovery, the number of exploration licenses held and the amount of land held by licensees has increased fivefold. There are now 2,595 exploration licenses in Mongolia covering 40 million hectares, 26 percent of its territory. The government's Office of Geology is the largest landholder.

7. Non-governmental holdings are concentrated in seven companies that control 50 percent of the remaining license areas. The four largest of these companies are foreign. Exploration expenditure for 2002 is provisionally estimated at US\$18 million, triple 2000 expenditure of US\$6 million. This dramatic increase in expenditure was the largest in the world. The increase in exploration activity has led to a number of discoveries.

8. Mongolia has a number of mines under development. Hard rock gold mines at Borro, Bumbat and Olon Ovoot are due to become fully operational in 2004 and the zinc mine at Tumurtiin is scheduled to begin production in 2005. These new mines are not expected to have a significant impact on production in the short term but are important to the sector and the economy for the long term.

ARTISANAL MINING

9. Artisanal mining in Mongolia is not a longstanding traditional activity but primarily a response to the adverse effects of economic restructuring, which has resulted in job losses, inflation, and declining real incomes. People have had to find their own solutions to these problems, most often outside the formal economy. Artisanal mining is a viable solution for many because it is a highly labor intensive, technologically simple, and low-cost activity. Its growth, and sales on the informal market, has become important to Mongolia in both economic and political terms.

10. Much artisanal mining has emerged around reclamation of gold-bearing tailings discarded by inefficient commercial placer mines. The surge in commercial development of Mongolia's extensive placer deposits in the early 1990s left large amounts of waste material that provided a relatively rich and readily accessible resource base for artisanal miners that can be tapped with simple, affordable tools; the recovered gold is easily marketable.

11. Artisanal gold mining started as a seasonal activity involving hundreds of people; in the past six years it has escalated into a year-round livelihood involving an estimated 30,000 people. This activity poses a significant development challenge for Mongolia. While it has provided significant economic opportunities for poor Mongolians during difficult economic times, commercial miners and local government authorities have been critical, asserting that it is outside the legal

and regulatory framework, and risky, degrades the environment, and exposes miners to hazardous work conditions and toxic chemicals.

12. Because artisanal miners in Mongolia have no rights or claims to land or minerals, conflicts have emerged between informal miners and licensed commercial mining operations, usually when there has been direct competition for access to mineral resources. Local authorities have tried to reduce conflict by negotiating arrangements with the commercial mining companies to allow artisanal mining, but many companies prefer to rely on security forces to defend their interests. Conflicts between local authorities and informal miners have thus far been minimal, although local authorities have also used police to evict miners. The informal miners have not resisted eviction and harassment but are upset and pushing for a resolution to normalize their situation.

13. Artisanal mining has become part of Mongolia's informal social safety net. At minimal cost to the state, it has created economic opportunities in mining and other areas of the informal sector developed to serve the needs of artisanal miners. Formal or licensed mines are usually enclaves that spin off most of their economic benefits to larger suppliers in urban areas. However, commercial miners have complained that artisanal activities interfere with their operations. Local authorities are concerned with the potential public sector burden of environmental and health hazards. International experience demonstrates that the political price and the social and economic costs of trying to eliminate artisanal mining would be high. Yet to leave the situation unchecked presents social, environmental, and political risks that most governments would find difficult to accept.

14. In 2001 the government attempted to accommodate artisanal mining by enacting an interim regulation of this informal activity. That regulation proved ineffective and unworkable; it lapsed after one year and was not renewed. The government is now proposing to create a legal framework for artisanal mining and is drafting a new law.

MONGOLIA'S MINERAL TAXATION SYSTEM

15. Mongolia's mining tax system includes corporate taxes, personal income taxes, mineral royalties, value-added taxes, customs and excise duties, social insurance, and stability arrangements. The 1997 Minerals Law requires the Ministry of Finance to implement regulations to govern the income of mining enterprises, including amortization of exploration and development expenditures, depreciation of fixed assets, a three-year loss carry forward provision, and rules relating to the deduction of infrastructure costs. These regulations have not been implemented and could have significant impact on investment decisions and mineral sector development.

16. The purchase of imported goods is subject to a 15 percent VAT. While mining companies that export their production can receive refunds of taxes paid on imports of production equipment, the government has proposed amending the VAT law to exclude non-producing companies. This would effectively deny VAT refunds to companies during the exploration and development phases, increasing the cost of doing business in Mongolia. It is uncertain whether VAT paid during these phases of mine life would be recoverable once production started. Under the VAT laws of other countries, VAT paid prior to registration is not refundable. Furthermore, since the sale of gold was exempted from taxation in 2002, gold producers in Mongolia are not entitled to VAT refunds. This policy places Mongolian gold producers at a competitive disadvantage compared to other Asian countries, where gold sales are taxed and producers typically receive VAT refunds.

17. Holders of mining licenses and the government can enter into stability agreements that set tax rates for a defined period of time, establish a licensee's right to export and sell its products in international markets, or guarantee that licensees may receive and dispose of hard

currency derived from sales. Such agreements run ten years for investments greater than US\$2 million, and 15 years for investments over US\$20 million. Three mining companies have entered into stability agreements.

REFORMING THE LEGAL AND REGULATORY FRAMEWORK

18. In the past decade the government has evolved from being predominantly the owner/operator of mines to being a manager/regulator. During the past 18 months, the Mongolian mineral sector has received significant foreign direct investment attention and corresponding national private sector expansion. The sector has established a prominent international profile as a result of its reform initiatives, geological prospectivity, and media exposure of its potential world-class copper and gold deposits in the south Gobi area. The stability of the overall legal/regulatory framework is important for future sector expansion.

19. The 1997 Minerals Law is still very young legislation. It represents international best practice and was designed to accommodate government's limited institutional capacity by providing a simple but robust framework supported by appropriate regulations. Clarifying regulations have, however, not yet been developed for many license holder obligations.

GOVERNMENT POLICIES TO IMPROVE SECTOR PERFORMANCE

20. The government is committed to improving mining sector performance, and has issued policy guidelines outlining mineral development and sector promotional goals for 2002–10. A key element in these guidelines is a commitment to reinforce the already favorable legal environment for private mineral exploration activities. The guidelines also recognize the transition away from state ownership and control.

21. The government's new guidelines focus on a market-driven, private-sector-oriented industry that is regulated by the government. However, the government has chosen not to privatize its interest in the two largest mining companies, Erdenet and Mongolrostsvetment, because of their importance to the economy, but is seeking technical alliances to improve competitiveness.

22. While placer gold operators are beginning to resume exploration to increase reserves, international investors are focusing on identifying and exploiting hard-rock deposits, and future growth potential in the mining sector lies in such deposits. There is also an ongoing assessment of significant exploration prospects, which could lead to substantial increases in output in the medium to long term. These prospects include Oyu Tolgoi (copper/gold), Gatsuurt (gold), and Golden Hills (gold).

KEY STUDY FINDINGS AFFECTING FUTURE PERFORMANCE OF THE MINING SECTOR

23. Mining activities can provide considerable revenue for the government through taxes and royalties. Most mines in Mongolia are likely to be small to medium in size and geographically diverse. They could very well create significant domestic demand for smaller suppliers of good and services. In addition, the large informal mining sector and related services could transform themselves into viable SMEs. With expected moderate growth in mining over the next ten years, there is a significant potential to develop SMEs to provide basic goods and services related to mining expansion.

24. The acquisition of land is often a prerequisite for increasing mining production. For local populations making a living from traditional agriculture, monetary compensation is often not a

viable solution. The most advanced compensation agreements being used globally for displaced landowners combine mine employment with the creation of spin-off businesses relating to mining activities, and some training/capacity building. Such an approach effectively compensates landowners by helping them acquire the capabilities to use financial resources as alternative assets to land.

25. Globally, mining companies have also responded to the need to support social programs that benefit the surrounding communities by developing foundations that are capable of leveraging funds for community development and social programs from other sources such as private donors and public funds.

ESTABLISHING ADEQUATE INFRASTRUCTURE TO MEET MINING SECTOR GROWTH

26. A mining prospect's proximity to road, railway, and power infrastructure has a major impact on the capital costs of development. Geological prospects that would normally be viable become uneconomic if the costs of providing the necessary infrastructure are too high. Mongolia needs to give serious consideration on how best to develop infrastructure over the next ten years, as the location of new roads, railways and power plants will have major impact on mining development. Almost all medium and large mine developments likely to occur in Mongolia will require significant new power, water, and transportation infrastructure.

27. Mongolia's largest prospect, Oyu Tolgoi, is located in one of the most remote parts of the country and has no water, power, or transportation within more than 300 kms. While it is possible to find water through drilling in the vicinity, a road or railway needs to be built to the site to connect with China, which would be a major market for the project. It will also be necessary build a power plant or provide high-voltage transmission lines from either the Mongolian or Chinese national grid. The prospect's operators are examining the possibility of building a railway line from China to the deposit site financed by a range of possible options including using state funding. However, it is certain that the cost of providing the necessary infrastructure will dramatically increase the capital cost of developing this prospect and may end up delaying its commissioning. The Tumurtiin zinc mine also is far from a railway line.

POTENTIAL INSTITUTIONAL AND POLICY CONSTRAINTS TO MINING DEVELOPMENT

28. Foreign investors will be the key driving force developing mining in the medium to long term and a key element in the mining study was a survey of perceptions of the largest mining sector investors. The survey was based on a questionnaire asking their overall views of the current investment climate, constraints to development, and problems. The questionnaire also asked for recommendations on how to improve the investment climate for mining.

29. The survey indicates that investors generally view Mongolia as a favorable location for mining investment. Most respondents had a high regard for Mongolia's mineral potential and felt the government was responsive and reasonably investor friendly. The Mineral Resources Authority of Mongolia (MRAM) had a high rating and compared favorably with similar organizations in Asia. Investors found the mining and exploration licensing system in Mongolia reasonably effective. Most of the 15 respondents considered the Minerals Law internationally competitive.

30. While most investors found the overall legal and regulatory framework favorable, they were concerned about the stability of the system and government^{3/4}particularly local government^{3/4}corruption. They also found implementation of the laws to be less than satisfactory, and expressed serious concerns over the government's intentions and repeated attempts to amend laws without stakeholder consultations. While the respondents generally considered

reporting requirements for mining and exploration activities reasonable, most felt unsure about confidentiality when reporting to the government. Investors would like to see an improvement on the collection and dissemination of geological data and believed the government could be more effective in promoting Mongolia's mineral potential internationally.

31. Respondents found levels of taxation not competitive compared to other countries in Asia. They considered Mongolia's tax legislation complex and difficult to comprehend. In addition, all respondents felt the Mongolian authorities did not understand international best practices in mining taxation, and that the implementation of legislation often appeared to contradict other laws. Stability agreements were widely regarded as very important in doing business in Mongolia. It will also be important to ensure that improvements in environment law and enforcement are implemented in line with recommendations of the review sponsored by the World Bank.

32. very important, 5 = irrelevant)

Investors pointed to a number of specific areas in the business environment that they would like the government to address. These included the implementation of enabling regulations to avoid the unnecessary amendments to the Minerals Law proposed by government in 2003 and uncertainty in the legal and regulatory environment. They are also concerned about the Office of Geology's direct holding of exploration licenses and a lack of consistency in the implementation of legislation, particularly taxation regulations, and also a lack of transparency within the MRAM Cadastre Office.

KEY ISSUES IN MANAGING THE MINING SECTOR

33. Mongolia's mining sector has the potential to contribute significantly to economic growth but its development will to a large extent depend on the government's capability in managing its mineral wealth and ensuring sound governance for the sector. The government should try to address the challenges associated with countries that depend on mining for growth, namely, preventing the development of unsustainable fiscal policy and mounting debt; avoiding rent-seeking behavior, and overcoming absorptive capacity constraints and adverse impacts on non-mineral exports.

34. With regard to the latter, a significant increase in mineral production might also have an impact on growth by adversely affecting the competitiveness of the non-minerals export industry, notably manufacturing. It is possible that due to mining output expansion, input factors, especially labor, will generally move toward the mining industry seeking higher wages. This could lead to a slowdown in manufacturing growth, which could inhibit overall economic growth as manufacturing usually has greater dynamic externalities than the mining industry.

PROJECTED MEDIUM-TERM IMPACT OF THE MINING SECTOR ON THE ECONOMY

35. This study undertakes a series of projections for each of the 27 mining operations and proposed projects in the sector. These were based on the commodity price distributions, cash flow probabilities and correlation between the two. The study consolidates these to provide expected aggregate results for the sector. Under reasonable assumptions the expected growth in mineral output in the medium term is encouraging, with a mean annual increase of 22 percent in zinc production, 7.5 percent in gold production and 3.4 percent in copper production.

36. The mining sector's contribution to GDP is projected to double from US\$96.7 million to US\$189.7 million between 2002 and 2008. Its contribution to GDP will remain at about 10 percent over this period. Mongolia will continue to rely on the mining sector for growth and simulations

indicate expected growth in the mining component of GDP of 12 percent per annum for the base case scenario over the next 5 years. A more optimistic scenario, which assumes higher commodity prices, shows yearly growth of 27 percent, while a pessimistic scenario, with lower commodity prices, shows a decline of 3 percent. The mining sector is poised to make a robust economic contribution and support the government's average annual GDP forecast of 6 percent annually by 2004 and 10 percent annually by 2010.

37. Between 2002 and 2008 copper exports are projected to almost triple - growing from US\$136.9 million in 2002 to US \$ 412.2 million (20 percent of GDP) in 2008. The share of copper in total exports is projected to increase from 27 percent to 45 percent over the same period. These significant increases in export revenue would reverse fully reverse the current account trends from a deficit of 9.6 percent of GDP in 2002 to a surplus of over 2.8 percent of GDP. In the short term however proceeds from copper exports are projected to drop from about US\$ 13million to US\$ 45 million between 2003 and 2006, widening the current account balance deficits 10.3 percent in 2003, to 11.4 percent in 2004. Gains in increase copper production are conditional on price fluctuations that terms of trade remain stable and the government maintains flexible exchange rate policy.

38. On the fiscal side, total contribution of copper to overall revenue will grow by about 10.4 percent annually between 2002 and 2008, from Tg 24.5 billion to Tg 49.3 (revenue from corporate tax at 9.0 percent and royalty at 13.1 percent). Despite the attractive tax holidays the government is offering investors and a decline in the proportionate contribution of the income tax component, the fiscal projections remain encouraging, however the government will need to guard against even further tax holidays, as this will compromise its ability to effectively re-distribute the benefits of increased copper revenues to the population.

RECOMMENDATIONS

39. To realize mining sector growth potential the government should maintain the stability of the legal and fiscal framework and its commitment to private sector development of the minerals sector. It should respond to the key concerns expressed in the study's survey of private sector investors, in particular putting in place the enabling regulations for the minerals law and improving the mining fiscal regime as outlined below. The government should continue to improve its awareness of best practices in the international mining sector and address three categories of recommendations in the management of mining revenues. This is necessary to avoid the policy errors of other mineral dependent countries, and ensure that the mining sector becomes an engine of growth for Mongolia and include macroeconomic policies; policies for institutional building and strengthening; and regional and local development policies. Finally, the government should carefully formulate policies and regulations for the artisanal mining sector.

ACTIONS TO ADDRESS THE KEY CONCERNS OF THE MAJOR INVESTORS SUPPORTING SECTOR GROWTH

40. Provide the enabling regulations for the otherwise acceptable overall legal and regulatory framework. A key element in achieving planned mining sector growth will be maintaining the legislative and institutional stability that has spurred investment in Mongolia's mineral sector in the past few years. Overall, investors are satisfied with the legal and regulatory framework. However, the investor survey shows that improvements are required in terms of putting in place the enabling regulations for the law. Stability can be strengthened in the short term by drafting regulations for implementing the Minerals Law and enacting a special artisanal mining law to integrate this socially important activity into the current large-scale mining framework. In particular,

the regulations should provide for comprehensive rules and procedures for, and stronger government management and inspection of private-sector mining activities.

41. *Improve the tax system to enhance investor confidence.* Based on a review of Mongolia's tax system as it applies to the mining sector, and on experience of international best practice, the study makes the following recommendations in response to the concerns of key investors in the mining sector:

42. *Move away from tax holidays.* The global trend in tax policy is away from tax holidays. A progressive reduction in the tax-exempt periods is warranted and should be offset by a reduction in income tax rates to more competitive levels, and the implementation of accelerated depreciation provisions.

43. *Reduce the royalty applicable to placer mining:* The current rate of 7.5 percent is not internationally competitive. Mongolia's mineral tax regime would be improved if this royalty rate were reduced to 2.5 percent, using the same rate for all other mineral production.

44. *Repeal the exemption of gold sales from VAT:* Due to this exemption, gold producers are not entitled to VAT refunds and must therefore bear an extra tax burden in purchasing goods and services for their mining operations. Consequently, gold producer capital costs and operating expenses can be up to 15 percent higher than if they were operating in competing countries. The current exemption is contrary to standard international norms and should be zero rated for tax purposes.

45. *Ensure more equitable distribution of tax revenues.* All taxes are now paid to the central government. It is important that local communities affected by mining operations see that they benefit directly from such operations. A preferred way to achieve this is to have at least a portion of mineral royalties paid directly to local governments.

46. *Refrain from amending the law to permit only companies producing minerals to register for VAT purposes:* Such an amendment would mean that companies in the exploration and development phases would not be entitled to VAT refunds. This would increase the cost of exploring and mining in Mongolia, and present a barrier to investment. Such a VAT provision also would not be consistent with international best practices.

47. *Ensure that stability agreements are fair and encourage private investment:* The government must be mindful that, based on the experience of other countries, stability agreements can be counterproductive if they are not handled in a transparent and consistent manner, and in accordance with clear guidelines.

48. *Maintain relevant statistical information about the taxes paid by the mining sector and sub-sectors:* At present, statistical information concerning tax collections from the mining sector is difficult to obtain and is unreliable.

49. *Improve investor confidence in the administration of the tax system:* There are several improvements that could boost this confidence. First the corporate income tax law should include a loss carryover provision consistent with international best practice. Second, this law should prescribe the tax treatment of exploration and development expenditures. These expenditures can be substantial, but the current law does not address their tax deductibility. Third, the tax treatment of mine reclamation and closure costs should be addressed in the corporate income tax law. Fourth, the corporate income tax law should confirm the deductibility of mineral royalties in determining taxable income.

50. *Improve the management of artisanal mining, taking into account its rapid expansion, and its economic, political, and social importance.* The study's recommendations for the artisanal

mining sector cover the need for more information to develop an appropriate legal and regulatory framework as well as specific actions to address child labor, environmental and health concerns:

51. *Defer the approval of the proposed law pending a comprehensive review of the artisanal mining sector:* This review should include additional data collection, formulation of an action plan, and establishment of broad-based consultation with key stakeholders.

52. *Conduct a comprehensive gathering of information on the artisanal mining sector:* Current information about the social /economic organization and dynamics of artisanal activity is limited. The development of a legal framework requires a much better understanding of current organizational patterns of work in relation to the types of production systems in use.

53. *Formulate an action plan:* Based on the results of the above information-gathering activity, the government should adopt a staged approach to change and development of this sub-sector. This approach should include pilot projects designed to identify and test viable organizational forms and patterns to optimize social and economic value under different circumstances

54. *Establish broad-based consultation with key stakeholders:* The design of new policies and approaches should be inclusive, involving those who are directly impacted by its design, evaluation, and implementation. It should be based on a vision that reflects both immediate needs for better field organization and safer practices and longer-term possibilities for strengthening its contribution to the development of more sustainable communities and rural economies.

55. *Enhance environmental protection and rehabilitation.* In the absence of defined legal responsibilities for environmental management, commercial miners on whose properties the informal miners currently work, should be encouraged to provide some basic technical assistance to ensure the use of more benign mining practices, site remediation and environmental management. Especially since the ultimate legal responsibility for site remediation still lies with the commercial miners. The new mining law related to artisanal mining should include appropriate and enforceable procedures and regulations relating to environmental management and more responsible mining practices.

56. *Progressively eliminate child labor from the mines:* Initially this program should emphasize the removal of the youngest children who are the most vulnerable to the adverse effects of handling mercury and other hazardous aspects of artisanal mining.

57. *Design an educational program for the safe handling of mercury, which is used extensively in artisanal gold mining:* The government should establish an educational program and a related demonstration project to introduce changes in the handling of mercury. Simple measures may dramatically reduce the exposure hazard, e.g. use of retorts or closed ovens vented to the outside of the dwelling or work area.

58. *Strengthen the Mine Rescue Service in implementing its mandate and focus on artisanal mining:* This service could become the key institutional lever for improving health and safety in the field. Given its legal mandate and current focus on artisanal mining, the rescue service should be better funded to enable it to intervene more effectively with artisanal miners on hazard awareness, mine safety, accident prevention, first aid and mine rescue training. This task is all the more timely insofar as most of the gold miners have no experience or training in mining and many of the summer migrants to the mines are newcomers.

59. *Conduct an institutional needs assessment across agencies at the central and local levels:* This assessment should identify resources and capabilities for the design and implementation of policies, laws and regulations relating to artisanal mining; and recommend measures for ameliorating deficiencies.

60. *Establish sound policies to avert potential mismanagement of revenues from the expanding mining sector.* An appropriate policy response to the economic shocks associated with development of a country's mineral endowment is key to avoiding mismanagement of fiscal revenues and the potential adverse impacts on growth in the medium term. Although minerals have the potential to contribute significantly to growth, it is the government and its macroeconomic, institutional and local development policies for properly managing mineral wealth that will ultimately determine whether this potential is realized

61. *Macroeconomic policies.* The main thrust of macroeconomic management should be to prevent a spending spree by the public sector in response to a significant expansion of mining revenues due to an increase in metal prices or a large increase in mining production. To this end, allowing the public and financial sectors to invest in foreign financial assets should offset the economy's absorptive constraints. This is not to say that the financial sector should be fully liberalized, but that some degree of financial freedom can be allowed without compromising the economy's foreign reserves and stability of its capital account. This policy would moderate broad fluctuations in the balance of payments and wide swings in private expenditures.

62. *Institutional strengthening policies.* To use mining revenues efficiently and effectively it is important to overcome problems in the relationship between the central and regional governments. In particular, this would involve clarifying the mandates and jurisdictions of agencies at different levels of government. Moreover, it is important to strengthen local governments by allowing them a significant source of revenue over which they have autonomy and by building their capacity to use it well. Within this framework, which is compatible with the decentralization of mining revenues, the government could explore the possibility of allocating mining royalties directly to provincial authorities, a policy that has worked well in Bolivia, providing capabilities are in place to use the funds soundly. The government also should consider: enhancing institutions involved in conflict management; improving the transparency and accountability of government management of mining revenues, and preventing rent-seeking behavior and corruption.

63. *Regional and local development policies.* The government should give attention to developing a comprehensive framework for compensation and benefit sharing in managing mining revenues for local community development. Such a framework should establish the regulations for community compensation and for a process that will lead to community development plans, including community consultation. At the same time, it should clarify the rights and responsibilities of the central and regional administrations, and mining companies. Benefit sharing also should include improvement in education and health and as the collective ability of communities to organize themselves, define their priorities, and negotiate their interests effectively with third parties. If the government assumes the challenge of promoting an advanced comprehensive framework for local compensation, it will be among the pioneers in the world in dealing with this critical issue of mining development.



OVERVIEW OF MONGOLIA'S MINING SECTOR

CHAPTER 1

1.1 The minerals industry has evolved into a truly global industry that is highly competitive, generally capital intensive, technologically complex, and risky. With few exceptions its development is dependent on and shaped by competitive global commodity markets, geological mineral endowment, and national legal, regulatory, and fiscal conditions. The industry is increasingly influenced by a limited number of well-financed, technologically advanced international mining companies. These companies are highly selective, risk averse, and sensitive to changes in the investment climate. A 1991 UN/World Bank survey identified six factors used by these companies to evaluate mineral projects and potential investments:

- Geological prospectivity and mining tradition,
- Clear mining rights and title (legal/regulatory framework),
- Attractive and competitive fiscal conditions (fiscal legislation),
- Ownership and control of operations (legal/regulatory framework),
- Political stability and transparency of governance (institutional capacity),
- Availability of infrastructure.

Box 1.1 Mining Reform in Argentina

Argentina's new government announced an ambitious program of macroeconomic and sectoral reforms in 1991. A major effort was undertaken to reduce the presence of the state in the economy, the currency was fixed to the US dollar to stop inflation, and impediments to new investment were remedied. In the mining sector, which had been moribund for years despite highly prospective geology, reforms included opening ground held by federal and provincial government corporations to new private investment, rewriting the mining law, passing a new mining investment act with internationally competitive fiscal incentives, introducing a modern computerized mine title and registry system, upgrading geological information systems to international standards. The results have been very successful: since 1993 Argentina mineral production has increased from US\$341 million to US\$1,310 million; annual exploration expenditures are over US\$150 million and capital expenditures US\$350 million. Mineral exports of minerals have risen tenfold from US\$78 million to US\$ 700 million, and, minerals exports are greater by value than beef.

1.2 Given the capital sums required, low probability of success, and volatile markets, governments increasingly have abandoned direct involvement in mining. Recognizing the potential of private investment, many emerging economy governments have embarked on mining sector reforms that restrict the role of the state to sector management and regulation. They have adopted legal/regulatory frameworks that provide equal access to mineral rights, security of tenure, and the freedom to exploit, market, and assign minerals. They have established globally competitive fiscal regimes, and created institutional structures that seek to ensure stability, good governance, and regulatory consistency. They generate and provide, as a public good, basic geological data to encourage interest in mining. Appropriate mining reforms, consistently applied, have attracted significant local and foreign direct investments, produced sustained growth in industrial output, export earnings and GDP, and resulted in meaningful indirect benefits in local community development, formation of SMEs, and job creation.

1.3 Mongolia, with its good geology and undoubted mineral endowment, stands to benefit by continuing to reform its mineral sector, improving its fiscal competitiveness, and encouraging private exploration and development of its vast land mass.

Table 1.1: Impact of Mineral Sector Reforms

Level of Exploration			Industrial Output		Exports	
(US\$ million)						
	Before Reforms	After Reforms	Before Reforms	After Reforms	Before Reforms	After Reforms
Argentina	<3	150	340	1,310	70	700
Chile	15	250	2,400	7,500	2,300	6,900
Peru	10	200	2,000	3,900	1,900	3,600
Tanzania	<1	35	53	350	53	350
Ghana	<1	n.a.	125	700	125	650
Mali	<1	30	<1	242	<1	230

Source: Bank Staff estimates

GEOLOGICAL SETTING AND MINERAL POTENTIAL

1.4 Mongolia's geology is complex and its mineral potential vast. Mongolia occupies the interior portion of the Eurasian Plate, a series of accreted terranes and micro plates that decrease in age to the south. The Tuva Terrane, in the north, is made up of Proterozoic and Lower Palaeozoic rocks, while the Southern Block contains an important component of Permian to Jurassic intrusive. A major Caledonide (Variscan) deformation cratonized northern Mongolia, while a Hercynian event deformed and crystallized its central and southern regions. Post-Permian events have included anorogenic (mainly alkalic) intrusions and Mesozoic vulcanism of relatively limited extent in eastern Mongolia, in response to Mesozoic relaxation and rifting. Cenozoic basalts occur locally along deep crustal fractures, in which seismic activity continues today.

1.5 Within this diverse geological setting is an extensive series of mineral resources, with over 6,000 known showings/deposits of 80 different minerals. The most economically significant of these are base metals, gold, and fluorite.

1.6 **Base metals**² occur in northern, central, and southern metallogenic Mongolia. In the north and south the potential is greater for Cu-Mo and Cu-Au porphyries, while central Mongolia has Pb-Zn and Cu-Mo porphyry deposits. There are three principal types of deposits: late Paleozoic to early Mesozoic Cu porphyries (with Mo or Au), Cu-Ni magmatic segregations associated with gabbros of unknown age, and Paleozoic to Mesozoic stratabound copper. The porphyries are the most important economically. Mongolia also has a large number of middle to late Mesozoic low-grade Pb-Zn deposits in a variety of deposit types. The main Pb-Zn deposit types include skarns, mineralized explosive pipes, veins, and mineralized zones of middle to late Mesozoic.

1.7 **Gold mineralization** is widespread in ten main gold metallogenic provinces, occurring in the late Precambrian, early Cambrian, Paleozoic, Mesozoic and Cenozoic periods. The most significant gold deposits are associated with events that took place during the Permian, Triassic, and Jurassic periods; however, there is also likely to be significant potential in rocks associated with older events. Gold is known to occur in three main deposit types: lode gold deposits, bulk-tonnage disseminated mineralized zones, and placers. The extensive placer gold deposits found scattered throughout Mongolia were formed during the younger Cretaceous, Neogene, Pliocene, and Holocene periods. Interest has centered on alluvial placers. Relatively little modern exploration has been undertaken for hard-rock deposits, leaving large tracts of land under explored that could lead to significant new discoveries.

² Copper (Cu), molybdenum (Mo), gold (Au), lead (Pb), zinc (Zn), Nickel (Ni), and Fluorite (F).

1.8 Fluorite mineralization occurs throughout Mongolia in rocks of late Paleozoic to late Mesozoic age. The major formation of economically important mineralization took place during late the Mesozoic to late Jurassic and early Cretaceous periods. Fluorite mineralization occurs in two economic types, epithermal vein and metasomatic ore bodies. Three major fluorite provinces have been defined in Mongolia, the Northern Mongolian, Trans-Mongolian, and Southern Mongolian fluorite provinces, with the Trans-Mongolian province having the largest reserves and being the most actively mined. Other minerals of potential economic interest found in Mongolia are silver, rare earth elements, uranium, phosphate, and industrial minerals.

THE MINING SECTOR

1.9 Mining is the most important economic sector in Mongolia, accounting for about half of gross industrial output and 40 percent of export revenues last year. It directly employs over 12,000 people. Copper, gold, and fluorite dominate production, which with the exception of gold has been fairly static. The country also produces limited amounts of tungsten, salt, clay, lime and aggregates.

Table 1.2: Mongolian Mineral Production, 1997–2002

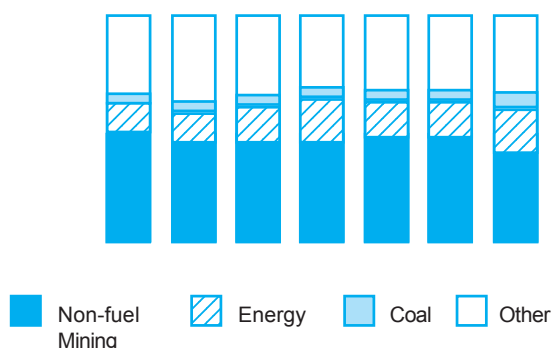
Mineral Production	1997	1998	1999	2000	2001	2002*	Growth (%/year)
Copper in conc. (t)	124,000	125,000	126,000	125,000	133,000	131,000	1.1
Molybdenum in conc. (t)	2,202	1,993	1,953	1,336	1,423	1,590	(6.3)
Gold (kg)	8,000	10,040	10,146	11,500	12,059	10,711	6.0
Fluorspar (000 t mined)	593,000	612,000	597,000	678,000	615,000	526,000	(2.4)

Source: Mineral Resources Authority of Mongolian (MRAM).

*Provisional

1.10 Industrial output is largely based on copper and gold. Mongolia has only one copper mine (Erdenet), which earns about half its foreign exchange and provides almost 25 percent of government revenues. Output from Erdenet could decline further as the head grade of the Cu/Mo mine decreases and world commodity prices maintain their secular decline. However, there are plans to compensate for this by further processing to produce higher value copper cathode and molybdenum oxide.

Figure 1.1 Mining's Contribution to Gross Industrial Output

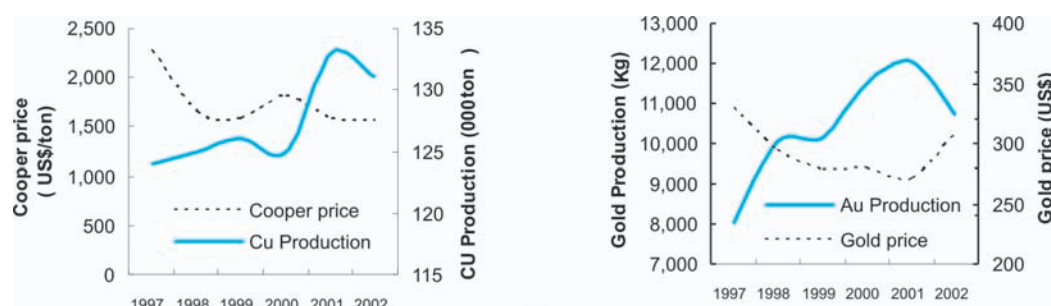


1.11 Gold production comes from placer operations, but output is declining as large readily accessible deposits with rich ore seams are depleted. Analysis of the placer mining sub-sector shows that smaller mines are being exploited, unit costs are increasing, and ore grades are decreasing. Without active exploration for new placer deposits, this trend is likely to continue as proven reserves are exhausted.

1.12 While copper production has increased steadily since 1997, the world copper price has decreased and

Mongolia's copper exports declined from over 27 percent of GDP in 1995 to 14 percent in 2001. Gold production also increased steadily until 2001, but with weakened prices. Although the gold price increased in 2002, production fell 11 percent from 2001.

Figure 1.2: Gold and Copper Production and Prices



Source: MRAM and London Metal Exchange

1.13 The government has a relatively new, competitive, and enabling mining law and actively promotes private sector participation and FDI. Since the introduction of the Minerals Law in 1997 and the abolition of the gold tax in 2001, Mongolia has seen considerable growth in private sector-funded mineral exploration as it attracted increasing funds in a highly competitive international mining industry.³

1.14 The government issued policy guidelines in 2002 outlining mineral development and sector promotional goals for 2002-10. This policy document includes a commitment to reinforce the already favorable legal environment for private mineral exploration activities. The guidelines also recognize that the general structure of the mining industry in Mongolia has moved away from state ownership and control, under which exploration was focused on developing deposits, regardless of the economics, toward a market-driven, private sector oriented industry regulated by the government. As they are considered to be important to the economy, the government has chosen not to privatize its interest in either Erdenet or Mongolroostsvetment, Mongolia's two largest companies, seeking instead technical alliances to improve competitiveness.

1.15 Mitigation of the negative environmental impacts of the mining sector is an integral part of the government's policy thrust and is enshrined in the Minerals Law and related acts. While the legislation embraces many aspects of international best practice, limited institutional capacity undermines the implementation of environmental laws and regulations at existing operations. This is being assessed separately under a Bank sponsored study⁴ as summarized in Box 1.2 and, accordingly, is not be dealt with further in this analysis.

³ US\$18M in 2002 (preliminary MRAM figures) up from US\$7M in 1997.

⁴ Rhienbrau Engineering und Wasser GmbH, Draft 'Review of Environmental and Social Policies and Practices for Mongolia', October 2003.

Box 1.2: Environmental Aspects of Laws and Institutions Governing Mineral Exploration and Mining

The Minerals Law contains provisions to address the environmental impact of mining activities (Articles 28-31). Relevant environmental protection agencies need to approve any exploration or mining activities. Licensees are required to prepare an environmental impact assessment, and an environment protection plan, which needs to be updated annually to ensure that pollution caused by the exploration activities does not exceed maximum limits. Investors are also required to report on steps taken to protect the environment and natural resources. However, licensees are not obligated to completely rehabilitate areas affected by mining activities, and to eliminate environmental dangers. They must deposit an amount equal to 50 percent of the environmental protection budget in a special bank account, to be refunded upon full implementation of the environmental protection plan. The Minerals Law does not refer, however, specifically to artisanal mining and also does not make any provisions for socio-economic impact assessments.

The State Inspection of MIT is responsible for monitoring exploration and mining activities and ensuring compliance with the laws on geology and mining, including environmentally benign and sustainable exploitation and use of mineral resources. The Ministry of Nature and Environment (MNE) shares MIT's mandate for carrying out inspections of exploration and mining activities to ensure compliance with environmental laws. At the local level, provincial and district governments are responsible for organizing and ensuring implementation of mining legislation and compliance with environmental protection, health and safety regulations, under the supervision and/or in collaboration with MNE and MIT inspectors. In 2002, with the goal of addressing the overlapping authorities of MIT and MNE, GoM issued a resolution on the reorganization of inspectorates, which provides for the establishment of a single Inspecting Agency reporting directly to the Prime Minister.

Existing environmental provisions have not led to environmental protection as it had been expected. The review of the environmental and social practices for mining, sponsored by the World Bank in 2003, identifies weaknesses in the legislative framework and institutional capacity. These include instances of sub-standard environmental mining practices due to a general weak environmental inspection and enforcement system, limited coordination and overlapping authority between regulatory agencies concerned and the mining industry, and emerging socio-economic problem areas such as the rapidly developing artisanal mining community. The review proposes solutions to address these problems, whose implementation could also be supported by an ongoing IDF Grant to MNE, and also by the new MIT-MNE joint inspecting authority that was recently established

Source: Based on the Draft Rhienbrau Engineering Report.

1.16 The past focus of government-led work was on discovering and categorizing all mineral deposits and occurrences regardless of their type, size, or viability. More recently, private investors, responding to an improved investment climate, have concentrated almost exclusively on three high-values, export metals: gold, copper, and zinc.

1.17 While placer gold operators are beginning to resume exploration to increase reserves, international investors are focusing on identifying and exploiting hard-rock deposits. Current evidence suggests that future growth potential in the mining sector lies in this area, with Borro Gold Mine and Tumurtiin Zinc Mine due to start production in 2003 and 2005. Smaller hard-rock gold mines, at Bumbat and Olon Ovoot, are also due to come on-stream in 2004 and there are a number of significant exploration prospects being assessed that could lead to substantial increases in output in the medium to long term.⁵

⁵ These include Oyu Tolgoi (Cu/Au), Gatsuert (Au) and Golden Hills (Au).

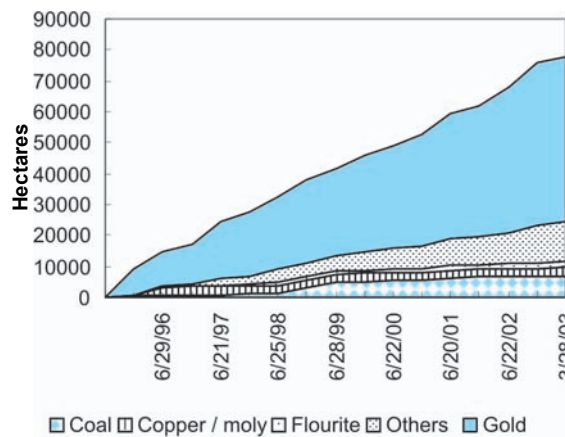
Structure of the Mining Industry

1.18 Excluding coal, 141 registered mining operations in Mongolia formally submit production data to MRAM; 94 percent are gold producers. Since the introduction of the 1997 Minerals Law the number of mining and exploration licenses issued by MRAM has increased steadily to the current 611 and 2,600, covering an area of 78,000 and 40 million hectares respectively.

1.19 Over 69 percent of licenses are for gold, 9 percent for coal, 6 percent for aggregates and 3 percent each for copper (moly) and fluorite. There are also a small number of licenses for iron, uranium, and zinc, rare earth elements, tungsten and salt. By far, the most significant increase in licenses has been in gold, which mirrors the increase in gold production from 8 to 12 tons over 1997-2001.

1.20 Over 420 companies hold mining licenses, the vast majority of which are small Mongolian companies. Over 70 percent (299 companies) hold less than 100 hectares and 50 percent (222 companies) hold less than 50 hectares. The five largest companies are; Altan Dornod Mongolia Co. (Russia,, Erdenet (Mongolia) Cameco Gold Mongolia (Canada,), Mongolgarzar Co. (Mongolia,) and Boroo Gold Co. (Canada).

Figure 1.3: Land Held as Mining Licenses



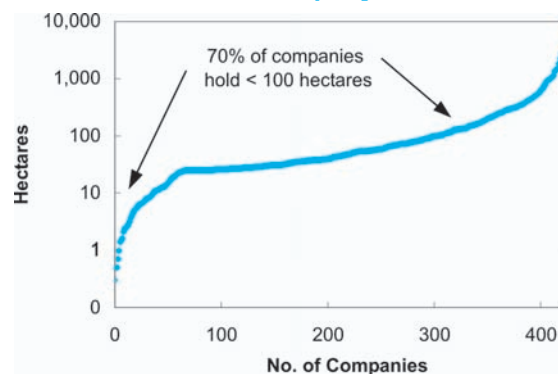
Source: MRAM, 2003

Structure of the Exploration Industry

1.21 Mongolia has undergone a rapid increase in mineral exploration. While the Minerals Law has played an important role in attracting foreign exploration companies into Mongolia, the rapid increase in the number of exploration licenses has been largely due to the abolition of the 10 percent gold tax and the widely publicized discovery of the Oyu Tolgoi Cu/Au deposit in 2001.

1.22 Since this discovery, the number of exploration licenses held has increased fivefold and the amount of land held increased by over 500 percent. There are now 2,595 exploration licenses in Mongolia covering 40 million hectares, 26 percent of Mongolia's area as indicated in map 1.1. Apart from the notable anomaly of the government being the largest landholder, through the Office of Geology, it is notable that only seven companies control 50 percent of the remaining license areas held. The four largest of these companies are foreign.

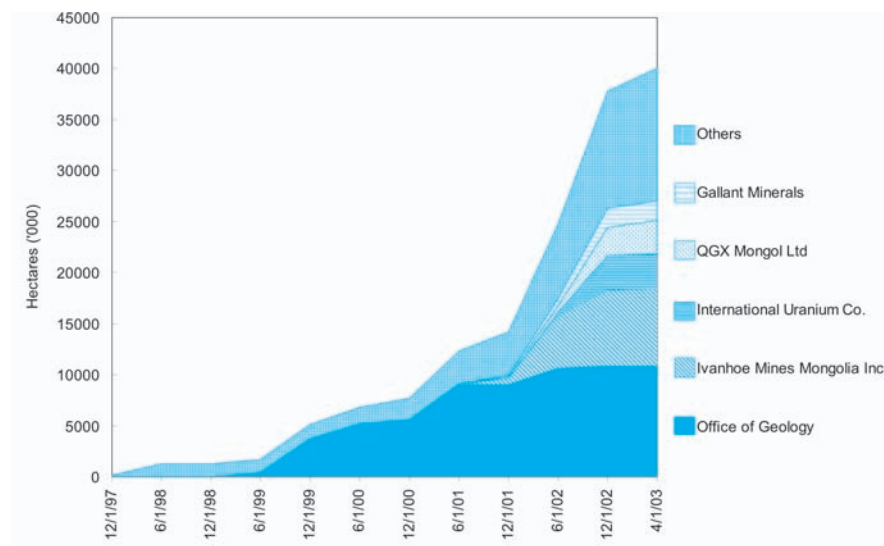
Figure 1.4: Mining Licenses held by Company



Source: MRAM, 2003

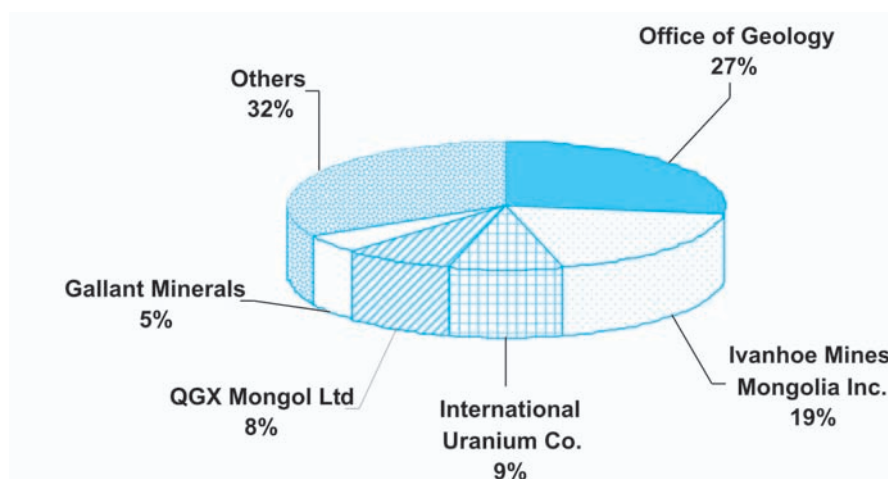
1.23 Exploration expenditure for 2002 is estimated at US\$18 million, up from US\$6 million in 2000. While these figures are not significant in global terms, they show a dramatic increase in expenditure that is unmatched worldwide. The increase in exploration activity has led to a number of interesting discoveries, which could represent significant sources of growth for the Mongolian economy.

Figure 1.5: Land Held as Exploration Licenses

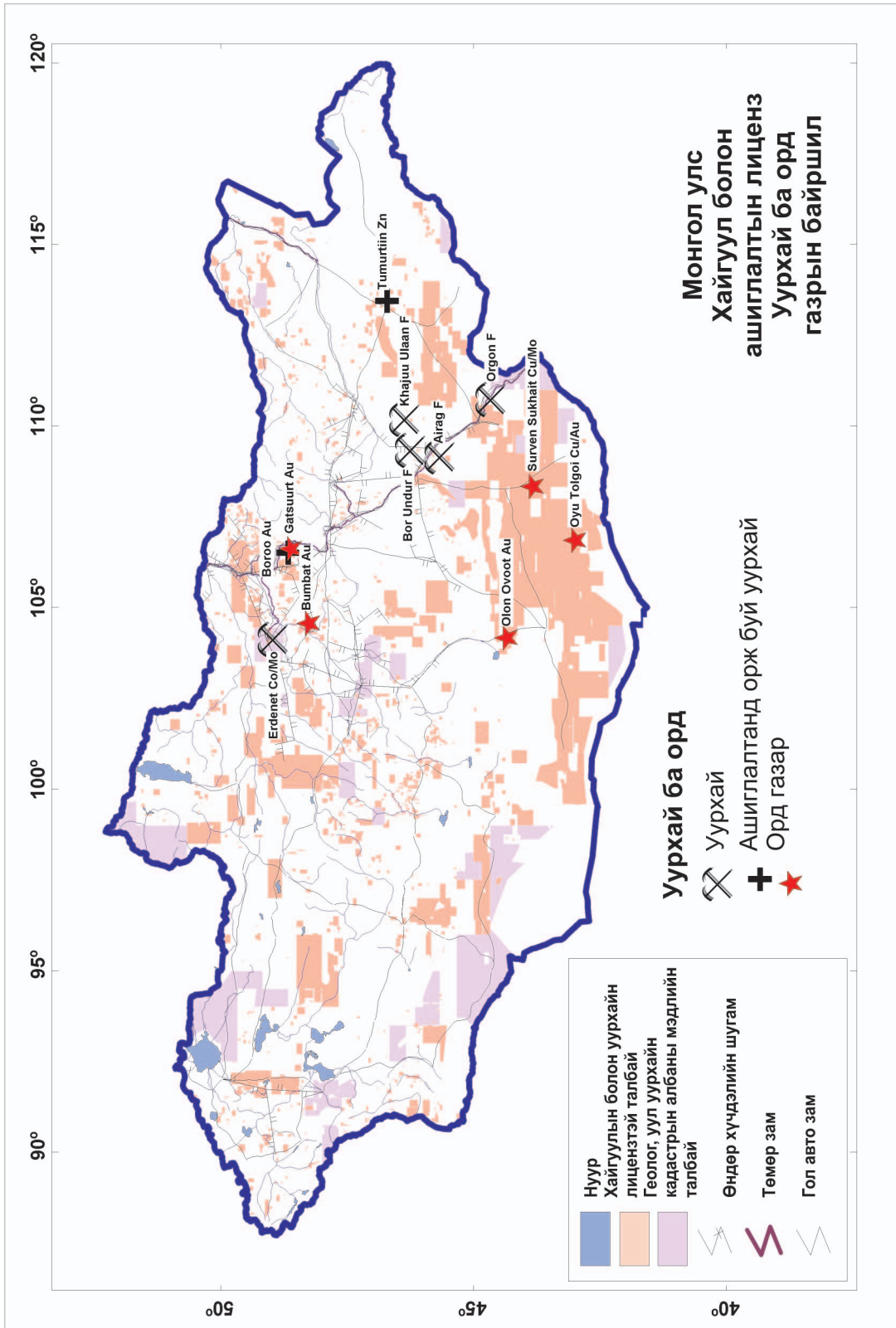


Source: MRAM

Figure 1.6: Exploration Licence Holders, April 2003



Source: MRAM, 2003



CURRENT MINING OPERATIONS

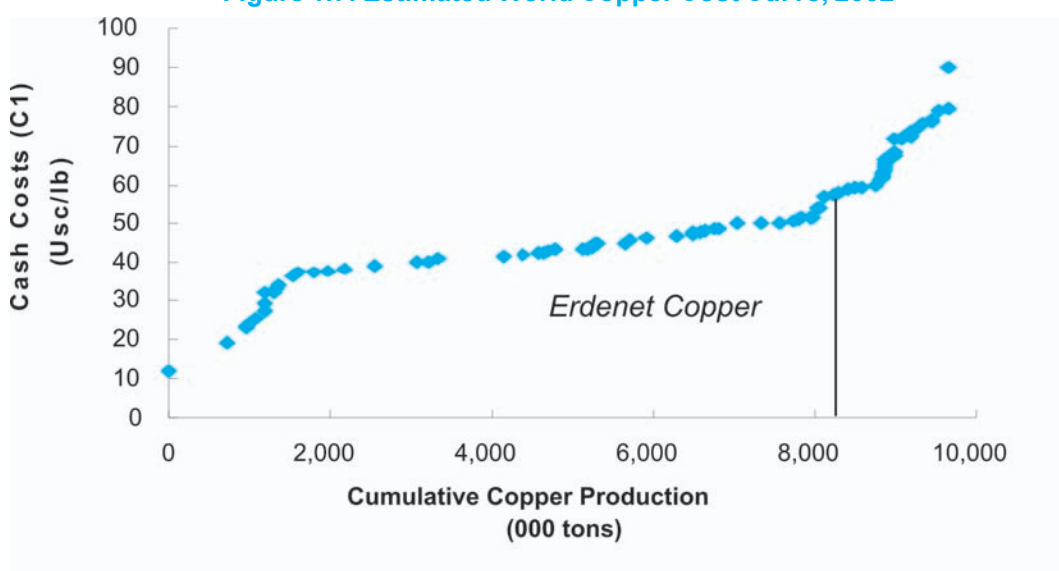
1.24 Although there are over 140 registered mining projects in Mongolia, the sector is dominated by the Erdenet copper/molybdenum mine, the fluorspar mines of Mongolrostsvetmet, and the top five placer gold mining companies, accounting for 81 percent of 2001 output. Copper, molybdenum, fluorspar and placer gold account for 99 percent of output with the remainder from small tungsten and industrial mineral operations.

1.25 *Copper Mining Erdenet.* The Erdenet copper-molybdenum mine is Mongolia's largest and has been in operation since 1978. The Erdenet Mining Corporation is a Russian-Mongolian joint venture company. Erdenet is a stockwork-type Cu-Mo deposit located within a large intrusive porphyry system. The mine, employing over 6,000 people, operates a conventional open pit on the south-west ore body, where proven mineable reserves are estimated to be 1.54 billion tons at 0.52 percent Cu.

1.26 As mining at Erdenet progresses into the primary sulfide zone, head grades are expected to decline further from 0.61 percent in 2002 to the average of the ore reserve (0.5 percent Cu). As Erdenet is state-owned and is essentially responsible for maintaining the economy of Mongolia's third largest city, it engages in a variety of non-mining activities such as farming, and has an extensive social support program, which amounted to 5 percent of costs in 2002.

1.27 With prices at US\$300 and US\$3,103/ton of Cu and Mo concentrate net of treatment and refining charges, Erdenet recorded 2002 sales of US\$163.1 million and pre-tax profit of US\$22.9 million. Despite weak copper prices, the mine has been profitable since 1999 and has had a strong and positive cash-flow for three of the last five years. However, it remains a high-cost producer and relatively uncompetitive, utilizing outdated mining techniques and processing technologies. To remain profitable in the global environment, significant technical assistance is needed to improve mineral recoveries, labor productivity and down stream processing.

Figure 1.7: Estimated World Copper Cost Curve, 2002



Source: Based on data from World Mine Cost Data Exchange Inc.

1.28 The cost of 2002 production was 57 US\$/lb Cu while the average cost for global producers was 40 US\$/lb as illustrated in Fig. 1.7. The company has examined the feasibility of using pressurized-leach and roasting technology to produce higher-value Mo-oxide, which would double the value of its output, and plans to begin building this US\$20m plant in the latter part of 2003 with production beginning in 2005.

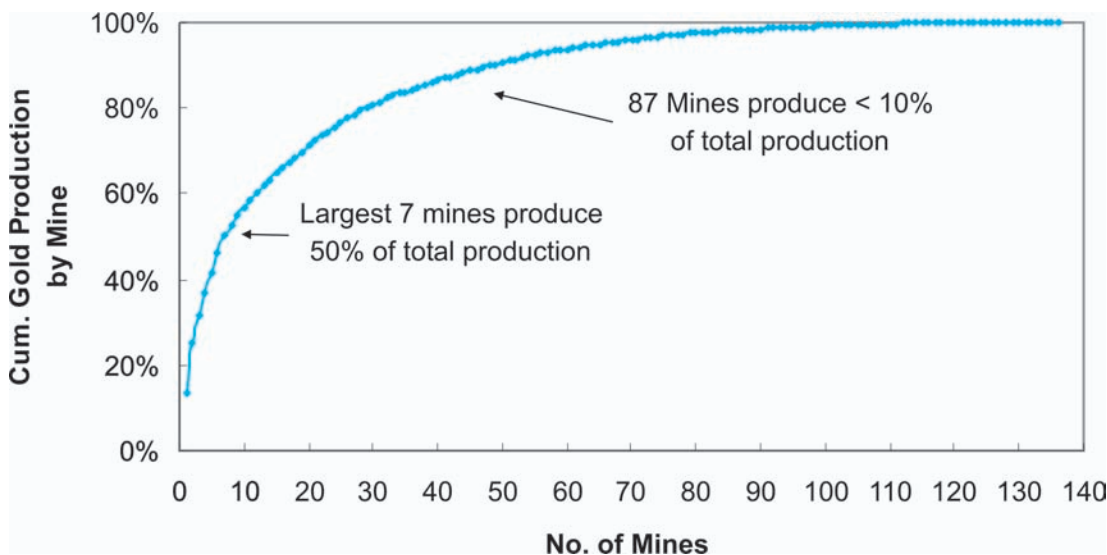
Erdmin Solvent Extraction Electro Winning (SX-EW). This plant was built in 1995 to extract Cu from Erdenet's tailings dam and stockpiled low-grade oxide ore. It can produce 3,000 tons of Cu cathode a year, but recent production has been about half that. Erdenet plans to acquire full ownership of the operation and increase output while using it as a pilot for a larger (20-25,000t) SX-EW plant.

1.29 Fluorspar Mining. Mongolia ranks fourth behind China, Mexico, and South Africa in world fluorite production with annual production of over 500,000 tons of ore and 180,000 tons of concentrate. Mongolia possesses twice the fluorspar reserves of China, yet only produces 6 percent of China's annual production. There are six fluorite mines in Mongolia, the four operated by Mongolrostsvetmet accounting for 92 percent of production.

1.30 Mongolrostsvetmet, a Russian-Mongolian joint venture, is Mongolia's second largest mining company and also has interests in coal and placer gold mining projects. Its largest project is the Bor-Undur open pit and underground operation, which in 2002, produced 121,260 tons of concentrates (67 percent of Mongolian production). Bor-Undur is 380km southeast of Ulaanbaatar in Khentii *aimag*. The Bor-Undur mine comprises more than 20 economic deposits of fluorspar with remaining proven mineral reserves of almost 6 million tons of ore

1.31 Mongolrostsvetmet produced 80,400 tons of metallurgical grade and 88,900 tons of chemical grade fluorspar concentrate in 2002, which was exported to Russia, Moldova, Japan and the EU. In 2002, the company received US\$75/ton of metallurgical grade and US\$105 to 115/ton for chemical grade concentrate. Net profit for 2002, including some minor gold and coal interests, was US\$15.48 million or a margin 2.8 percent. Without significant investment in new processing facilities, annual production levels are expected to remain static at around 110,000 tons of chemical-grade and 80,000 tons of metallurgical-grade concentrates in the short to medium term.

Figure 1.8 Placer Gold Production by Company 2002



Source: MRAM, 2003

Placer Gold Mining. Practically all recorded gold production in Mongolia comes from placer mines operated by Mongolian and Mongolia–Russian joint venture companies, although a very small number of hard-rock/supergene operations extract limited amounts of the metal. Most placer operations are found in the Zaamar, Bayangol, Tolgoit and the North-Central goldfields.

1.32 Production of 10.7 tons in 2002 was derived from 136 registered gold mines in 12 *aimags*. The largest 7 mines, as indication in figure 1.8, produce about half of annual gold output, while 87

smaller mines produce less than 10 percent. Over 40 percent of the production comes from *Tov aimag* and a further 35 percent from the Selenge, Darkhan Uul, Arkhangai *aimags* as shown in map I.1 in Annex 1.

1.33 The placer mines are located along current or paleo-river flood plains exploiting alluvial and colluvial placers by a variety of techniques, including large scale bucket-line dredges with on-board wash-plants and cable excavators, bulldozers and haulage trucks with static, semi-mobile or mobile wash-plants. Other large-scale mines are open pit operations where the placers and paleo-placers are mined with bulldozers and excavators.

1.34 The technology used by the larger placer operators in Mongolia is outdated, inefficient and costly. Many of the operating plants are based on Russian technology and equipment over 30 years old. This is reflected in poor mining techniques and recovery rates, and inadequate environmental rehabilitation. While placer companies estimate that they recover 90 to 100 percent Au, this cannot be true, given the large number of artisanal miners who extract gold from tailings. Unit costs vary widely, with approximately 60 percent of production at a unit cost less than Tg 10,000 and 12 percent at a unit cost higher than the average 2002 gold spot price of Tg 11,260.

1.35 An 11 percent decrease in gold output over 2000-02 points to structural changes in the placer mining industry as the large high-grade deposits exploited over the last 20 years are depleted. The number of mines and unit costs are increasing while production per mine and ore grades are decreasing. At current extraction rates mineral reserves will be substantially depleted by 2010 unless reserves are augmented through exploration. Overall gold production in Mongolia is set to increase, however, with the commissioning of the Boroo hard-rock mine, and it is likely that the wave of exploration activity in Mongolia will bring other hard-rock gold deposits on stream.

1.36 *Other Mining Activities.* In addition to the activities listed above, Mongolia has 14 coal mines, one tungsten mine, one salt mine, and a large number of small clay, lime and aggregate quarries. Numerous artisanal and small placer and hard-rock miners extract gold, coal, fluorspar, mercury, precious and semi-precious stones, salt, gypsum, limestone, chert, brick clay, sand, and aggregates.

NEW MINES UNDER DEVELOPMENT

1.37 Mongolia has a number of mines under development. Gold mines at Boroo, Bumbat and Olon Ovoot are due to become fully operational in 2004 and the zinc mine at Tumurtiin is scheduled to begin production in 2005.

1.38 Current proven mineral reserves are 9.402 million tons at a grade of 3.68 g/t, with potential to discover additional reserves. With a planned life of 6 years, the mine will be based around three small open pits. Ore will be mined using conventional drill, blast and truck/loader operations, and transported by trucks to a 5,000 ton/day gravitation and carbon-in-leach processing plant that will produce gold bullion. Local SMEs are supplying products and services for the construction and mining phases. In an attempt to employ as many local people as possible, Boroo Gold has established a training center to recruit and train mine staff.

1.39 *Boroo Gold Mine.* The Boroo Gold Mine is a medium-sized deposit 135km north of Ulaanbaatar containing 1 million ounces of gold. Construction of the mine began in 2002 and production commenced in December of 2003. The mine is connected to the main Ulaanbaatar–Darkhan highway via a 10km mine road, is 3kms from existing high-tension power lines, 12km from the nearest plentiful source of water and is 35 road kilometers from the town of Baruunkharaa, which has a railway station.

1.40 *Tumurtiin Zinc Mine.* The Tumurtiin Zn deposit in Sukbataar *aimag* is a 7.5M ton skarn ore body with average grade of 13.67 percent Zn. Operated by Tsairt Minerals, a Chinese (51 percent)-Mongolian joint venture company, the mine is due to become operational in 2005. It will produce an average of 69,000 tons of zinc concentrate over its 14-year life. The mine will have a capital cost of US\$38 million.

1.41 Over 700 people, mainly Chinese, will be used to build the mine; some 400, 85 percent of whom will be Mongolian, will be employed once it begins production. Tsairt Minerals has been encouraging local SME involvement through outsourcing support services, but with limited success.

1.42 *Bumbat Gold Mine.* The Bumbat gold mine commenced operations in 1997 but ceased a year later with the introduction of the gold tax. Mongolyn Alt Corporation plans to resume mining in 2003, with an initial production 200-300 kg Au. Bumbat comprises over 150 quartz veins, of which 7 are estimated to be economic. The deposit has estimated gold reserves of 10 tons Au with a cutoff grade of 3.0 g/t, hosted in a series of steeply dipping quartz veins that will be exploited by a series of shallow open pits. Plant recovery is expected to rise to 95 percent and total production is expected to reach 700kg Au by 2004. The mine is located 210 km west of Ulaanbaatar, in the Tuv *aimag* and has established water, power, and transportation infrastructure from previous mining operations.

1.43 *Olon Ovoot Gold Deposit.* Also due to start production in 2003, the Olon Ovoot gold deposit, 100 percent owned by Mongol Gazar, was discovered in 1994, and has a significant area of mineralization (1,173 kg Au). Mining will be open pit and with a stripping ratio of 1:1.2; ore will be processed initially at a rate of 300 tons/day. Reserves are estimated at 8.68 tons (270,000 oz) Au. Additional resources are estimated to be 50 tons of gold. Over 80 percent of the gold ore is free milling, with an 80 percent recovery rate and with an operating cost of US\$1.5 per gram for the first three years of operation. Refractory ore will be stockpiled for future processing.

1.44 Mongol Gazar estimate 2003 production at 1.2 tons of Au, increasing to 5 tons by 2005. Initial capital cost will be US\$6m. The deposit is 550km from Ulaanbaatar and 100km from Dalanzadgad, the capital of Omnogovi *aimag* and 40km from the town of Byan Khoshuu. 150 people will be employed at the mine, the vast majority of whom will be Mongolian.

INTERESTING EXPLORATION PROSPECTS

1.45 In addition to the operational and planned mines, Mongolia has a number of interesting mineral prospects, which have largely been discovered through the recent increase in exploration activity. Although none are due to come into production in the short term, they are significant and could play an important role in the growth of the sector in the longer term.

1.46 *Oyu Tolgoi (Turquoise Hill) Copper/Gold Prospect.* The Oyu Tolgoi gold, copper and molybdenum prospect is the most significant mineral discovery made in Mongolia since independence. Originally held by BHP in 1996, Ivanhoe Mines now holds a 100 percent interest in the project. Ivanhoe is a Canadian mining company that holds exploration licenses covering some 90,000 km² in central and southern Mongolia.

1.47 Oyu Tolgoi lies in the south Gobi Desert approximately 560 km due south of Ulaanbaatar. The deposit is typical copper/gold porphyry and has inferred resources of some 489 million tons, grading 1.08 percent Cu and 0.07 g/t Au and contains 11.6 billion pounds of copper and 1.17 million oz of gold. Recent drilling completed in April 2003 intersected a new high-grade extension of the ore body to the north, which will significantly increase indicated resources.

1.48 Four major ore-bodies have been identified at Oyu Tolgoi. Although Oyu Tolgoi represents a very significant ore body and is the subject of extensive and continuous exploration, it may

take another 5 to 10 years to develop a mine at the site due to lack of infrastructure. Copper concentrates from the mine will most likely be sold to Chinese smelters. The deposit is 360 km east of the main railway line between Ulaanbaatar and China, and Ivanhoe is holding discussions with the Chinese and Mongolian governments on building a 290-kilometre rail line linking Oyu Tolgoi to the Chinese city of Bayan Obo, which is connected to the Chinese rail network. The nearest significant power generator is at Tavan Tolgoi 200kms to the west and the water necessary to operate a porphyry Cu-Au deposit of the size envisaged has yet to be discovered.

1.49 *Gatsuurt Gold Prospect.* The Gatsuurt gold deposit 35 km to the east-southeast of the Boroo gold mine is undergoing reserves definition drilling and metallurgical studies that will likely confirm a geological gold resource similar in size and grade to Boroo.

1.50 *Golden Hills Gold Prospect.* The Golden Hills prospect has been identified along a 7 km strike length by ground geophysics and its Central Valley Zone has been drilled. Sulfide lenses with widths of 10-40 meters and gold grades of 0.2 -0.4 g/t Au have been intersected over a 1.5km strike length.

1.51 *Surven-Sukhait Copper/Molybdenum Prospect.* This copper/molybdenum deposit, 164 km southwest of the Zuun-Bayan railroad station, in the Dornogovi *aimag* in southeast Mongolia is one of seven porphyry copper-molybdenum occurrences within the Tsagaan-Suvargiin district, of which the Surven-Sukhait deposit is considered to have the greatest economic potential. Commercial ore reserves of the deposit have been estimated at well over 220 million tons at 0.54 percent copper, 0.019 percent molybdenum with minor gold and silver.

INDIRECT ECONOMIC IMPACTS OF MINING

1.52 Increased mining output can impact economic growth indirectly by affecting production factors accumulation, total factor productivity, or both. This indirect impact will result from the quantity and quality of fiscal expenditures (fiscal mechanism), the ability to acquire goods and services more efficiently produced abroad (trade mechanism), or the multiplier effects that expending income has in the economy (the income mechanism).

1.53 *The Fiscal Mechanism.* In addition to the ordinary taxes applied to economic activities such as the income tax, mining is usually burdened with royalties and other taxes. Thus, increased mining output raises fiscal revenues, and significant increases in a developing country dependent on mining can lead to a major increase in exports and expanded imports. The duties paid for these imports further raises fiscal revenues. In a country such as Mongolia, where fiscal revenues from mining, and imports are significant, an important expansion of its mining output would result in a large increase in fiscal revenues.

1.54 The fiscal revenues from mining expansion can be used to increase public investment in, for example, health services and education or infrastructure such as roads, or rural electrification. They can also indirectly raise private investment if they are used to reduce domestic public debt, making more financial resources available to the private sector. Well managed fiscal revenues from increased mining output can, thus, result in production factors accumulation and productivity growth, and, hence, in economic growth.

1.55 *The Trade Mechanism.* In small highly mining-dependent economies a large expansion in mining raises exports significantly as mineral and metals are largely sold in international markets. This provides foreign currency to increase imports of good and services required for increasing man-made capital in quantity and quality. This expansion in exports and in the economy's capital stock usually will take place through an appreciation of the exchange rate, which, if moderated, will not harm the international competitiveness of agriculture and manufacturing

industry. An increase in foreign currency will also facilitate the acquisition of expertise and technology from abroad, therefore, improving productivity. Thus, an increase in exports due to a significant increase in mineral production will favor growth through capital accumulation and productivity growth.

1.56 *The Income Mechanism.* Increased mining production augments the income of mining companies and their subcontractors and employees³⁴ which will be spent in goods and services that become the income of a second round of suppliers and their subcontractors and employees. This process will continue, multiplying the income generated in the expansion of the mining production along the interconnected chain of goods and services in the economy. Depending on the degree of unemployment or underemployment, this income multiplier-effect can be quite significant and foster growth by reducing idle labor and capital.

Table 1.3 Estimated Income Multiplier Effects in South American Mines

Mines	Investment	Metal produced	Multiplier
Inti Raymi, Bolivia	\$200 million	Gold & Silver	2.79
Yanacocha, Peru	\$492 million	Gold	2.53
Antamina, Peru	\$2 296 million	Copper & zinc	1.42
Escondida, Chile	\$2 300 million	Copper	5.7
Candelaria, Chile	\$902 million	Copper	1.76

Source: McMahon, G. and F., Remy (2001)

THE IMPORTANCE OF GOVERNMENT POLICIES

1.57 While minerals can contribute significantly to growth, governments and their policies for managing mineral wealth will ultimately define whether this potential is fulfilled or lost. Thus, a number of key issues need to be considered by the Mongolian economic and fiscal authorities. These include the absorptive capacity of the Mongolian economy and the policies required to overcome its constraints efficiently, the country's investment environment and the competence of its institutions, particularly the fiscal and financial institutional framework, and the variations of the real exchange rate vis-a-vis variations of growth in the export indicators of non-traditional export sectors. Their objective should be to avoid policies or programs that lead to fiscal unsustainability, unproductive investments, rent seeking behavior, and "Dutch disease" effects.

1.58 *Fiscal and Debt Unsustainability.* A large increase in fiscal revenues requires sound criteria for public investment and expenditure to translate it into production factor accumulation and productivity growth, lest the government falls prey to an expansive fiscal policy leading to excess investments and social welfare programs that saddle it with recurrent costs beyond its medium-term financial capacity. Loans to finance the consequent fiscal deficit could worsen the government's fiscal position and compromise debt sustainability. Over time this can lead to high inflation and macroeconomic and political instability.

1.59 Perhaps the worst response to a substantial increase in fiscal revenues from a mining boom is for governments to create or expand state-owned enterprises. These undertakings are likely to fail, leaving a legacy of fiscal debt and losses. Eventually, revenues from mining drop, subsidies to other sectors can no longer be paid, and protection becomes too expensive. Then, these sectors exposed to fierce competition are forced to contract, leading to slower or even negative growth rates.

1.60 *Rent Seeking Behavior.* When government institutions are weak increased fiscal revenues

from growing mining output may further affect growth if rent seeking and patronage penetrate the government. Growth is impaired because, although public investment increases, its productivity drops. Corruption usually reduces the quality of infrastructure, which increases the cost of doing business for the government and the private sector and leads to lower output and growth. Without good governance, a rapid increase of fiscal revenues originated in natural resources windfalls or aid flows will likely be associated with a decline in the quality of expenditure and lack of transparency and accountability in the use of these resources.

1.61 *Absorptive capacity constraints.* Even without corruption or rent seeking behavior, a large increase in mining fiscal revenues could lead to unproductive public and private investments because of absorptive capacity constraints, such as weaknesses in public expenditure and financial management, weaknesses in policies determining the broad investment climate, and infrastructure bottlenecks. Under these circumstances, public investments in projects with very low or even negative social returns could be carried out. In absence of profitable alternatives in which to invest additional income, private investments would turn to the real estate market, leading to construction booms and real estate speculation that can eat up most of the windfall.

1.62 Unproductive investment booms can have strong historical foundations and have been a typical trap for developing countries eager to diversify their economies.

1.63 *Dutch Disease.* A significant increase in mineral production can also affect the competitiveness of the non-minerals export industry, notably manufacturing, commonly called “Dutch Disease.” Due to the mining output expansion, input factors, especially labor, will move toward the mining industry, usually drawn by increased wages. This slows manufacturing growth, which can affect the entire economy, as manufacturing industry is considered to have greater dynamic externalities and learning effects than mining. Thus, an expansion of mining at the expense of the manufacturing industry can reduce productivity growth. The intensity of this effect will depend, however, on the level of unemployment, as the mining production expansion taps into idle labor. The risk of Dutch Disease is minor for the Mongolian economy as, like many low-income developing countries, it has idle capacity to utilize for expanding mining production, if required.

1.64 *Productivity growth.* An economy can also lose if mining expansion causes an appreciation of the exchange rate that impairs the competitiveness of domestic manufacturing as imports become cheaper and exports less competitive. Such a situation, however, is conditioned by the way the additional income or revenues from mining are managed. If, for example, mining revenues are largely invested in improving the quality of labor, i.e., through better health and education services and infrastructure, the decline in productivity growth can be compensated in the medium term. Moreover, because of the large productivity gap between industrialized and low-income developing countries, it is possible that a low-income country could experience a sustainable real appreciation of its currency if low-cost productivity increases were achieved. Thus, as long as the additional revenues from mining expansion are used to unlock low-cost productivity gains, an appreciation of the exchange rate will affect neither manufacturing nor economic growth.

REGIONAL ECONOMIC DEVELOPMENT

1.65 Major technical changes over the past 50 years have made mining at once a global and an enclave industry. Many inputs are bought far from where mines are located, and minerals and metals are sold in commodity markets to feed manufacturing industries often located thousand of kilometers from where they were extracted. The less developed or more isolated a region, the stronger the tendency for mining to develop as an enclave.

1.66 Mining industries bring developing countries infrastructure that can support regional

development and diversification, although up- and downstream linkages are often too weak to create significant dynamic externalities such as learning, innovation, and SME promotion. In the last decade some multinational mining companies have worked to strengthen their upstream linkages with SMEs as an instrument for promoting regional development. This trend could help development in mining economies such as Mongolia's.

1.67 *Upstream Linkages.* Significant increases in mining production can lead to increased regional demand for intermediary goods and services. Part of this demand will be for infrastructure, such as roads (or ports) whose development - along with mines and processing facilities - can mobilize large and medium enterprises. That infrastructure creates positive, although static, externalities, such as reductions in transportation costs, better access to markets, and requirements for maintenance. Another part of demand will be for intermediary inputs, such as machinery, equipment, chemical reagents, transport services, and electric power, opening possibilities for developing a diversified chain of suppliers. There is scope, therefore, to improve the information available to buyers and sellers about each other's needs and capacities to strengthen the links between large mining operations and local suppliers

1.68 One priority objective of Mongolia's Ministry of Industry and Trade (MIT) is to increase employment through SMEs, which play an important role in the Mongolian economy. SMEs began to appear in 1990 with the introduction of the free market economy, and by 1997 they produced more than 60 percent of Mongolia's GDP and accounted for 80 percent of the workforce (480,000 people). Most are privately owned family businesses and a third are managed and owned by women.

1.69 A small number of companies are already supplying services to mining and exploration companies; as the mining sector in Mongolia is due to grow at a moderate rate over the next ten years, there is significant potential to expand support industries. The majority of mines developed are likely to be small to medium and geographically diverse, and could well create significant domestic demand more fully developed in IFC's scoping study on SME linkages with mining section in Mongolia – June 2004 for smaller suppliers of good and services. Evidence of this can be found at the Borro Gold mine, where the mining company has contracted a number of local companies to carry out construction. SMEs are now supplying maintenance, haulage, catering, lime supply and transportation services to Borro and this level of SME activity is expected to be maintained during the mining phase as local firms adapt to the needs of the mining company.

1.70 As new mines come on-stream there is potential to develop SMEs to supply support goods and services. This could reduce the cost of importing substitute goods and have a marked impact on local employment with the additional benefit of linking mines and local communities. Programs are required to incubate and nurture fledgling SMEs, as the general skills base in Mongolia is low, especially in IT, accounting, marketing, promotion, finance, and general management.

1.71 There is also potential in the informal mining sub-sector, where there is broad demand, large numbers of unregistered micro-enterprises have emerged, and structured assistance could lead to more sustainable development of the rural economy. Although the transformation of informal miners into responsible SMEs will require considerable capacity building and support of all involved stakeholders, it should be regarded as an opportunity to promote local community development.

1.72 *Community Development.* The legal framework for mining seldom gives local communities rights to participate in the benefits of mining activities. Since the 1990s, however, there has been increasing recognition that communities should share in those benefits through (i) land acquisition and compensation; (ii) economic benefits sharing, and (iii) social programs. Mining companies required to compensate communities for land they acquire should recognize that the value of

land is often less important than the need to adjust traditional ways of living to the changes that the mining operation will bring. Thus, the most advanced compensation agreements provide displaced landowners employment in the mine; help create spin-off business relating to mining activities, training, and capacity building. Only this type of approach can effectively compensate landowners and assist them in acquiring the capabilities to use financial resources as an alternative asset to land.

1.73 In most developing countries fiscal revenues from mining do not reach local communities where the minerals deposits are located, which implies that remote communities close to mining operations have not benefited from the mining surplus partaken by the state through the taxation regime. This has become increasingly untenable in the developing world and is likely to be reversed. Local allocation and management of part of the mining fiscal revenues will be a key component for fostering local economic development. The Papua New Guinea's "Development Forum" as described in Annex III warrants consideration by Mongolian policy makers, especially at a time when the fiscal and regulatory framework for mining is being formulated.

1.74 Mining companies have, in the absence of the above mechanisms, resorted to establishing foundations to deal with the pressures for development of the surrounding communities. Foundations are institutions primarily supported by mining companies but capable of leveraging funds for community development from other sources such as private donors and public funds. Managed independently from the mining company, these foundations are an alternative for filling the void left in education, health, and basic infrastructure in remote communities by the neglect of distant state or provincial administrations. In the large majority of developing countries, foundations were established as mineral production expanded, especially by multinational mining companies and have evolved from institutions that defined what is best for the communities to more opened institutions with greater sensitivity to community needs to accumulate social capital as a prerequisite for development. Notable examples are the Rossing Foundation in Namibia and the Productive Development Corporation of Chile's Antofagasta region.

INFRASTRUCTURE REQUIREMENTS

Table 1.4 Mongolian Mines, Prospects and Major Infrastructure

Mine / Prospect Name	Distance from Electricity supply (km)	Distance from railway	Distance from major road	Distance from major river
Boroo (Au)	19	12	18	15
Tumurtiin (Zn)	203	360	10	125
Oyu Tolgoi (Cu/Au)	340	340	120	300
Bumbat (Au)	12	67	17	12
Olon Ovoot (Au)	125	390	40	36
Gatsuurt Au	32	12	12	12
Surven Sukhait (Cu/Mo)	185	185	20	360

Source: MRAM

1.75 An important consideration in Mongolia's desire to develop the mining sector is its low level of infrastructure development. A well-developed infrastructure is vital for mining. Large and medium mine developments, such as those likely to occur in Mongolia, will require significant power, water, and transportation infrastructure as indicated in Table 1.4 below. Some of the prospects described in this study may not be developed because the cost of building infrastructure will make them uneconomic. The government, therefore, needs to give serious consideration to

developing infrastructure in Mongolia over the next ten years, as the location of new roads, railways and power plants will have major impact on the potential development of the mining sector.

1.76 Mongolia's largest prospect, Oyu Tolgoi, is located in one of the remotest parts of the country and exemplifies how important infrastructure is. The prospect is over 300 km from water, power, and transportation facilities. While water will probably be found through drilling in the vicinity of the prospect, a road or railway needs to be built to the site from China. A power source also needs to be established, either by building a power plant at the mine or running high-voltage lines from the Mongolian or Chinese national grid. While the prospect's operators are examining the possibilities of building a railway from China to the deposit site using state funding, it is certain that the cost of providing the necessary infrastructure will dramatically increase the capital cost of developing this prospect and may end up delaying its commissioning by a number of years.

1.77 The Tumurtiin Zn mine is not close to a railway line, the preferred and most cost-effective mode of transporting concentrates. It will therefore be forced to transport its concentrates either by truck 360kms to the nearest railway station and from there by railway to smelters in China, or by truck alone to China through the border crossings directly south of the mine. The mine will also require a 20MW power plant.

1.78 While small to medium gold mines do not require the same level of infrastructure as large bulk-tonnage base metal mines, they still require adequate two-lane tarmac roadways, electricity, and water for their operation. Borro, Bumbat and Garsuurt are extremely fortuitous to be positioned so close to road, railway and power networks. Water is also readily available. However, the Olon Ovoot deposit located in the South Gobi Desert is some 100 km from national grid and will therefore either need to construct a 10 MW power plant on-site or extend the grid to the supply the mine operation. The mine will also need to build a two-lane roadway from the road network to the site.



ARTISANAL MINING

CHAPTER 2

BACKGROUND

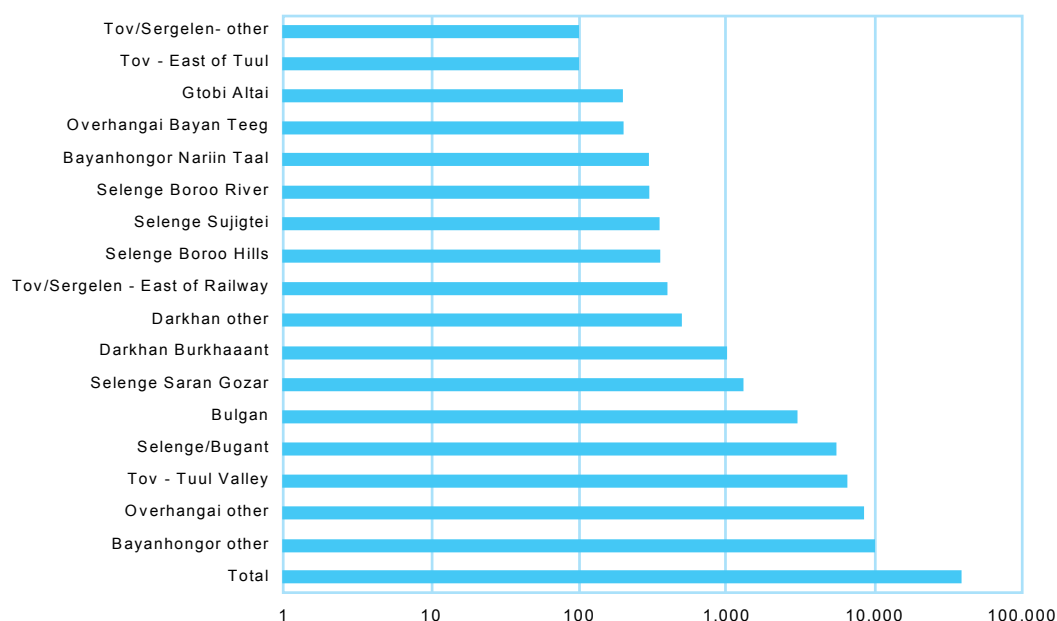
2.1 The government's mining policy since independence has been directed toward commercial development of the sector and increasing its contribution to export earnings and economic growth. Despite these policies, a subset of mining activity that is neither formally organized nor authorized, but is highly labor intensive, technologically simple, and low cost emerged in the past decade. This artisanal⁶ activity has become important in both economic and political terms. Coal, fluorspar, gold, and a variety of industrial minerals are produced using artisanal techniques and sold informally. Locally, artisanal mining is called hand mining, and the people involved have come to be referred to as ninja miners.⁷

2.2 Artisanal coal mining began in 1993; after the closure of the Nailakh coal mines following a major mine fire. Currently around 1,000 people are working at informal operations in this area. Artisanal processing of gold ores began in 1991 at the site of an abandoned gold recovery plant on the Borro river, where some old stockpiles of gold-bearing vein material from the state-owned, but closed Tsagaan Chuluut Gold Mine remained. At the same time, miners began washing contaminated soils and sediments near the plant, recovering metallic mercury, which was then used in their own gold recovery process. About 300 people remain at the site. Although the processing of residual ores ended in 2000, the Boroo miners began to expand their activities in 1996/97, selling excess mercury to other artisanal miners in the Boroo district who had started mining gold bearing quartz veins in the neighboring mountains. This activity currently involves around 1,000 people, most of whom are drawn from local agricultural villages. In 1997 the reclamation of gold bearing materials near licensed gold placer mining operations also began. The materials discarded by commercial placer mining became the bread and butter of artisanal mining in Mongolia.

2.3 Artisanal gold mining originated in the north and central *aimags* of Selenge, Darkhan-Uul and Tov, and has begun to spread to other areas. What started as a seasonal activity involving hundreds of people, has in the past six years, escalated into a year-round livelihood involving thousands. The most recent estimate by the Ministry of Industry and Trade is that 30,000 people are involved on a year round or seasonal basis, with over 95 percent working in the commercial placer areas (Figure. 2.1). Unofficial estimates suggest that the numbers may be higher and will continue to grow.

⁶ Artisanal mining involves individuals and families who work with simple tools and equipment to access, extract and process minerals, usually informally, without land or mineral rights, outside the legal and regulatory framework.

⁷ The term comes from the circular green pans many of the gold miners hang on their backs while walking to and from the gold fields. From the air, the pan makes them appear to resemble the "ninja turtles" of movie and cartoon fame.

Figure 2.1 Estimated Informal Gold Miners in Principal Mining Aimags

Source: *Overview of Artisanal Mining Activity in Mongolia*, (report prepared for the World Bank), April 2003.

ARTISANAL MINING AND POVERTY IN MONGOLIA

2.4 Artisanal mining is practiced in many parts of the world. In 1999 the International Labor Organization (ILO) estimated that at least 10 million people were directly engaged in artisanal and small-scale mining activities in developing countries, with another 80 to 100 million directly or indirectly dependent on them for their own livelihoods or sustenance. Artisanal mining activity has expanded during the past decade, mainly in response to continuing urban and rural economic stress, and especially in areas where precious minerals are found.⁸ Both the numbers of people involved and production levels have continued to grow since 1999. Despite the committed efforts of some governments and development agencies, much of this activity remains informal, ad hoc, and outside any legal/regulatory framework. With it often come serious downside effects related to health and safety, environmental degradation, resource recovery, and fractious relationships between miners, local communities, mining companies and local and central governments.

2.5 In Mongolia experience with this type of mining is recent and limited. Unlike in many other developing countries, artisanal mining is not part of a long-standing traditional subsistence economy. The initiation of informal mining and its dramatic growth over the past decade, are manifestations of local efforts to counter some of the more pernicious effects of the economic restructuring process: job loss, high inflation, declining real incomes, and the “reduced capacity of the state to provide economic security and alleviate hardship.”⁹ People have had to find their own solutions, most often outside the formal economy. Thus, informal underground mining of coal is undertaken by former state miners who lost their jobs when the Nailakh coalmine was closed. Rural households, which have evolved a diversified rural livelihood strategy involving subsistence farming, herding, and artisanal mining, undertake underground mining of quartz veins for gold. Near-surface and surface mining of gold-bearing materials in the commercial placer mining areas is undertaken mainly by urban and rural economic refugees, who, driven by deteriorating economic circumstances and a lack of viable alternatives in their home areas, have come to the placer gold fields to try to secure their economic survival.

⁸ The 1999 ILO numbers are considerably larger than estimates made only 7 years earlier.

⁹ Griffin, Keith, 2001, ‘The Macroeconomics of Poverty,’ in UNDP, *A Strategy for Poverty Reduction in Mongolia*, Ulaanbaatar, July, p 12

2.6 The gold placer mining areas have become the principal target of the *ninja* miners. While the surge in commercial development of Mongolia's extensive placer deposits in the early 1990s resulted in dramatic production increases, these increases used inefficient mechanized mining and processing systems.¹⁰ Consequently, much gold has effectively been lost by the Mongolian and Russian owned commercial enterprises. These have been left behind in oversize tailings material that could not be processed, in placer material on the floors and sidewalls of mined out areas that could not be extracted by the bucket wheels, and in the overlying lenses of gold bearing ores in the overburden that was discarded by the draglines. These rejects provide a relatively rich and readily accessible resource base for artisanal mining, which was self renewing and grew as commercial production using the old technology continued to expand.

2.7 This material can easily be located and exploited. While artisanal mining is generally difficult, dirty and dangerous work, and often occurs in areas far removed from social and educational infrastructure and amenities, the gold bearing materials have been relatively easy to locate, the tools and methods needed to retrieve the ore and recover the gold, affordable and simple, and the gold itself, easily marketable. As most of these areas were still commercially active, there was already in place a modest level of infrastructure and support.

2.8 Consequently when the droughts and *dzuds* occurred from 1999 to 2002, the placer mining areas were a logical haven, able to accommodate increasing numbers of people and new waves of migration, given the abundance and quality of the reserves available for both commercial and artisanal miners. The castoff products of inefficient commercial mining had become the *sine qua non* of the economic survival strategy of tens of thousands of indigent urban and rural people.

2.9 The spread and growth of artisanal mining was related as much to macroeconomic and policy factors as propitious geology. The rather late emergence of informal artisanal gold mining relative to other kinds of informal activity may be understood in a number of ways. Part of it may have been that people were not yet ready or desperate enough to abandon established networks and social support systems in their home areas for the uncertainties of life and the risks of failure in a strange place undertaking a strange and unfamiliar business. Another part of it may lie in the fact that the first formal and informal responses to the economic crisis of 1990-95 were urban based. The inadequacy of these responses together with the failure of macroeconomic policies and programs, including the privatization of agriculture, forced people to broaden their search for alternative livelihoods. Nonetheless, it is clear that the *dzuds* contributed to major distress migrations to the area and growth in artisanal activity arose more out of necessity than choice.¹¹

THE DEVELOPMENT DILEMMA OF ARTISANAL MINING

2.10 The attraction of artisanal mining, not as a preferred occupation, but as part of an economic survival strategy been explicitly recognized by a variety of formal and informal interest groups in Mongolia. In its Poverty Reduction Strategy Paper (PRSP), the government acknowledged that the transition to the market economy cost many formal jobs, and as a result, people started to exploit the environment excessively by breeding livestock that exceeded pastureland capacity, extracting mineral resources, and hunting and collecting fruit and nuts. In a parallel multi-

¹⁰ These technologies were originally developed in the 1930s in Russia for mining and mineralogical conditions that are not present in Mongolia.

¹¹ Recent research has confirmed that this growth pattern is poverty driven and opportunistic, and that most miners are involved for survival reasons alone. A Mongolia Business Development Agency survey in the mining areas suggests that 55 percent of the informal mining population is made up of destitute or near destitute families that lost their herds during the *dzuds*, their rural incomes with the privatization of agriculture, or their formal sector jobs in the urban areas in the past five years. Thirty percent are part-time or seasonal miners working to realize specific goals, such as paying for education, paying off debts, purchasing consumer items, or to make up the difference between marginal and living wages (Murray and Grayson, *ibid*, pp 56-57)

stakeholder exercise, the drafting of the country's rural development strategy during 2002, it was noted that the most rapidly growing employment in certain rural areas is unregistered mining.

2.11 The artisanal mining economy has become a *de facto* part of an informal social safety net in the face of persistent and deepening poverty. At minimal cost to the state, it served to allay poverty for many people, and created new economic opportunities in the mining areas. A broader informal economy has also developed to service the miners' needs. This includes fuel supply, shaft drilling, catering, ore and people transport, lodging, food and hardware provisions, gold purchasing, recreational activities, and hair care. Semi-permanent settlements attached to informal mining have begun to appear, such as the mining community called "Persian Gulf" in the Tuul Valley of the Zamaar goldfield. This stands in sharp contrast to formal or licensed mines operating in the same areas, which function as enclaves that spin off most of their economic benefits to established larger suppliers in urban areas.

2.12 Despite the significant opportunity that artisanal mining affords many Mongolians during difficult economic times, it has been criticized by a number of different quarters. This has come from commercial miners with whose existing or planned operations it interferes; local authorities for whom it presents a growing administrative challenge and burden on public resources; and central government agencies and public institutions for whom it represents a dangerous, damaging and illegal business.

2.13 International experience demonstrates that under the similar economic conditions and without viable options for alternative livelihoods, the political price and the social and economic costs of trying to eliminate artisanal mining would be high. Yet to leave the situation unchecked presents other social, environmental and political risks that most governments would find difficult to accept, which gives rise to the inherent development dilemma of artisanal mining. That is, can the potential negative impacts of this activity be avoided, minimized or mitigated, while maintaining or even expanding its rural income, business, and employment generating potential?

DISTINGUISHING CHARACTERISTICS OF ARTISANAL GOLD MINING IN MONGOLIA

2.14 While the artisanal techniques and organizational structure of the sub-sector are similar to those elsewhere, there are a number of distinguishing characteristics to the challenges and possibilities it faces. These special features are set out in the description of artisanal gold mining in Mongolia in Annex XI, and summarized below.

1.15 *Recent emergence.* Mining started in 1991 at the Boroo river gold recovery plant, then spread to hard rock gold areas in the Boroo district (1996), and only began in some of the commercial placer mining areas in 1997, taking off with the *dzuds* of 1999-2001

- Few independent professional miners. In contrast to traditional artisanal mines elsewhere, the vast majority are miners by necessity not choice.
- Self-renewing ore reserve in the placer areas. Raw material is constantly topped up by the inefficiency of commercial mining methods and technologies.
- Geographic concentration of activity on licensed and mined lands. Activity is concentrated in the commercial placer mining areas, within the leaseholds of the commercial mining companies and typically on land that has already been disturbed. The government has explicitly tried to restrict artisanal activity to already disturbed sites, to prevent new environmental damage and exploitation of resources amenable to commercial mining.
- Artisanal miners have been the followers. In almost all the mining areas, commercial operations preceded artisanal mining. Elsewhere the situation is reversed, with

commercial miners following artisanal miners, who as “barefoot prospectors” have been the main indicators of prospective ground.

- Seasonal nature. Mining activity peaks during the summer in the placer areas; also with a growing year round component in both placer and hard rock areas.
- Multiple objectives, multiple results - poverty alleviation, entrepreneurship and education. This activity has in a short time become a significant force for poverty alleviation in both urban and rural areas and a key component of a diversified livelihood strategy for sedentary agricultural communities, fostering commercial entrepreneurship and SMEs both in mining and more distant urban areas, and providing critical financial support for the education of urban youth, at all levels¹². It has also resulted in a variety of important economic and social benefits within the mining areas¹³.
- Family focus. More than in many other artisanal mining areas, the family is the regulatory self-selected mechanism for work and social organization and interaction. Work units are mostly formed by members of an extended family, including children at certain times of the year and in specific capacities. This lends social and economic stability to the venture, as work is centered on securing and improving the economic well being of the family, including those not directly involved in the mining activity¹⁴.
- Adaptability, innovation and ability to integrate new ideas. These relative newcomers to mining have shown an ability to adapt to changing circumstances, to try out and adopt new or modified technologies to improve their own productivity, or to solve problems that constrain their ability to produce.¹⁵

2.16 *Involvement of adolescents and children in the handling of mercury.* This practice is thus far limited to the hard rock gold mining area, where mercury is used for the recovery of fine gold; while adolescents are often involved in the amalgamation process, some, especially younger ones, are also responsible for the roasting of the amalgam, which if not carefully managed will expose the child to toxic mercury fumes.¹⁶

2.17 *Excessive and sustained use of intimidation and force against miners.* This is mainly by the private security force of the commercial mining companies, whose job is to protect the company assets. With increasing frequency, this has turned into verbally and physically abusing miners, destroying their property and stealing their gold, even in areas outside license areas.

2.18 *A boom situation but not yet a boomtown.* As with other countries, artisanal gold mining, however chaotic, has its own set of self-generated rules of conduct and interaction that have evolved with time and increasing experience. These unwritten rules, which reflect the family

¹² Income that is generated by a part of the migrant seasonal labor force is reinvested in education and training and in other commercial and business interests..

¹³ The artisanal miners clean up after the dredge operations, and extract additional gold that would otherwise lost to the country. This production does not directly augment the national treasury/export earnings. Nonetheless it does serve as a safety net and relieves ‘political’ and even ‘fiscal’ pressure on the government to create employment opportunities or provide welfare assistance. This has spawned other SMEs, to service both the mines and the mining families, which support remittances to family members living in other areas. This extends the geographic reach of the social safety net and contributes to the development of the family’s future, e.g. when it is used to cover educational/living expenses of dependents.

¹⁴ Remittances to family living elsewhere are a common feature; this money often goes to school and living expenses of children and a parent or other relative who have stayed behind.

¹⁵ Examples include the rapid changeover of panning equipment from wood to metal to plastic, the use of torches or heated stones to warm wash water, the miniaturization of larger Russian or other pieces of equipment to make them portable and affordable (drums and water jets, vibrating screen classifier), the adoption of winches and winders introduced from the coal fields.

¹⁶ The job of roasting amalgam is often reserved for younger children, especially girls. This job is the least physically demanding associated with the mining and processing operation; this may be the reason it is assigned to children, as it seems that the hazards associated with this operation are not recognized.

focus of work and community, regulate relationships between groups and maintain a reasonable level of social order and stability in the mining areas.¹⁷

CURRENT ISSUES AND INSTITUTIONAL RESPONSES

2.19 *Placer mining of valley bottoms.* Valley bottoms, already seriously damaged by dredge and dragline operations, have been further hurt by informal mining operations. The government has chosen to try to minimize the environmental footprint of artisanal mining by limiting it to such areas. This has not always worked, as informal mining has sometimes spilled into adjacent virgin areas, and continued until the miners were removed by private or public police forces.

2.20 *Placer mining of alluvial terraces.* License holders have graded mined out sites and waste dumps in some areas.¹⁸ These areas have become points of contention when artisanal miners have dug fresh pits in search of residual pockets of pay material.

2.21 *River bank panning and washing of materials.* Of increasing concern is the extensive washing of materials along the river banks, which has increased sediment loads and water turbidity. The government has proposed to ban this practice in the law on artisanal mining.

2.22 *Hard rock mining in protected areas.* Informal miners have begun working in “protected” areas, but the extent of the threat remains to be more clearly defined.

2.23 *Deforestation.* Deforestation has also occurred around the hard rock mines as timber is removed for mine support, heating, and cooking. The extent of the damage from artisanal mining remains to be more concretely defined.

2.24 *Mine Safety.* In 2002, approximately 100 artisanal miners are known to have died in mine accidents: ten were coal miners, the rest gold miners.¹⁹ There is no data on the number injured, or on the number of near misses. Only when the Mine Rescue Service (MRS) responds to a call for help are the details of an accident recorded.

2.25 The service, originally organized to assist the state owned mines, estimates that 60 to 70 percent of its work is with informal miners. It responds to calls for rescue assistance but also for training in safety and hazard identification. In 2002 MRS responded to 30 calls for assistance; 27 of them from the artisanal coal mines of the Nailakh district, 3 from artisanal gold mines, and none from large mines or processing plants. All the Nailakh coal miners, around 1,000, received training in 2002, while only a few hundred gold miners were reached. MRS efforts appear to be misdirected, and should focus on the gold miners, but the service has its headquarters in Nailakh, with much smaller units based in three other places. Although MRS has a national mandate, not only for rescue, but also for training, it is understaffed (around 50), and consistently underfunded.

2.26 *Mercury Use and Exposure.* Mercury is thus far not an issue in the placer mining areas, where it is not used by informal miners. The mercury issue is more localized, and limited at least for the time being to the hard rock mining areas and the Boroo gold recovery plant site and downstream areas. Women and children in villages where the concentrates are being amalgamated are exposed to a serious mercury hazard. Children are handling metallic mercury without protection

¹⁷ The social violence between people, crime, drugs and prostitution, which often characterize gold rush boom-towns, are not apparent here, although these behaviors are beginning to emerge.

¹⁸ When undertaken, it is just a grading operation; soil profiles and drainage patterns have not been restored; neither seeding nor planting has followed.

¹⁹ The Zamaar goldfield and mining areas of Overhangai province have had the most problems; the softer ground in these areas has been particularly prone to collapse and failure, but there are also accidents in the hard rock area, as well as an example of a dramatic and successful rescuer of miners from an artisanal underground mine in Boroo district.

and in some cases are also involved in heating amalgam to drive off the mercury.²⁰ More mercury is used than should be necessary, as miners are unaware of the hazards associated with its use.

Box 2.1 Mercury Usage

Mercury is used by artisanal gold miners to recover free milling gold from certain types of ore. It is widely used in Latin America, frequently in hydraulic mining systems and open milling circuits, wherein each ton of ore washed down the sluice box or sent through the mill is combined with mercury, which is then discharged into the environment, or saved for reprocessing with cyanide. The mercury combines with the free gold to form an amalgam, which can be roasted to separate the mercury from the gold. This is commonly done in a plate or bowl set over an open fire. The mercury is vaporized and released to the atmosphere. The miners breathe some of it in, but most of it is methylated in the atmosphere and eventually returns to the earth and enters the food chain. Mercury contamination of river sediments and marine biota has become a major problem in the Amazon basin. A number of governments have attempted to ban its sales and use, without success. The focus of technical assistance has shifted during the past decade toward finding ways of improving gold recoveries, while limiting the use of mercury to the final concentrates, dramatically reducing the amount of mercury-contaminated tailings that need to be contained. Promoting the use of retorts to separate mercury from gold and the recovery of most of the mercury in metallic form has proved to be more difficult. Miners have been hesitant to adopt the technology, because the roasting occurs in a closed container out of their sight. Even so, with sustained efforts, progress is being made with both independent and organized miners.

2.27 From all accounts, it seems that mercury is only applied to the black sands concentrate, and not to all milled material. This reduces the amount of contaminated tailings produced, and the amount of mercury required. Additional information is required before definitive judgments can be made on the risks of exposure, the degree of contamination, and the ability to mitigate these risks.

2.28 *Child Labor.* Children involved in gold mining rarely work as independents. Most often they are working to help parents and relatives. There appears to be some differentiation in workload and type of work undertaken between age groups. Younger children (ages 8 to 15) were involved in panning, in carrying water or small amounts of the pay material to the wash site, and in the hard rock areas, in the final steps of the gold recovery process using mercury. Children above 16 are sometimes found digging tunnels and working underground; more often they sack and carry the mined material to either a washing place or a sorting site. They also break larger rocks with sledgehammers and sort the pieces by hand.

Box 2.2 Child Labor

Child labor in artisanal mining is a global concern. Important ILO initiatives to reduce and eventually eliminate child work in mines have been implemented in Bolivia, Peru, and Ecuador. The campaigns to eliminate child labor in these countries are based on a step-by-step approach. Children have come to occupy important roles in mine production system and their contribution to household economic welfare can be significant. In Peru, an ILO pilot project implemented with the mining community of Santa Filomena is testing the viability of replacing child labor

continued on next page

²⁰ The University's Population Teaching and Research Center found that almost 40 percent of children in its own sample worked with mercury. The study also discovered that many young children, especially girls, were involved in the roasting amalgam.

2.29 In the PHI study, approximately 70 percent of children surveyed were combining schooling with work in the mines on weekends or during school vacations. The rest had dropped out of school, were working full time, mainly due to the economic situations of their families. No children under the age of 8 were found working in any but the most casual of ways in the mines. The average age of the working children surveyed was 14.

2.30 The PTRC study also suggested that many parents are aware of the hazardous nature of mine work and still allow their children to work in the mines. The decision to remove children from school is often poverty driven, but other informal surveys also found that many parents working year round in the placer areas would

with technology and improved mineral processing and recovery systems. The country's new law on artisanal mining does not ban child labor, but establishes terms for compliance with the ILO Convention 138 which limits the work age to 14 years and older. A representative assembly of artisanal miners and mining associations present at the September 2002 Communities and Small-Scale Mining annual conference in Ica, Peru, presented a statement of challenges remaining for the successful formalization of artisanal miners in Peru, which included the need for a committed action plan to progressively eradicate child labor from artisanal mining.

gladly enroll their younger children in school, should income permit and schooling become available.

CONFLICT AND ITS RESOLUTION

2.31 Mongolia's artisanal gold miners are late entries into the sector, following largely on the activities of commercial miners. Mongolian artisanal miners have no rights, either legal or traditional, to land or minerals. Conflicts have emerged between informal miners and licensed commercial mining operations when there has been direct competition for access to a mineral resource or the activities of one of the parties have interfered with the others. Difficult situations have emerged in both hard rock and placer mining areas, in virgin areas, and areas already mined.

2.32 Local authorities have tried to reduce conflict by negotiating arrangements with commercial mining companies to allow artisanal mining in designated areas within leaseholds. Success has been limited, with many companies using private and public security forces to defend their interests. Consequently, conflict is controlled by a combination of accommodation and eviction, with the latter prevailing. Evictions have taken place in Boroo, but occur frequently in active placer mining areas, like Zamaar

2.33 Conflict between local authorities and informal miners has thus far been minimal, although local authorities have also used police to evict miners. The informal miners have not overtly resisted eviction and harassment, but are upset and pushing for a resolution to normalize their situation.

2.34 The government has found itself in the unenviable position of having to bring order to what in some localities had become tense land-use situations. In 2001, in an attempt to accommodate artisanal mining within the legal framework, it enacted an interim regulation that proved unworkable; it lapsed after one year and was not renewed. The government is proposing to create a legal framework for artisanal mining; it is drafting a new law it plans to finalize and enact shortly.²¹

2.35 It is not at all clear that the proposed law will adequately regulate and control artisanal mining. It will complicate, rather than simplify formalization of the artisanal miners, and force the

²¹ A summary of the proposed law is provided in Appendix XII.

development of a different kind of artisanal mining sector. By raising barriers to entry and the costs of participation, it will probably discourage new participation and raise the bar for continuing participation. It may also end up debilitating artisanal mining as an option for economic survival. In this case, families for whom artisanal mining is crucial for economic survival may end up going underground. The proposed law would then result in the creation of two classes of artisanal miners: an authorized elite and a larger group of “illegals”.

HUMAN RIGHTS

2.36 The ambiguous legal and social situation of the artisanal gold miners has permitted an environment of harassment and intimidation in the goldfields. Tactics used by company security forces against the miners have become excessive, with guards reportedly beating miners, tearing down their dwellings, and shaking down miners working outside of license areas.²² Despite the complaints of the miners, this abuse has become routine and continues unabated.

STAKEHOLDER PERSPECTIVES

2.37 *Mining companies.* Without exception, the emergence of informal mining in active licensed mining areas has complicated life and operations for mining companies, especially in the gold mining areas. The companies, which are mainly Mongolian and Russian, are not particularly sympathetic or accommodating.²³

2.38 *Government.* MRAM recognizes that artisanal mining cannot be prevented or prohibited when so few economic alternatives exist, and feels strongly that artisanal mining needs to be organized and regulated. Local authorities on the other hand see that the current situation is no longer tenable and requiring new initiatives. They are generally in agreement with the central authorities, but have their own local perspective on how artisanal mining should be organized and managed.

2.39 *Local non-mining communities.* In some places, the situation is worse than in others, and local herdsman, though resentful of the loss of pasture and water, are generally voiceless and powerless to make it stop.²⁴ In the hard rock areas most mines are worked by families from local agricultural communities, which see mining as an opportunity to ensure the continuity of their rural way of life. In-migration is of a much more limited nature, and migrants tend to be more easily integrated into existing patterns of settlement and life.

2.40 *Artisanal miners.* The few surveys that have been carried out in the artisanal mining areas suggest that the commitment of most people involved in this activity is conditional and they would happily return to their home areas if alternative livelihood possibilities existed. Attempts to migrate to the formal mining sector have had limited success, as most of the mining companies prefer to hire labor from Ulaanbaatar.

2.41 The informal miners have begun to speak openly about their situation. Many assert that they are prepared to pay taxes and get organized, and look forward to the possibility of developing

²² During the mission visit to Zamaar, this complaint was repeated time and again, especially by the women. A group of male miners at one site showed fresh bruises on their backs from a recent beating.

²³ The companies have no formal position on the *ninja* situation; they are clearly unhappy with it, and would prefer that it disappear. It is not clear to what extent the companies have been consulted on the proposed law, which would place a heavy informal burden on them to cooperate, and once committed, a legal imperative to follow through.

²⁴ This situation will be further exacerbated in areas where engineered water wells are no longer functioning and the herders are completely dependent on grazing areas sustained by natural water supply.

real communities. Or as one miner put it, “we should be legal, be given an area, and then allowed to organize ourselves.”²⁵

2.42 *Research institutes.* The Public Health Institute based on its preliminary study of mercury use and poisoning holds very strong negative opinions regarding the safety and value of artisanal mining.²⁶ It sees artisanal mining as a primitive, unsafe, and inefficient activity that should be upgraded or eliminated.

2.43 *Mongolian Mining Association.* The Mongolian Mining Association, a lobby group for the mining sector, convened a conference on artisanal mining in December 2002 attended by over 90 people representing central government, local governments, mining companies, miners, and research institutes. A number of conflicting and potentially controversial comments and recommendations came out of the forum, including the need for artisanal mining to be regulated and organized.²⁷

ARTISANAL GROWTH PROSPECTS

2.44 Artisanal mining remains the cornerstone of a popular economic survival strategy. It has generated and diversified commerce and other semi-industrial activities in the mining areas and has provided significant support to entrepreneurial development. Artisanal gold mining in placer areas can continue in its present form for 10 to 20 years before “artisanal” reserves of ore begin to decline. Some analysts, however, have suggested that the stock of materials suitable for artisanal methods is still substantial. If more people are drawn to this activity, the stock will begin to diminish, even should supply be replenished by additional exploration and expansion/upgrading of commercial operations.

2.45 Hard rock mining informal participation seems to have peaked, and the activity has not spread too far from its core area in north-central Mongolia. Undiscovered small deposits amenable to artisanal mining may still exist. However, this form of mining is technically and physically more demanding than mining in the placer areas. While its practice seems to have met the material needs of a small group of sedentary communities, this may not be replicable in other areas.

2.46 Apart from the availability of supply, the nature of mining will certainly be affected by expected government interventions in the form of new regulations, responsibilities and obligations. The government is particularly concerned that this informal activity does not jeopardize its efforts to attract foreign and domestic investment to develop and expand the commercial mining sector. Its proposed new legal framework that would reorganize and monitor the way artisanal mining is carried out, would constrain its growth, and even result in a decline in activity levels

2.47 Field estimates suggest (Annex XI) that artisanal production was around 2 tons in 2002 or 16% of official production. While it is unlikely that this will be maintained or increased, at least initially, there will be an initial period of difficulty and uncertainty, however a new legal framework for artisanal mining however it is structured and implemented. Therefore the proportion of current

²⁵ Not surprisingly, the miners prefer to be organized along family lines, and are concerned that other forms of organization not be imposed on them.

²⁶ According to PHI artisanal miners regularly violate labor law rules on safety and hygiene; children are exposed to dangerous working conditions that should be avoided even if they are contributing to the livelihood of their families; overcrowded mining camps lead to social violence and crime, outdated and dangerous technologies are used by the miners; children and women should be forbidden to work in mines where mercury is used, and that government should tighten up the mercury trade and educate people on mine safety and mercury hazards.

²⁷ Recommendations were both positive (provision of training on safety and health and environmentally responsible methods of mining and mineral processing, setting up a more effective legal buying system and a credit system for small miners), and negative (banning mercury and child labor, and suspending artisanal mining until environmental management and restoration issues are addressed).

informal activity that ends up being formalized may be considerably less than expected. The ability of the sub-sector to become a sustainable source of growth is further constrained by being geographically confined to areas that have been worked over or rejected by commercial operators. Currently, this additional production does not add value directly to the national treasury or export earnings. However it does relieve pressures to provide employment or welfare assistance. With a formalization process, depending upon how and at what rate it is undertaken, part or much of this social welfare function and burden will be transferred to the state.

2.48 Whether artisanal mining can be anything more than a transient survival strategy of a segment of the population over the short term, or have the potential to become a source of sustainable economic growth have been debated at the national level. In the recent Rural Development Strategy for Mongolia, a key theme was the need to create an “enabling environment for rural economic and social development,” that would promote the development of economic opportunities in the rural areas other than herding and large-scale agriculture. For example promoting “small-scale hand mining of gold, fluorspar and other minerals by local people,” who should be assisted in regularizing their businesses to minimize environmental degradation and conflict, access better markets, and receive better training and advice.

2.49 Artisanal mining has evolved and been adapted to meet a variety of needs. A foundation for transition exists, particularly in areas where it has become part of a sedentary community livelihood strategy and where families have decided to remain year round and establish new communities. Many of the characteristics that distinguish artisanal mining in Mongolia from other countries favors change: its lack of historic baggage, the receptivity and openness of the miners to new ideas, and their ability to adapt technological and social change. Combined with the recognition of their precarious state and an interest in moving from survival to sustainability, there is an opportunity for formal accommodation and positive change, although not necessarily the kind envisaged in the proposed law.

RECOMMENDATIONS

2.50 Approval of the proposed law should be deferred, pending a reconsideration and review of all options. This review should include additional data collection, broad consultation and formulation of an action plan.

2.51 *Additional data collection.* Information about the social and economic organization and dynamics of artisanal activity is limited.²⁸ Additional information should be collected before doing a serious assessment of options. A better understanding is needed of organizational patterns of work, and the social and economic coherence and viability of livelihood strategies that have evolved in the mining areas, including the role of the family in organizing labor and the socioeconomic roles of child labor. Further data is also needed on the evolution of non-mining commercial activity in the artisanal mining areas and social and economic links between mining centers and other urban and rural areas;

2.52 *Formulation of an action plan.* A staged approach to sector change and development should be based on the new information, using pilot projects to identify and test organizational forms and patterns to optimize social and economic value.

2.53 *Broad Based Consultation.* In Peru, with its long history of unauthorized artisanal activity, a rigorous new law was only drafted after the miners and other affected stakeholders were brought into an intensive and constructive consultation process.

²⁸ Some of this information may have been collected as part of a Canadian sponsored study of artisanal mining in Mongolia, carried out by the Mongolia Business Development Agency.

2.54 Enhance environmental protection and rehabilitation. In the absence of defined legal responsibilities for environmental management, commercial miners on whose properties the informal miners currently work should be encouraged to provide some basic technical assistance to ensure the use of more benign mining practices, site remediation and environmental management. Especially since the ultimate legal responsibility for site remediation still lies with the commercial miners. Any new law related to artisanal mining should include appropriate and enforceable procedures and regulations relating to environmental management and more responsible mining practices.

2.55 Eliminate the use of Child Labor. The use of child labor should be progressively eliminated from the mines, with a more immediate emphasis on removing the youngest children from exposure to hazardous work situations. In any case, efforts should be made to remove children, who are the most vulnerable to mercury's debilitating effects, from any work that involves the handling of mercury or amalgam

2.56 Mercury use should not be banned. Rather an educational program and a demonstration project to introduce changes in mercury handling should be designed and implemented with the mining communities in the hard rock areas. Simple measures may dramatically reduce the exposure hazard, e.g. use of retorts or closed ovens vented to the outside of dwellings or work areas.

2.57 The Mine Rescue Service should be better supported. This service could become the key institutional lever for improving health and safety in the field. Given its legal mandate and current focus on artisanal mining, the rescue service should be better funded to enable it to intervene more effectively with artisanal miners on hazard awareness, mine safety, accident prevention, first aid and mine rescue training. This task is all the more timely insofar as most of the gold miners have no experience or training in mining and many of the summer migrants to the mines are newcomers.

2.58 Assess Institutional Needs. An institutional needs assessment should be undertaken across central and local agencies to identify resources and competencies needed to design and implement policies, laws, and regulations for artisanal mining and recommend measures for ameliorating deficiencies.



FISCAL AND REVENUE MANAGEMENT OF THE MINING SECTOR

CHAPTER 3

MONGOLIA'S TAX SYSTEM

3.1 Mongolia needs internationally competitive tax laws to compete for foreign investment in its mining sector. Most of Mongolia's important tax laws were introduced in 1993 and 1997. There are 23 different taxes imposed on legal entities and individuals (Table 3.1).

Table 3.1 Summary of Tax Collections
(Tg billions)

	All Industries					Minerals Sector	
	1997	1998	1999	2000	2001	2001	% of industry taxes
VAT	38	46	60	76	104	3	3
Social security	21	26	30	39	54	6	11
Excise tax	20	24	27	41	53	-	-
Corporate income tax	55	31	26	48	44	15	34
Customs duties	9	2	9	22	27	-	-
Personal income tax	8	10	13	15	21	2	10
Land fees	1	2	2	3	5	1	20
Royalties	4	3	3	3	4	1	25
Vehicle tax	1	2	3	3	3	-	-
Other taxes (16 taxes)	6	8	8	11	13	-	-
Total	163	154	181	261	328	28	9

Source: Ministry of Finance and Economy

The principal taxes that apply to the mining sector include:

3.2 **Corporate Income Tax.** Corporate income tax under the 1997 Economic Entity and Organization Income Tax Law (EEOITL) is imposed at 15 percent on the first Tg 100 million of taxable income, and 40 percent thereafter. Certain kinds of income are subject to lower rates: income from bank interest is taxed at 15 percent, and income from disposal of immovable property at 2 percent.

3.3 The law provides a number of tax incentives; these include granting mining enterprises that have foreign investors a three-year tax exemption, and 50 percent tax relief for the subsequent three-year period, and allowing foreign shareholder who re-invest dividends in Mongolian companies to reduce their taxable income by the amount of the dividends.

3.4 Payments to non-residents of Mongolia are generally subject to 20 percent withholding tax although this rate can be reduced by tax treaties. As of January 1, 2002, Mongolia was party to 24 international tax treaties, and had initiated 7 others.

3.5 Mongolia's Minerals Law directs the Ministry of Finance to implement regulations to determine the taxable income of mining enterprises, including amortization of exploration and development expenditures, depreciation of fixed assets, a three-year loss carry forward provision, and rules relating to the deduction of infrastructure costs. These regulations have not yet been implemented and could have significant impact on investment decisions and mineral sector development;

3.6 **Personal Income Tax.** Personal income tax is based on the principles of residency and worldwide income. A Mongolian resident - defined as someone present in Mongolia for more than 183 days a year - is subject to personal income tax on worldwide income. Taxes begin at 10

percent (for taxable income up to Tg 2,400,000), and rise to 20 percent (Tg 2,400,001 to Tg 4,800,000), and 40 percent thereafter. Personal income taxes on salary and wages are withheld by employers and remitted monthly to the government;

3.7 *Mineral Royalties.* Under the Minerals Law royalties are set at 7.5 percent on the gross sales value of placer gold, and 2.5 percent on all other minerals. Although not specifically mentioned in the corporate income tax law, according to a senior official of the General Department of National Taxation (GDNT) the mineral royalty paid by a taxpayer is deductible for the purposes of computing taxable income;

3.8 *Value-Added Tax.* A VAT replaced the sales tax in 1998. Mongolia's VAT law incorporates the main principles of modern VAT legislation. The purchase and importation of most goods and services are subject to 15 percent VAT. The export of all goods is zero-rated, so that a mining enterprise that exports its product will be constantly in a refund position with respect to VAT paid on its purchases of goods and services.

3.9 The GDNT has proposed an amendment to the VAT law that would preclude VAT refunds to non-producing companies. This would deny VAT refunds to companies during the exploration and development phases, increasing the cost of doing business in Mongolia. It is not known whether VAT paid during these phases of mine life would be recoverable once production starts.²⁹

3.10 Importation of heavy equipment for major exporters and selected priority industries can be exempted from VAT and customs duties under a Joint Order of the Minister of Finance and Economy and the Minister of Trade and Industry. The mining sector qualifies for this important exemption. Experience with this amendment has been less than favorable, as the list of eligible equipment does not include drilling equipment, and there is some dispute as to whether the exemption applies to equipment imported by a mining enterprise's contractors.

3.11 In January 2002 gold sales became exempt from taxation,³⁰ so that gold producers are not entitled to VAT refunds, but must bear the burden of VAT paid on purchase of goods and services, unless those purchases are exempt under the joint order. This can put Mongolian gold producers at a competitive disadvantage as compared to similar operations in other countries.³¹

3.12 *Customs Duties.* Mongolia imposes a 5 percent duty on most imports, subject to the heavy equipment exemption;³²

3.13 *Excise Tax.* Excise tax is imposed on passenger vehicles, alcohol and tobacco products, gasoline, and diesel. Gasoline is subject to excise tax at the rate of US\$11/ton (< 90 octane) or US\$12/ton (> 89 octane). Excise tax is payable on diesel fuel at the rate of US\$15/ton; and finally

3.14 *Social Insurance Payments.* Mongolia's social insurance program is administered by the Ministry of Labor and Social Care, and imposes aggregate payroll taxes of between 19 to 21 percent on employers and 10 percent on workers.

²⁹ Under other countries' VAT laws, VAT paid prior to registration is not refundable.

³⁰ From 1999 through 2001, Mongolia imposed a 10 percent export tax on gold. When this levy was repealed under pressure from the industry and other interested parties, the government, to maintain tax neutrality, amended the VAT law on gold sales to compensate for the loss of revenues previously derived from the export tax.

³¹ Only Indonesia and Vietnam exempt gold sales from VAT, producers in other countries receive credit for VAT paid on their purchases of goods and services.

³² Two Russian-owned mining companies are exempt from import duties under a 1991 bilateral agreement.

INTERNATIONAL COMPETITIVENESS

3.15 Mongolia is competing with Asian and other countries to attract investment to the capital-intensive mining sector. It is important that its tax regime be internationally competitive by embracing best practices. In assessing the international competitiveness of Mongolia's tax regime, it is helpful to undertake both qualitative and quantitative analysis of the tax regime.

3.16 **Objectives of a Mineral Taxation Regime.** An internationally competitive mineral taxation regime should encourage the profitable exploitation of as many deposits as possible by recognizing its specific characteristics, provide for a fair participation by the state in the fruits of mining enterprises, be stable over time, be transparent and provide a level playing field for all players, and be easy to understand and administer.³³

3.17 **Specific Characteristics of the Mining Sector.** The mining tax regime should recognise the unique characteristics of the mining industry, including its relatively high risk, capital intensive and cyclical nature, its remote location and finite life, and significant restoration obligations. A tax regime can recognize these factors by permitting the mining companies to reap rewards commensurate with the risks inherent in these types of investments. The type and level of taxes that are imposed on mining enterprises have a direct bearing on their rate of return on capital. As a general rule of thumb, the minimum return on investment sought by mining project investors is 15 to 18 percent, depending on country risk and other factors.

3.18 Mining investors should also be able to rely on the certainty and stability of tax rules. Tax stability agreements can reduce perceived risks, which reduce financing costs and makes projects more economically viable. Tax stabilization mechanisms are particularly helpful for countries, such as Mongolia, that do not have track records of legislative stability. This mechanism, however, is still relatively new to Mongolia, and government should take care to ensure that: the agreements do not preclude upside participation when projects exceed expectations; the process is transparent; and tax inspectors and other government officials are aware of the existence and relevance of stability agreements, and honor fully their provisions.

3.19 To date, three mining companies have entered into Stability Agreements. The term of the Agreement is ten years in the case of an investment greater than US\$2 million, and fifteen years where the investment exceeds US\$20 million. A standard stability agreement will avoid time consuming negotiation and the risk that the government may stabilize an arrangement that later proves too generous. A mining licensee is not obliged to enter into a Stability Agreement. There is at least one important producer that has declined to enter into a Stability Agreement, because it did not want to be locked into existing tax rates.

3.20 It is strongly recommended that the conditions of these agreements are consistent for all companies, and that government be very careful not to agree to concessions that are out of line with good practice, especially for large mine with 20 to 30 years of production or more. It is vital for government to use expert advice in any such negotiations and that all proposed stability agreements be approved by cabinet before they are finalized.

³³ The mining tax regimes that are summarized in Annex IX reflect a number of best practices in the context of mineral taxation policy: these practices can serve as benchmarks for assessing the international competitiveness of Mongolia's tax regime.

Box 3.1 Stability Agreement Coverage

The coverage of stability agreements varies among countries. A stability agreement can freeze tax rates, but not the basis for taxation. For example, Mongolia's standard stability agreement appears to fix the corporate income tax rate at 40 percent, but does not hold constant the rules for determining taxable income.

Firms generally prefer schemes that freeze both the tax rates and the basis for taxation, and protect a firm from new taxes introduced after it enters into a stability agreement, as they have an interest in preventing their tax burdens from increasing as a result of future legal changes.

Some schemes allow firms to avail themselves of beneficial tax changes that occur subsequent to the effective date of their agreements on the basis that beneficial tax changes may be necessary to keep a country's tax regime internationally competitive, and that firms with stability agreements may need to benefit from such changes to remain competitive.

Arguments against such schemes include the fact that investment decisions to bring a mine into production are based on tax regimes already fixed by stability agreements, thus a further favourable change could be viewed as an unnecessary windfall, and the concept that being denied the benefits of future favorable tax changes is part of the price paid by firms for the benefits of the stability agreement.

3.21 It is strongly recommended that the conditions of these agreements are consistent for all companies, and that government be very careful not to agree to concessions that are out of line with good practice, especially for large mine with 20 to 30 years of production or more. It is vital for government to use expert advice in any such negotiations and that all proposed stability agreements be approved by cabinet before they are finalized.

3.22 Mongolia's six-year tax exempt period and relatively generous depreciation rates for machinery and equipment in the corporate tax system help to keep the level of corporate income taxes low in the early years of project life, and thereby serve investor's needs in terms of payback. However, the current global trend is away from tax holidays and toward the adoption of accelerated depreciation, and lower tax rates to generate cash flow in the early years of production and avoid sub optimal operational practices such as "high grading".

3.23 A mining tax regime should attempt to minimize the imposition of customs duties, VAT, and similar up-front costs that are a function of capital investment. A 15 percent VAT and 5 percent customs duty on the importation of capital equipment can, in effect, add up to 20 percent to the cost of a project, and render it uneconomic. Mongolia has exempted VAT and customs duties on the importation of heavy equipment. However, this benefit is somewhat diminished by a provision in the VAT law that precludes VAT refunds on other purchases of goods and services.

3.24 The prices of most mineral products are established by the interaction of supply and demand in the global marketplace. Mining enterprises are price takers that do not set the price for their products. A mining tax regime will be relatively attractive if it minimizes taxes that are not based on profits. Because mining enterprises are price takers, the cost of such taxes cannot be passed on to customers. This burden can have a notably adverse impact on the economics of a project, its cash flow, and its ability to access credit markets.

Box 3.2 Tax Exemptions

Over the years, several countries have included exempt periods in their mining tax legislation.

Such exempt periods can compensate for relatively high tax rates^{3/4}such as Mongolia's 40 percent corporate income tax rate^{3/4}and send a strong signal to the investment community that a host country is pro-mining.

An exempt period can, however, have serious drawbacks. A mining company may be encouraged to "high grade" its operations by mining its high grade ore during the exempt period, so as to maximize the amount of profit realized during the exempt period instead of during taxable periods. The existence of exempt periods complicates the administration of, and compliance with, tax laws. Taxpayers are known to take aggressive tax filing positions to maximize taxable profits during the exempt period.

A tax regime that provides for a relatively high tax rate, together with an exempt period, is sometimes referred to as a 'take-it-away, give-it-back' regime. The current global trend in tax policy is away from such regimes, and toward tax regimes that are simpler and have lower tax rates.

3.25 Mongolia's 7.5 percent royalty on placer miners is very high by international standards (see Appendix III); it is not a function of profit, and cannot be passed on to customers.

3.26 Most metal prices show wide swings over the years, and the typical mining enterprise's profits will reflect, and depending on its capital structure, accentuate these price cycles. It is common for even the largest mining companies to record losses for during cyclical troughs in metal prices. The mining tax regime can recognize the cyclicity of the industry by providing loss carryover periods in the income tax system, and possibly the mineral royalty system. The absence of a loss carryover provision in the corporate income tax law means that the government collects income taxes in the good years when high metal prices generate substantial profits, but provides no relief from income tax in years when low metal prices cause losses.

3.27 Mongolia's corporate income tax law does not provide for the carryover of tax losses, and is not internationally competitive in this respect.

Box 3.3 The Chilean Model

While Chile is often cited as a model regulatory regime due to its attractive tax regime and successful mining sector, it is questionable whether the Chilean model is appropriate for other countries. For example, Chile does not collect a mineral royalty from mining operations. Mineral royalties could be strategically important for Mongolia^{3/4}for example, to provide a relatively fast source of revenues to the central and/or provincial governments and their communities. Similarly, Chile's 15 percent corporate income tax rate is not appropriate for a country, such as Mongolia, which has few choices in developing sources of growth. When Chile adopted its current attractive tax regime, unique circumstances prevailed. The existence of some of Chile's massive ore bodies was already well known, but Chile needed to do something dramatic to attract foreign investment following earlier state appropriations of foreign-owned mines. In addition, Chile derived tax revenues from other sectors, and was not heavily dependent on the mining sector as a source of growth. Further, the attractiveness of Chile's tax regime was partially offset by complicated and stringent foreign exchange controls. In summary, Chile's tax regime will not necessarily work in other countries.

3.28 Ore bodies are usually found in remote locations, so that mining projects involve substantial infrastructure costs. In the past, mining enterprises were often expected to pay for access roads, electric power facilities, port facilities, and social infrastructure such as medical clinics, school, and recreation facilities. However, the current trend is for investors to resist these expectations. A mining tax regime can recognize these higher costs by providing generous tax depreciation rates for infrastructure costs. Canada, for example, allows infrastructure costs that are incurred during pre-production to be depreciated for tax purposes at a 100 percent. It is not clear in Mongolia's corporate income tax law how such costs are to be depreciated.

3.29 Whether a country seeks to build stability into its mining tax regime through legislation or contract, the important consideration is that the country honors its commitment to stability. Unless the country has a proven track record, mining enterprises will view promises of stability with suspicion and, once the country has established a track record of stability, it should be careful to preserve that record at all costs. Mongolia has changed its tax laws frequently over the past several years. Such changes can damage its reputation for tax stability.

3.30 The mining sector has significant restoration and reclamation obligations, and there is a trend to charge enterprises with stricter responsibilities for environmental externalities, site restoration and reclamation, and ultimately mine closure. The modern mining tax regime recognizes these increasing responsibilities by providing tax relief when funds are deployed, set aside or otherwise reserved during the production stage for reclamation, restoration, and mine closure. Few mining tax regimes adequately address this issue, and Mongolia's tax law does not address it, even though Article 29 of the Minerals Law prescribes comprehensive requirements to ensure that licensees fulfill their environmental obligations, including making deposits to special bank accounts.

3.31 **Global Comparisons.** To assess Mongolia's tax regime and quantify its impact on mining investment, the development of a hypothetical large-scale base metal mine was simulated in a number of competing countries, the results of which are set out in Annexes V and X. While Mongolia's tax regime appears generally to be internationally competitive from this analysis, its components are delicately balanced. For example, the six-year exempt period that can apply to the mining sector must be balanced against the relatively high corporate income tax rate (40 percent).

3.32 Table 3.2 shows the investment return (IRR) on a hypothetical, large-scale base metal mine developed in five different countries. The hypothetical mine used in this model is typical of the kind of mine that could be found in any of these countries.³⁴ The model holds revenues and costs constant for each country, so that the only variable is the country's tax regime. Accordingly, the IRR is a good indicator of the relative impact of each country's tax regime on a project's IRR.

3.33 The IRR in Chile is highest because it does not impose a mineral royalty, whereas the other four countries in the table charge mining operations with mineral royalties. And also its corporate income tax rate is only 15 percent. In analyses of this nature, Chile is consistently the most attractive country from a tax perspective, and consequently has been particularly successful in attracting investment, developing its mineral resources, and achieving above average growth. Indonesia's IRR is lowest, mainly because its royalty is based on the volume of production, and therefore is not sensitive to metal price or costs and expenses.

³⁴ These were selected for comparison because: Chile is generally cited as the best model for the modern development of a successful mining sector; Canada has a mature and successful mining sector that is based on laws, which reflect many decades of experience; and Indonesia and PNG are two Asia Pacific countries with excellent geology that are competing with Mongolia to attract investment.

3.34 Based on these modeling results, Mongolia's tax regime is competitive with the regimes in PNG and Canada. The model assumes, however, that the project is eligible for Mongolia's six-year³⁵ income tax exemption. If the six-year exemption were not available, the IRR would be a non-competitive 12.29 percent instead of a competitive 17.18 percent. In the absence of the six-year exemption, a reduction in the corporate income tax rate from 40 percent to 20 percent would be required to restore Mongolia's tax regime to international competitiveness. Similarly, if the six-year exemption were not available, a 25 percent corporate income tax rate and a 1.5 percent royalty (instead of 2.5 percent) would maintain the competitiveness of the regime. This indicates that the six-year exemption is required to offset Mongolia's relatively high 40 percent corporate income tax rate and 2.5 percent royalty. This point also serves to illustrate that Mongolia's tax regime is very delicately balanced, and a change cannot be made to one component of the regime without modifying another component or other components, if international competitiveness is to be maintained.

Table 3.2 Large-Scale Base Metal Mine

Country	IRR (%)	Government Share (%)
Chile	18.3	16.7
Mongolia	17.2	32.8
Papua New Guinea	16.9	38.6
Canada (Ontario)	16.4	41.7
Indonesia	15.00	39.7

Source: World Bank team estimates

3.35 The government share in Table 3.2 shows the amount of taxes collected by the government as a percent of pre-tax cash flow generated by the project i.e. the effective tax rate. When formulating tax policy, a government must be careful not to stray too far from international norms with respect to government share. Although Canada's government share is relatively high, a substantial portion of Canadian taxes are collected in the latter part of mine life, due to 100 percent tax depreciation allowances and royalty exemptions during the first three years of production. Thus, the IRR of a mine in Canada is not as heavily impacted by the higher tax rates in that country.

3.36 Mongolia has identified mining as a priority industry for contributing to future growth in the economy and in tax revenues. In 2001, the mining sector accounted for approximately 9 percent of tax revenues. Three large mining companies confined to three minerals, gold copper and molybdenum, accounted for 95 percent of taxes paid by the mining sector in 2001.

3.37 The experience in many mining communities around the world is that there is often a gap between the community's expectations of a mining enterprise, and the enterprise's capacity to deliver those expectations. Often, the community sees a great deal of economic activity during the exploration and development phases of a project, without realizing that it will be many years before the project starts to generate significant tax revenues that benefit the country and the community. Further, as confirmed by the fact that only three mining companies in Mongolia pay 95 percent of all taxes paid by the sector, it is mostly medium- to large-scale mines that generate significant tax revenues.

³⁵ Three-year exemption from corporate income tax, plus 50 percent reduction for the next three years.

Box 3.4 Revenue Management Examples

Canada has a long mining tradition and is an example of a country where mineral royalties are paid to provincial governments. This has contributed to a situation where Canada has three 'have' provinces and seven 'have-not' provinces. The income and wealth disparity among the provinces is addressed by a system whereby the central government makes transfer payments to the 'have-not' provinces based on a complex formula that takes into account each province's tax base, per capita income, and similar factors. Until 1999 mineral royalties in Indonesia were paid to the central government. Starting in 2000, mineral royalties were to be shared by the central government and the provinces according to apparently arbitrary percentages that were set out in new legislation, as part of the country's decentralization program. It is widely acknowledged that the poor implementation of this program and its mineral royalty component is one of the main reasons that there has been no material new investment in the country's mining sector since 1999. To quell the demands of some provinces for political autonomy or independence, the central government rushed into a decentralization program without proper planning. In particular, the central government did not consult the provinces or other interested parties in devising the plan. Disputes between the different levels of government have ensued, and the plan for decentralization has not been implemented, leaving the mining sector confused as to what laws apply.

3.38 Typically, it can take at least three years to finance and develop a large-scale mine following the completion of exploration and a bankable feasibility study. It is the norm, then, for governments not to collect corporate income taxes until six or seven years after the start of mine development. On the other hand, royalties that are a function of production, as compared to profit-based royalties, generate revenues for the government starting with the commencement of production. It is important that the central and local governments, and communities, recognize this feature of the mining sector when planning for economic growth and community development. Timing issues aside, the mining sector can make an important contribution to Mongolia's tax revenues. A large mine can generate significant corporate income tax revenues and royalties over its life.

3.39 *Constraints to new investment and mineral development.* Based on a review of Mongolia's tax system as it applies to the mining sector, and international best practices, it is recommended that government address the following potential constraints to medium to long-term growth in tax revenues from the mining sector:

3.40 *The 7.5 percent royalty that applies to placer mining is not internationally competitive.* Mongolia's mineral tax regime would be improved if this royalty were reduced to 2.5 percent, the rate imposed on all other mineral production.

3.41 *Gold sales are exempt from VAT.* As a result, gold producers are not entitled to VAT refunds and must therefore bear the burden of the VAT they pay on their purchases of goods and services. Consequently, gold producer capital costs and operating expenses can be up to 15 percent higher than they would be if they were operating in competing countries. Mongolia's tax system would be improved if the government repealed this rule, which runs contrary to international norms.

3.42 *The government has proposed an amendment to limit VAT refunds to producing companies.* This means that companies in the exploration and development phases would not be entitled to VAT refunds. This would increase the cost of exploring and mining in Mongolia, and present a barrier to investment in the sector. It would also be inconsistent with international best practices: the VAT laws of other countries allow non-producers to register for VAT purposes.

3.43 *All taxes are now paid to the central government.* It is important that local communities affected by mining operations see that they benefit directly from such operations. A preferred way to achieve this is to have at least a portion of mineral royalties paid directly to local governments.

3.44 *Stability agreements play an important role in Mongolia's mining sector.* The government must be mindful that, based on the experience of other countries, stability agreements can be counterproductive if they are not handled in a transparent and consistent manner, and in accordance with clear guidelines. Also, the importance and relevance of stability agreements should be promoted among tax officials and their staff, and suppliers to the mining sector, to ensure that these agreements are honored in the course of tax audits, collections, and withholding.

3.45 To plan and monitor a competitive fiscal regulatory environment for the mining sector, the government needs statistical information about the taxes paid by the mining sector and sub-sectors. At present, information on tax collections from the mining sector is difficult to obtain and is unreliable.

Investor confidence in the administration of the tax system would be improved if some changes were made to tax provisions. The corporate income tax law should include a loss carryover provision consistent with international best practices and should prescribe the tax treatment of exploration and development expenditures. These expenditures can be substantial, but the current law does not address the tax deductibility of these expenditures. The corporate income tax law should also address tax treatment of mine reclamation and closure costs and confirm the deductibility of mineral royalties in determining taxable income.

REVENUE MANAGEMENT

3.46 The 2002 Public Sector Management and Finance Act (PSMFA) provides for a highly centralized system of tax collection and expenditure. Virtually all taxes are remitted to the central government and used to fund central and local government budgets.

3.47 **Revenue sharing.** Mineral royalties are paid to the central government, and become part of this general revenue account. In some countries (e.g., Canada) mineral royalties are shared with local governments.

3.48 **Adjusting to boom or bust cycles.** Commodities prices, and metals prices, in particular, are subject to boom and bust cycles that can be transferred to the economy; this risk is greater for mineral-dependent economies such as Mongolia where 60 percent of 1999 exports were ore and metals. In 1996-97, for example, export prices for Mongolia's main commodities fell sharply, accentuating inadequacies in public expenditure management.

3.49 The main implication of such price shocks is that price stabilization mechanisms and compensatory financing are likely to be ineffective. The best policy response to these shocks would be to adjust the economy to the new price level. The key issue becomes, therefore, how to adjust the economy to minimize any negative impact or optimize any positive impact on the economy's long-term growth. Policies or programs that lead to fiscal unsustainability, unproductive investments, rent seeking behavior and Dutch disease effects should be avoided. (Box 3.5).

Box 3.5 Revenue Management in Botswana and Trinidad and Tobago

Botswana's diamond boom, which began in 1965, was due to the discovery and development of large amounts of high quality diamonds, not a price increase, and led to 1966-89 annual GDP growth of 8.5 percent, the highest in the world. The reasons for Botswana's successful management of the diamond boom are not difficult to find. A large part of the windfall was put in foreign savings and only used when the absorptive capacity of the economy was deemed sufficient. Government spending policy paid close attention to the availability of skilled manpower, and the recurrent costs of development spending in relation to revenue forecasts. Close attention was paid to the foreign exchange rate to manage inflationary pressures, and the government avoided investment-spending sprees. When diamond revenues fell dramatically in 1981-82 due to a drop in prices domestic credit growth was cut dramatically, interest rates raised, wages and salaries frozen, and the pula devalued by 10 percent.

Unlike Botswana, Trinidad and Tobago used its oil windfall to fund an import substitution strategy, and in 1975 began a plan of gas-based industrialization. Shortly after, the government began to use part of the windfall to acquire a large number of declining industries. Public pressure to share the benefits of the boom led to large consumer subsidies for food, fuel, and utilities equivalent to five percent of GDP. The political difficulty in cutting back on these subsidies was an important element in the economic collapse of Trinidad and Tobago in the 1980s, when annual GDP growth was 2.5 percent.

3.50 Mongolia is vulnerable to unproductive investments and rent-seeking behavior, which could lead to in fiscal unsustainability in the long term. Negative shocks can also lead to distributional conflicts if adjustment to lower levels of income deepens societal divisions. Usually this leads to political pressures to delay fiscal and key macro prices adjustments such as raising interest rates or reducing real wages, which can affect productivity and growth significantly.³⁶

3.51 **Enhancing governance and transparency at regional and local levels.** Three components are essential to manage mining revenues at the regional and local levels effectively. First, a partnership approach that clearly defines the roles of governments, communities and companies. Second, meaningful local consultation is necessary for the process to deliver sustainable development. Third, there is a need to decentralize some part of mining revenues.

3.52 The fiscal relationship between the central and *aimag* governments in Mongolia is affected by difficulties in establishing the appropriate role and size of local governments in service delivery, weak accountability structures, inappropriate matching of expenditure responsibilities with revenues; poorly designed transfer systems, and a lack of incentives for local governments to raise their own revenues. Thus, any decentralization process in Mongolia must emphasize

Box 3.6 Mongolia: Weaknesses in Public Finances

In the past few years' public sector fiscal and policy discipline has seriously declined in Mongolia. As GDP growth rates dropped during the second half of the 1990s the government increased public employment and cash transfers and bailed out failing public enterprises. The government has tolerated arrears buildups and has honored SOE foreign debt obligations, without a systematic process in to identify and record government liabilities arising from SOE activities. Moreover, there are loopholes in the system that could lead to budget leakages undermining fiscal sustainability. For example, proposals do not have to compete with each other for funding because after budget approval new proposals can be funded. Consequently, the budget lacks comprehensiveness and weak accountability impairs fiscal effectiveness.

Source: Based on PERMR report (2003)

³⁶ For example, Latin American countries, with the exception of Chile, suffered badly during the 1980s due to this type of conflicts while trying to adjust to the debt crisis and negative shocks in commodity prices.

matching greater and predictable resources at provincial level with accountability and responsibility for managing those resources.

3.53 Ensuring sustainable development beyond mine closure. All mines eventually close as ore deposits run out, with significant impact on local communities. To contribute to development sustainable after mine closure, part of the mining benefits—including revenues—should become renewable wealth by being used to increase social and human capital. Another way of promoting long-term sustainability is including within the community or regional development plan resources to promote non-mining businesses to diversify the local economy³⁷. An alternative is a fund invested in assets that earn income to ameliorate the economic impact of closure. Recurrent costs for infrastructure maintenance and education and health services could be financed with the income earned by trust funds.

Box 3.7 The Community Development Forum

In a meeting sponsored by the Mining, Minerals and Sustainable Development (MMSD) project in 2001, a group of specialists and mining stakeholder representatives proposed a “Community Development Forum” partnership between stakeholders at project level that would involve anyone with a stake in mines, place mining in the broader context of regional development, and foster commitment to the process by all parties.

The roles of the forum participants were given as follows: The community should own the process. The government should establish a requirement for the forum in the regulatory framework and assist companies to develop common approaches. The forum should not necessarily be funded by companies, but through trust funds at a national level. This would mean diverting some of the government’s mining revenues back to the community area. Finally, a national framework of expectation would provide companies a level playing field.

Source: Based on MMSD Wealth workshop report, (2002)

3.54 Policy Considerations. Thus, there are three main areas of policy to be considered to make the mining sector an engine of growth for Mongolia: macroeconomic policies, policies for institutional building and strengthening, and regional and local development policies.

3.55 The main thrust of macroeconomic management should be to prevent spending sprees in response to significant expansions of mining revenues during boom years. Allowing the public and financial sectors to invest in foreign financial assets can help offset the economy’s absorptive constraints. This policy would moderate wide fluctuations in the balance of payments and wide swings in private expenditures. The need for prudent and conservative fiscal policy cannot be overemphasized. Because of the great variability and long life of metals price shocks, it is neither advisable nor efficient to use stabilization funds and compensatory financing to deal with boom-bust cycles. Unless there is great confidence that the shock will be transitory, adjusting the economy to the new price level is generally the right decision. If the shock is positive, a modest appreciation of the real exchange rate should not be a problem and may reflect low-cost productivity gains in the economy.

3.56 Finding an effective formula for sharing mining revenues with local and regional governments is a priority for Mongolia. The adjustments proposed in the PFMR to clarify priorities and

³⁷ This should be approached with caution, as it can also lead to squandering mining wealth. Christmann, P. and N., Stolojan. (2002) reported that 20 to 25 percent of compensation payments from the Porgera mine in Papua New Guinea went into business, developments most of which quickly failed. Loayza, F. et al (2001) found that in the Inti Raymi foundation in Bolivia the least effective programs were those devoted to promote non-mine production activities. This should be approached with caution, as it can also lead to squandering mining wealth. Christmann, P. and N., Stolojan. (2002) reported that 20 to 25 percent of compensation payments from the Porgera mine in Papua New Guinea went into business, developments most of which quickly failed. Loayza, F. et al (2001) found that in the Inti Raymi foundation in Bolivia the least effective programs were those devoted to promote non-mine production activities.

responsibilities through the central budget and reform the arrangements between central and regional governments are badly needed. Within this framework, which is compatible with the decentralization of mining revenues, the Mongolian government could explore the possibility of allocating mining royalties directly to aimags, which has worked well in Bolivia.

3.57 To improve management of booms and avoid or minimize the long-term costs of busts, enhancing institutions of conflict management should also be contemplated. In mining regions such as Orhon, where the largest Mongolian SOE—Edernet—is located, a regional mining forum could be established to involve all mining stakeholders in discussing how mining can best contribute to regional development. To enhance transparency and accountability of government management of mining revenues and prevent rent-seeking behavior and corruption, civil society entities can be encouraged to serve as ombudsmen or watchdogs by publicizing examples of wrongdoing to raise the political costs of mismanagement. Perhaps most importantly, an independent and strong media can significantly increase the political costs of mismanagement and corruption and the likelihood that those behaviors will be punished.

3.58 A comprehensive framework for compensation and benefit sharing that leads to a concerted community development plan is critical in managing mining revenues for local community development. This framework should establish the regulations for community compensation and process that will lead to community development plans, including community consultation. The regulation of the process leading to the community development plan should be flexible enough to accommodate itself to the specificity of each mining project.

Box 3.8 The Alaska Permanent Fund

The Alaska Permanent Fund originated largely out of frustration and disappointment with excessive and wasteful government expenditures on infrastructure and subsidies to enterprises financed by government hydrocarbon revenues that were supposed to diversify the economic base of the Alaskan economy. The Fund holds financial assets and real estate for the purpose of earning income and benefiting from capital gains. Investments are not made for social or development reasons; there are other government agencies and mechanisms to pursue these objectives. With 50 percent royalty revenues, the Fund seeks to earn a consistent real rate of return of 4 percent per year with investments of below-average risk. The remaining hydrocarbon revenues are deposited into the state's general fund.

The Permanent Fund consists of two parts: principal and income. Between 1976 and 2001, the principal grew in value to about US\$25 billion. Cumulative net income exceeded US\$20 billion. The principal is invested in a variety of assets within and outside the American economy. Only about 1 percent of the principal is invested in Alaskan assets.

Income has been used in three ways. First, to make dividend payments to individuals; in 2000, each Alaskan received a dividend check for US\$1,964. Second, income is used to inflation-proof the Fund by re-inserting income into the principal; otherwise, inflation would reduce the real value of the principal. Third, income is used to increase the size of the principal. Since 1976, 42 percent of the income has been paid out to individuals as dividends, with the remaining 58 percent being re-inserted in the principal in the form of inflation proofing or re-investment.

Particularly noteworthy is the way that the Alaska Permanent Fund is managed and governed. It is managed at arm's length from the government by the Alaska Permanent Fund Corporation. The Corporation is overseen by a board of trustees consisting of four public members, the Alaska Commissioner of Revenue, and a cabinet minister chosen by the Alaska governor. Thus, the Fund is managed at a distance from government and the pressing political issues of the day. Given that Alaska citizens receive an annual dividend, and that they had to approve a constitutional amendment to create the Fund, citizens have developed and retained a strong interest in the Fund, its management, and its financial performance. The Fund has strong support of the Alaska voters.

Source: Based on Eggert, R. (2002)

3.59 Once the institutional framework for promoting community development is defined, the effectiveness of the use of mining revenues depends on compensation and benefit sharing policies. Compensation will be effective if facilitating the transition of communities to a sustainable new way of life is properly addressed. This calls for training, employment, and spin-off business opportunities, and for policies to avoid the increase of inequalities within the community. Benefit sharing will be effective if the accumulation of human and social capital is promoted. In addition, establishing a trust fund to cover the recurrent costs of human and social capital accumulation and maintain infrastructure in the local area after mine closure is suggested.



*THE LEGAL, REGULATORY,
AND INSTITUTIONAL
FRAMEWORK*

CHAPTER 4

INTRODUCTION

4.1 Over the past 15 years mining nations have had to recognize and seriously address new global mineral policy imperatives. There has been increased global competition for foreign direct investment in mineral exploration and development projects, and increased pressure to meet new national and international social and environmental sustainability standards. Regional, local, and traditional communities have demanded more involvement in national decision making that directly affects them, and a much greater share of revenues generated from activities in their jurisdictions. There have also been pressures for improved transparency, accountability, and public and corporate governance.

4.2 Mining jurisdictions have had to revise mining legislation and regulatory and implementing institutions to meet these challenges. Improving mineral sector management structures requires a delicate balancing of internationally competitive investment provisions with nationally credible social and environmental rules of conduct. As a result of this legal and institutional evolution, certain fundamental principles have emerged as international best practices for successful mining nations. They represent an integration of well established practices from the historically most successful nations—Australia, Canada, and the United States—with much improved practices incorporated into government and industry rules of conduct that reflect society's demands for long-term commitment to social and environmental sustainable development. New mining nations are emerging under this new paradigm. In Latin America, Chile, Peru, and Mexico now attract more risk capital for mining ventures than Canada or the United States. In Africa Botswana, Burkina Faso, Madagascar, Tanzania and Mozambique have adopted successful reform practices. In Asia, Mongolia has been the only nation to adopt such reforms.

4.3 There is an international legal and practical consensus on the fundamental principles a modern mining law should exhibit. These include transparency and fairness, clarity, non-discretionary mineral license administration, conclusive decision making within specific time frames, non-discrimination, uniform standards and administrative procedures, lead agency coordinating authority, and coordination with other legislation and regulatory authorities.

4.4 The last principle continues to be the most difficult to implement. It remains an area of weakness and instability even in the most successful reform programs. These difficult coordination problems include contradictory ministry mandates and responsibilities, overlapping jurisdictional mandates, misuse of political and legislated discretion, discretionary rules and procedures favoring state-owned enterprises, lack of formal inter-authority procedural policies, and ineffective public education, consultation and involvement. These corrosive influences have not yet taken root at this early stage of Mongolia's mineral sector reform initiative.

4.5 The historically established approaches of the state and provincial governments of Australia, Canada, and the United States represent very good examples of such practices. In these jurisdictions, the role of government is to act as manager/regulator of the sector through a lead agency is established that acts as a transparent, neutral referee applying clear, non-discretionary rules equally to all commercial participants. It also acts as a promoter of the nation's mineral endowment and its legal, political, and socio-economic attractiveness. An effective lead agency must build cooperative links with all related government institutions. Private sector firms act as competitive players in the risky and expensive exploration/mining/reclamation stages of mineral development. The more that government institution can demonstrate professional neutrality and absence of conflicts of interest between referees and players, the lower the risk and more attractive the playing field becomes to foreign and local private investors.

4.6 The Mongolian Context. Over the past decade Mongolia's government has evolved from the owner/operator of mines to become a manager/regulator. During the past 18 months, the

Mongolian mineral sector has received unprecedented foreign direct investment attention and corresponding national private sector expansion. This exceptional exploration and mine development activity has focused on Mongolia despite a continuing weak global economy and increasing international competition for risk capital investment. There are many reasons for Mongolia's current pre-eminence. Its mineral sector has established a prominent international profile as a result of its reform initiatives, geological prospectivity, and media exposure of its potential world-class copper and gold deposits in the south Gobi. The stable application of other recent private sector-oriented management policies has also been an essential factor in this success. Implementation of the 1997 Minerals Law has also gained a high positive profile with foreign and domestic investors. This law, coupled with a relatively favorable financial and fiscal regime for mining projects, is the basis for this attractive investment climate. It is in the stability of the overall package that success will continue and expand in the future.

4.7 This section focuses primarily on the 1997 Minerals Law, its legislated regulatory and implementing institutions, and its links with directly related legislation and external government agencies and entities. It should be remembered that the 1997 law is still very young legislation, having only been seriously effective since the removal of the export tax on gold in 2001. It was designed to accommodate government's limited institutional capacity by providing a simple but modern and robust framework supported by appropriate regulations. Clarifying regulations have not yet been developed or prescribed for many license holder obligations. Full compliance with, and enforcement of, many provisions still require further institutional strengthening, greater formal inter-agency cooperation, and improved public education.

4.8 Improved clarification, compliance and enforcement of existing provisions in this highly regarded law can be readily achieved through institutional strengthening; more formalized inter-governmental coordination and additional regulations. Through these available procedural mechanisms, the government can maintain the stability and certainty of the Minerals Law, and achieve its objectives of improving mineral sector management, promoting foreign and domestic investment, accelerating mine production, and generating long-term mineral revenues. The options presented here are designed to make improvements without proceeding with proposed amendments to the law that have already caused serious negative industry reaction as being premature and counterproductive attacks on this well designed framework.

OVERVIEW OF MINERAL SECTOR POLICY AND LEGISLATION

4.9 The Ministry of Industry and Trade (MIT) has the broad mission to provide the framework for national industry to prosper, increase exports and ensure economic growth of the country. One of MIT's priority objectives is the management of the mineral sector. This Ministry is responsible for GOM's national economic development policies on minerals and related geoscientific research, which it does through its Minerals Policy and Coordination unit, and Mineral Resources Authority of Mongolia (MRAM).

4.10 While an official 'National Mineral Policy' had been formulated at the time of enactment of the 1997 Minerals Law, the necessity of establishing overriding policy guidelines integrated with national socio-economic objectives was clearly recognized. Such a policy document has since been developed, which establishes the development of the minerals sector as a priority area with clear objectives and annual targets.³⁸ There is much to be commended within these Guidelines to reach the goals of GOM, which is, 'to develop and promote export-oriented industries and bring the country's economic growth to 6% p.a. by 2004 and 10% p.a. by 2010.' If

³⁸ *Guidelines for Near-Term Development of Mongolian Geology and Mining Sectors that is set out in the attachment to the May 2002 Resolution of the GOM No.103, 16pp, unofficial English translation.*

implemented well and without delay, these proactive steps as set out in Annex VII will improve the investment climate and encourage mineral development.

4.11 There are, however, some ambiguities and potentially adverse implications inherent in this policy that include the assignment of exploration rights to MRAM, the necessity for amendments to the Minerals Law to address specific issues, and the impression that government intends to establish new mining companies in rural areas; new processing plants; or insist on production in accordance with the estimated production levels and deadlines.

4.12 The Minerals Law of Mongolia³⁹ is acknowledged by the international mining community as one of the strongest legal presentations of mineral licensee rights and obligations in the world, and clearly the most investor-friendly and enabling law in Asia. This is due to the clarity of its provisions that establish one-stop first-come / first served' license application and granting procedures, security of tenure' for licensees, regulatory guidance for environmental protection and obligations of licensees, and assignment and transfer of mineral licenses. Nothing should be altered in this law to weaken these important principles. The internationally competitive advantage that Mongolia now enjoys can, however, be further enhanced by additional clarifying regulations, improved formal inter-ministerial coordination, and supplementary legislation to more accurately address the proper conduct of artisanal and, small scale as well as large scale mining operations.

4.13 This approach does not undermine the stability of the legal environment nor the sanctity of security of mineral tenure. It does, however, strengthen the clear intent of the Law that exploration and mining licenses are granted primarily to facilitate the undertaking of mineral investigations leading to production beneficial to both the licensee and the nation. It must be noted that the 'exclusive rights' granted to licensees also include the right to transfer or pledge licenses to and/or with other parties.⁴⁰ This transferability is essential for project financing is one of the fundamental premises that has driven the success of the world's dominant mining jurisdictions – such as USA, Australia, and Canada – from the very beginning of their modern mining histories. It is now a necessary 'entrepreneurial' component in all successful mining legislation.

4.14 The smaller Law on the Implementation of the Minerals Law was a supplement to the Minerals law, both enacted on July 1, 1997. Its transitional purpose was to convert and re-register pre-existing licenses to either new exploration or mining licenses in accordance with the new law. Its only relevance at present is to provide for reimburse of government exploration costs relating to 188 specific deposits. Government's proposals to expand this "deposit list" beyond these deposits by amending the Minerals Law would undermine investment climate and demonstrates a lack of appreciation of the fundamental international investment principles that are the basis for Mongolia's recent mineral investment success.

ASSESSMENT OF REGULATORY AND IMPLEMENTING INSTITUTIONAL CAPACITIES

4.15 The priority activities of Mongolia's Ministry of Industry and Trade (MIT) are to support development of national industries, increase employment through SME's and consumer goods production and protection, determine, collect and evaluate regional surveys of minerals and oil, increase exports by improving international competitiveness of products and services through regional networks, develop foreign trade and promote foreign investment, and introduce advanced administration management, improved technology, and structural reforms.

4.16 With respect to MIT's responsibilities to manage Mongolia's important mineral sector,

³⁹ *Minerals Law of Mongolia, enacted on 1 July, 1997*

⁴⁰ *ML, Articles 12 and 40*

the 1997 Minerals Law is the key platform for introducing structural reform and establishing direct institutional support for sector employment, regional analysis, export competitiveness and foreign investment promotion. This law established the structure and composition of the under Ministry of Industry and Trade (MIT) agencies responsible for implementation of mineral-related legislation.

4.17 An independent regulatory agency, the Geological and Mining Inspection Agency (GMIA), and an independent implementing agency, now called the Mineral Resources Authority of Mongolia (MRAM) were created at that time. An internal MIT Department of Geology, Minerals Policy and Coordination were subsequently formed to more directly link these autonomous agencies to MIT's mineral sector development mandate.

4.18 GMIA has now become a division of a new consolidated inspection agency, the State Professional Supervision Administration. Its 12 officers are now linked to aimag mine inspection agencies reporting directly to the prime minister's office. The rationale for this consolidation was to establish inspection and enforcement independence by separating this regulatory function from potentially conflicting ministry mandates, and to reduce overlapping site inspections through improved coordination.

4.19 MIT's MRAM is the key external implementing agency for minerals and is responsible for issuing mineral licenses, compiling mineral industry information, archiving geological data, and conducting geological surveys and research. It has three divisions: the Office of Geological and Mining Cadastre (OGMC), the Mining Office, and the Office of Geology / Mongolian Geological Survey (MGS)

4.20 A brief assessment of MRAM in April 2003 suggests that it is well established and is performing its defined functions in a credible manner, largely as stipulated in the Minerals Law. A significant reason for this positive assessment is the performance of OGMC, which is the one-stop initial entry point for all applicants and the sole processing and granting office for exploration and mining licenses. In all successful mining jurisdictions, the mining cadastre is the foundation for effective management of sector activities. The core of this system is the recording of all types of mineral rights over clearly identified areas that can be accurately located on standardized maps. A reliable mining cadastre provides all interested investors and applicants with transparent information on areas available for licensing and on the legal status of all areas under license or subject to special conditions. OGMC fulfils the basic requirements of an effective mining cadastre.

4.21 OGMC has 12 officers who implement first-come/ first served procedures, which were randomly checked and found to be transparent, efficient, and in accordance with the law. Some minor deficiencies in the system were observed, and persistent external criticism regarding internal information leaks and discretionary processing practices was noted. There has also been controversy regarding the determination of first come in lineups prior to the official daily opening of the office.

4.22 One major deficiency in the current system is the inability of the computer software to instantaneously determine the land status and availability of pending applications. Upgrading of computer software is an obvious partial solution to this problem. This critical improvement also requires the cooperative data capture of all official multiple, single, controlled, restricted and prohibited land-use designations from state and local land management authorities. A potential ADB-sponsored land information consolidation project of the Bank's PSRC II would be ideal for incorporating the OGMC mineral license map control system into a more comprehensive land-use display capability.

4.23 The transparency and effectiveness of the system will be greatly enhanced when it is possible to instantaneously display, the current mineral license status of all areas in Mongolia,

and all other land use imperatives and constraints. This should then be followed by providing more space and time for computer viewing, public access, and map observation through the week, rather than the crowded current two-day period. Notifications to applicants and licensees indicating that the law's prescribed reporting timeframes and penalties for license violations will be enforced also reinforce positive external perceptions and improve the public credibility of this otherwise excellent system. The question of governance and honesty of government officials, although obviously essential to the proper functioning of OGMC, is a human failing, not a structural deficiency of the cadastre.

4.24 The Mining Office, with a small staff of eight professionals, is responsible for monitoring, and conducting research on, the technological and socio-economic impacts of the mining industry. An important current focus is the regulatory administration of the mining license agreements resulting from the 1997 Implementation Law.

4.25 The Office of Geology originally designed to consolidate the functions of the former State Geological Center and the State Geological Informational Fund. This MRAM division, also known as the Mongolian Geological Survey (MGS), comprises four functional units: Geological Research Team, Mineral Resources Evaluation Team, Geological Information Center (GIC), and the Budget Planning Team. The largest of these, the GIC, has 34 officers, and is responsible for archiving all geological information, maps and records concerning geological research in Mongolia. The other three units have a total of 12 officers who are responsible for regional geological, geophysical and geo-environmental mapping and research. Because of the limited number of field geologists, much of this research is contracted out.

4.26 Although contracting out this useful research solves the shortage of staff issue, it also creates problems for internal management control and confidentiality of collected field data. Of equal concern is the intention to recover the costs of the surveys through a public auction process.

4.27 MRAM/MGS geological survey and tendering activities at times overlap with functions assigned to the internal Department of Geology, Minerals Policy and Coordination. MIT is assessing this overlap. One option under serious consideration is to strengthen the regional mapping capability of MRAM/MGS to undertake this research and obviate the need for contractors. A major recipient of MIT budgeted funding for regional mapping projects has been the state-owned Geological Research Center reporting to the State Property Committee. Its research mandate is broadly based and increasingly focused on capturing more lucrative private sector contracts for its professional services. MIT officials feel that their ministry's policy priority to increase regional geological mapping would be better served if geologists from the Center were transferred to MRAM. On the surface, this appears to be an excellent option. Although a large number of geologists are currently employed by the center, the transfer of 20 qualified field geologists is considered more than adequate to fulfill an in-house mapping requirement. University geology students would assist these senior research scientists during the field-mapping phase of such programs.

4.28 This transfer should not require additional budget allocations, as the transferred geologists are already public servants. If, however, the government intends to accelerate mapping additional funding may be required. Consideration should be given to allocating revenue derived directly from the mineral sector back to the institutions that promote and regulate those private sector activities.

PRIORITY MINERAL SECTOR MANAGEMENT ISSUES

4.29 Mongolia's policy, legislative, and institutional framework for managing its mineral sector has major strengths in its adherence to most of the international best practices that are enshrined in the Minerals Law and being implemented by a clearly mandated autonomous lead agency (MRAM). Its weaknesses include a lack of regulations relating to the rules and procedures for local government and land user permissions/contracts, governors' approval of environmental submissions, and notifications and enforcement of sanctions for license violations. It also fails to specify adequately the form and content of reports related to exploration and mining license obligations and initial feasibility study requirements.

4.30 There is also poor coordination among the Ministries of Nature and Environment, Finance, and the State Professional Supervision Administration, as well as inter-governmental regulatory and information management and the local administrative bodies.

4.31 Mongolia also lacks a special Artisanal Mining Law, local community participation and public education and information mechanisms, and needs a new production-specific conduct of operations mining law.

IMMEDIATE INITIATIVES

4.32 These weaknesses - with the exception of the drafting of an Artisanal Mining Law, already being fast-tracked?? should be addressed over the next 12 months through non-controversial policy, legislative and regulatory initiatives designed to reinforce the minerals management and administrative framework. This structural strengthening process should be started immediately through the creation of a Mineral Sector Management Task Force of senior representatives of all directly responsible ministries, authorities and local administrative bodies. Liaison status should be accorded the Mongolian National Mining Association to promote better public/private dialogue and facilitate appropriate industry and public stakeholder inputs. As a first step, the government guidelines should be revisited and updated by:

- Creating an inter-ministerial task force to begin the drafting implementing regulations to clarify Minerals Law provisions.
- Establishing a time-bound action plan to design and draft a separate supplementary mining law that builds on the license security principles of the Minerals Law, and integrates the monitoring, inspection, and enforcement requirements of all legislation and regulations directed at mining operations.
- Establishing a time-bound action plan to draft formal ministerial and minister-governor memoranda of understanding to clarify and streamline licensee reporting and notification obligations to external entities, as specified in the Minerals Law.

4.33 The task force and its working groups should enlist the support of international mineral policy experts to integrate international best practices into new regulations, laws, and regulatory coordination frameworks.

PROPOSED MINERALS LAW AMENDMENTS

4.34 MIT has included proposed Minerals Law amendments in the guidelines and published these for public comment. They have been strongly criticized by the private sector, as seriously undermining the international best practice principles enshrined in the Minerals Law, increasing uncertainty, and discouraging investment. Many interesting deposits are moving from the ad-

vanced exploration stage into the exponentially more expensive final feasibility and production?exploitation?stages. Confidence in the future stability of the current mineral policy, fiscal, and legislation framework is fundamental to licensee decisions to proceed. The implications of some of the proposed amendments to the Minerals Law are discussed below.

4.35 New exploitation agreements. The amendments call for exploration and mining license repayment agreements for state-funded exploration work and clarification of the obligations of licensees related to bringing deposits into production within this new agreement provision to be imposed on existing and future mining license holders.

4.36 The 1997 Law on the Implementation of the Minerals Law calls for five-year repayment agreements for 188 existing designated deposits; these should be regarded as a one-time good will legal conclusion to this unfair and anachronistic concept. This, along with other modifications to existing agreements, can be accomplished with little difficulty through the implementation law without amending the Minerals Law. The proposed amendment to extend the repayment concept and add additional obligations for other current and all future licensees is of great concern and has been strongly opposed by the investment community, as it threatens the government's private sector-oriented reforms, undermines the stability and standing of the Mining Law, and increases the risk to and cost of new investment. The discretionary ability to revoke a mining license implied in point viii exacerbates this situation and would be unacceptable to most credible investors. The Minerals Law already requires licensees to meet many of the obligations proposed by MIT⁴¹

4.37 Any suggestion that mining licensees should legally agree to government-imposed production schedules, or maintain government-calculated production quotas is contrary to basic economics and international practices in competitive mining jurisdictions. It is also somewhat presumptuous to assume that a government officer can determine or modify complex site-specific feasibility and production parameters on a project that the investors, their staff, international lending agencies and independent mining and mineral investment advisors have worked on (and paid for) over many months and years. While there must of course be government regulation, monitoring, and inspection of acceptable conduct and standards, operational decision-making and final responsibility for proper conduct must be left in the hands of private investors.

4.38 It is, thus, recommended that the agreement amendment be abandoned in favor of notification and report regulations specifying form, content, and objective reporting criteria to cover all necessary regulatory obligations with respect to exploitation. This should be coupled with more rigorous enforcement of the sanctions against non-compliance already provided for in the Law. Examples of such regulations are available as attachments to most established mining legislation.

4.39 Governor's approval for mineral licenses. The proposed amendments also call for imposition of a short timeframe (10 working days) for the currently unwieldy governors' approval of

⁴¹ Article 4.8 defines exploration to include all activities up to and including technical and commercial feasibility; in other words, up to but not including mining.

Article 4.2 defines mining as the actual extraction of minerals and their beneficiation and subsequent sale.

Article 4.3 defines a mining license as the right to conduct mining.

Article 18.8 illustrates the seriousness of moving from exploration to exploitation for applicants and the government, by granting mining licenses for 60-year periods. In recognition of this, Article 39.4 requires exploitation feasibility studies within 60 days of obtaining mining licenses, and periodic reports thereafter to document production schedules, employment statistics, mine plans, reserve calculations, sales, etc. Thus, it requires professionally prepared technical, submissions documenting the economic, environmental and social obligations mining licensees undertake. Regulations to clarify these important and diverse obligations should be drafted as soon as possible. Reporting obligations are of course not agreements, but the regulations should prescribe that they be accurate representations of the intended commitment of licensees, and should be signed by the reports' authors along with documentary proof of their technical qualifications and professional registrations. The creation of a supplementary mining law will further reinforce licensee rights and obligations relating to proper conduct of operations.

license applications to correct the negative impact of provisions in the January 2002 Special Licensing Law. That law requires business entities to vet their regional operational intentions with relevant provincial governors before receiving final government approval of license registration. The good intentions of this legislation to involve the regions in national regulations affecting them are not disputed. The approach taken by MIT/MRAM to comply with this new license adjudication requirement has caused serious delay and confusion to the formerly efficient OGMC application and approval process. The proposed amendment recognizes the need to clarify and correct this situation, but the problem should not be solved by amending the Mineral Law?instead changes should be made in the 2002 Special Licensing Law provisions that made the approval of a mineral license conditional on permission from governors. This interpretation violates the provisions of the Minerals Law and is fundamentally unconstitutional.⁴²

4.40 There is no quarrel with the Special Licensing Law's intentions to have licensees inform governors and seek their opinions and land-use permission, prior to commencing mining activities in his jurisdiction. This is already demanded of mineral licensees in Article 6.4.2 of the Minerals Law. Any legitimate concerns expressed by a governor at that time could subsequently affect the conduct of such activities, or based on land-use precedents, even cause an adjustment to a granted license area. But it cannot affect the legal status of the license. It is also legally contradictory to the application and granting process, under Article 14 of the Mining Law, to suspend or withhold the final granting of a license by the state until a written approval or rejection is received from aimag authorities.

4.41 Out of about 2,000 exploration license applications received by OGMC since June 2002, when OGMC adopted this revised procedure, 1,000 were granted. Presumably, most of these had attached governor's approval forms. But 47 were rejected by OGMC as a result of governor rejections, 78 were rejected due to arbitrary time limits on non-return of written governor approval forms, and 250 applications are still pending, waiting for these forms to be returned. Apart from the logistical unfairness of this procedure, this governor approval provides each aimag governor with a de facto veto on mineral resources they do not own, have no constitutional right to exercise, and that OGMC has no legal mandate to honor.

4.42 Despite this serious deficiency, there is no need to consider the amendment. The proposed 10 working days limit for returning forms from distant aimags is unrealistically short. The government can, however, easily address this self-imposed procedural obstacle to the hitherto efficient, non-discretionary mineral license granting process. It should advise governors of the Law's requirement that licensees prior to starting any activity in their jurisdictions consult them. In addition, the Special Licensing Law should be clarified or amended to reflect the intent of the existing mining-related provisions, and there should be an early resumption of OGMC previous granting process. To facilitate this process, a form should be attached to each granted license stating the legal requirement that no access to the involved aimag area is allowed without the signed permission of the governor or his delegated land management authority. The signed form is to be subsequently registered at OGMC within a reasonable time.

4.43 If an aimag has land-use concerns, the governor's written opinion will be returned with the form and adjudicated by MRAM. If a legal constraint is confirmed, the license would be amended accordingly. If land-use permission is denied, the exploration license holder may appeal the decision to OGMC, and through the dispute mechanisms available under Article 50 of the Law.

4.44 Reserved areas for MRAM's 1:50,000 mapping programs. The amendments propose to reserve areas for state-sponsored mapping and recovery of associated costs; this is inappropriate.

⁴² The Mineral Law states in Article 2 that "the mineral resources in Mongolia are the property of the state", and in Article 3 that "the state, as owners of all mineral resources in Mongolia, has the right to grant ... licenses ... in accordance with ... this law."

ate and contrary to practices in competing jurisdictions. This mapping is already clearly specified as a function of MRAM. It is a useful and desirable promotional activity and a basic research tool used by the geological surveys of state mineral resources institutions all over the world; it is best conducted through in-house capability rather than outsourcing.

4.45 It is, however, not necessary or desirable to close areas to licensing to conduct such surveys. Areas that MIT/ MRAM determine to be prospective for certain minerals that are not being targeted by private exploration companies should first be subjected to library research and this analysis should then be advertised and made available to the public at nominal publication cost. As part of this promotional effort, it should also be advertised that these areas have been given priority for updated 1:50,000 mapping and additional mineral inventory assessment. The time frame for the initiation of mapping (commonly at least a three -ear exercise) should be simultaneously announced. The survey should take place over this area regardless of whether it is subsequently fully or partially licensed. In fact, this approach in itself will attract private companies to prospective areas at no cost to the state. When map and attached regional notes are complete, further advertisement will be made indicating release times and dates. Such areas should never be closed as reserved areas, or worse still, reserved as exploration licenses registered to the Office of Geology, as is the current practice. MIT/ MRAM should never be perceived as competing with the private sector in any manner, as clearly prohibited in Article 6.5.

4.46 As an alternative to the current (illegal) exploration license practice or the proposed reserved area amendment it is recommended that MIT complete initial promotional research, and publishes the reasons MIT/ MRAM has decided to promote areas through its 1:50,000 mapping mandate. MIT should also reopen the closed exploration license areas now registered to Office of Geology, prioritize the areas in order of perceived prospectivity and announce its intention to systematically conduct the surveys, either by controlled contracts or, preferably, by MRAM professionals. It should also announce public release times for maps and accompanying notes, at nominal cost.

4.47 This is standard international best practice in all successful mining jurisdictions. It is effective as a research contribution to investors and to better understanding of the natural resources endowment of the nation, as other aspects of the areas (water, flora and fauna, infrastructure) would also be assessed.

4.48 This approach also eliminates the necessity for a proposed amendment for annual auctions of “areas where...new discoveries are made” by state-funded mapping and surveys. Auctions for licensee access to closed regional survey areas are contrary to the transparent first-come/first served principle, and are not regarded as necessary or beneficial by most potential private sector recipients.

4.49 The arbitrary closing of attractive mineral areas under the assumption that they will generate future revenue at auction creates uncertainties in government and industry circles, as they may take much longer to complete than intended, and remove attractive areas from private-sector exploration for unnecessarily extended periods. They may be considered as a waste of money if no discoveries are found, and could embarrass government if industry shows little or no interest in the auctions.

4.50 Finally, the amendment is unnecessary, as any notion that a mineral discovery encountered during a non-ground-disturbing regional geological survey will lead to a mining operation is fanciful. Statistically, only one out of every 10,000 mineral occurrences determined during regional mapping becomes a profitable mine. Such wildly risky and expensive gambling should be left in the willing hands of private investors, not the taxpayers of Mongolia.

4.51 Special protected areas. The Minerals Law clearly specifies that the authority for decisions relating to mineral exploration and mining on state special protected areas is assigned to

parliament. A special framework to regulate these activities, as proposed above, needs no further amendment to the Law. Regulations can be prescribed and implemented under this enabling clause assuming, of course, that such controlled activities are intended to be conducted only by the private sector or business entities in which the state holds interests.

4.52 Regulations for artisanal mining. MIT's originally proposed an amendment to deal with artisanal mining, but now has correctly decided to draft a new special law.⁴³

4.53 The draft law's provision restricting artisanal mining to formally established cooperatives may well dissuade independent-minded ninjas from becoming legalized. If this restriction is then extended to exploration licenses, it will be in conflict with the Minerals Law provision allowing individual applicants. Its provision relating to small capacity equipment elevates traditional manual artisanal mining into the category of small-scale mining, as depths of more than 3 meters are permitted with shoring. This transition may require further definition, and more detailed regulations to better control, monitor, inspect and assist in the inevitable escalation to more complex and hazardous mining methods, especially the extraction of hard rock gold, coal and fluorite. The next three observations also relate to this possible escalation in the mining status and use of more complex technology.

4.54 The security of title for exploration and mining licenses under the Minerals Law does not appear to be extended to the cooperative artisanal mining title. A governor's ability to arbitrarily terminate agreements and certificates would conflict with the non-discretionary security available to license holders under the Minerals Law. This introduces an unfortunate element of discrimination into an otherwise equal mineral title management structure. It has especially negative implications where cooperatives can gain title to ground relinquished by others under Articles 45 and 46 of the Minerals Law. While it is assumed that such title will be granted as an exploration license, this should be more explicitly stated in the Law.

4.55 A similar non-discretionary clause should be considered specifying the transparent terms under which governor-regulated cooperative certificates can be revoked. Secure continuity of title is especially important in the transfer from soum-registered artisanal certificates /agreements to OGMC-registered exploration licenses. Standard forms for the agreements between licensees, soum and aimag governors, and cooperative certificate holders should be prepared as attachments to the Law.

4.56 The proposed stipulations that cooperatives be formed in accordance with Article 481 of the Civil Code and should prepare charters, pay taxes, set aside various mandatory funds and adhere to state labor and health and safety regulations, could significantly restrict many traditional artisanal activities. It would also, however, make these groups fully constituted citizens, and as such, they would or should qualify for SME status and assistance. For cooperatives to be successfully established, they will need the capacity to legally license areas for their workings. This may prove difficult in areas where commercial operators and other licensees presently hold all of the land. In such cases it may be possible facilitate access to agreed areas under specific conditions for the purposes of artisanal mining.

4.57 The transformation of illegal ninja miners into responsible cooperatives will require considerable consultation, education, and support of all involved stakeholders. This natural evolution should not be regarded as a problem, but as an opportunity to promote local community development. The intention to integrate these cooperatives into soum-administered small business enterprises opens numerous other opportunities to establish similarly organized support and service groups linked to mining.

⁴³ Subsequent to the discussions with MRAM on this new legislation an unofficial English translation of an updated draft was made available for comment. The observations above are based on analysis of this draft.

4.58 Infrastructure and environmental management and mine-site reclamation spin-offs are obvious beneficial extensions. Informal contractors are already operating as drilling, trucking, equipment and marketing service suppliers. Cooperatives and SME specialists to build them into more organized legitimate local business entities should assess these pragmatic initiatives. This type of mining, similar to all other types, is in the business of extracting a finite amount of product over a limited time frame. Therefore, efforts should be made to identify and create other locally viable entrepreneurial business ventures independent from mining that strengthen the diversified social and environmental fabric of artisanal mining communities. State and local revenues captured from these new mining entities should be used along with additional funding to encourage sustainability in these communities. Poverty reduction and local community sustainable development partnerships are the key concepts to be addressed in this important long-term strategy.

CONCLUSION

The thrust of this review is to maintain the legislative and institutional stability that has created foreign and local investment momentum in Mongolia's mineral sector over the past two years. This stability can be strengthened in the short term through the drafting of detailed regulations prescribed by the Minerals Law, establishment of formal sector management links with ministries and local authorities, and the enactment of a special artisanal mining law to integrate this socially important activity into the current large-scale mining framework.

In the intermediate term, stronger government management, monitoring, and inspection of private sector mining activities can be accomplished through the introduction of regulations focused on comprehensive rules and procedures for proper conduct of commercial mining operations.

Many of these initiatives have already been outlined by the government's guidelines. Recommendations for action on these initiatives, as well as optional solutions to improve the government and MIT management responsibilities to promote increased orderly investment suggested here have been designed to balance the reinforcement of the current investment climate with the strengthening of the government's ability to manage its future mineral sector expansion in the best interests of its citizens



PROJECTED ECONOMIC IMPACT OF MINING SECTOR

CHAPTER 5

5.1 This section undertakes to assess the financial and economic performance of the actual and potential operations identified by the study, the mining sector's medium-term growth potential and its impact on the macro economy. These projections are based on the geological and technical characteristics of each mine or mineral prospect; price distributions for the main commodities of copper, gold and zinc; cash flow probabilities; and the correlation between them. These individual results were then consolidated to produce aggregate output and growth estimates for the non-fuel minerals sector, which formed the basis for a macro economic assessment of the sector's potential impact on the economy.

5.2 Under reasonable assumptions the expected growth in mineral output in the medium term is encouraging, with a mean annual increase of 22 percent in zinc production, 7.5 percent in gold production and 3.4 percent in copper production. On the basis of these production estimates, the model estimates mean industrial output and export earnings will increase on average by 11.6 percent annually, from Tg 301 billion in 2002 to Tg 580 billion in 2008.

5.3 The results from the simulations show expected growth in the mining component of GDP of 11.9 percent pa for the base case scenario over the next 5 years. A more optimistic scenario, which assumes higher commodity prices, shows yearly growth of 27 percent, while a pessimistic scenario, with lower commodity prices, shows a decline of 3 percent pa. The mining sector is poised to make a robust economic contribution and support the government's average annual GDP forecast of 6 percent annually by 2004 and 10 percent annually by 2010.

5.4 Despite the attractive tax holidays the government is offering investors and a decline in the proportionate contribution of the income tax component, fiscal projections are also very encouraging. Annual income tax payments associated with the medium-term growth forecast are expected to increase 9.0 percent from Tg 16.2 billion in 2002 to Tg 29.9 billion in 2008. Royalty payments are forecast to increase by an average annual rate of around 13.4 percent to a level of Tg 19.4 billion over this period.

Projected Medium-term Mineral Sector Performance

5.5 These estimates are built around data collected from each mine, company reports and feasibility studies, and official MRAM mining sector data, which were supplemented by extensive interviews with mining company representatives. Existing reserves were noted for each mine, planned production rates in the short to medium term were recorded and any planned mine developments (likely to alter production data) were assessed using existing data.

5.6 A model for each of the mines, more fully described in Annex I, was developed on the basis of a) expected commodity prices that were randomly generated from the Bank's mean commodity price assumptions¹, the historic standard deviations of these prices and the correlation between them; and b) estimates of future production estimates, head grade, process recovery rate, mineral output, operating cost structure and levels of taxation. Subjective probabilities were assigned to each data set reflecting both the robustness of the data, the stage of development of the operation, and the likelihood of project development (i.e. existing mines 100%, developing mines 70-80% and green-field exploration prospects 50%). These probabilities are correlated to the price assumptions used and are adjusted either upward or downwards depending on the value of these assumptions.

5.7 A number of other assumptions in real 2003 terms are made in constructing the base case. These are:

- Copper price of 75c/lb in 2003 rising gradually to 85c/lb over the next three years.
- Mo and fluorspar prices remain static at \$3.2/lb and \$70-110 /ton respectively.

- Fluorspar prices and size of export market remain constant.
- Gold price US\$300/oz.
- Zinc price will recover from unprecedented lows of \$760/ton in 2003 to \$1000/ton from 2008 onwards
- Monthly price volatility for gold, copper and zinc was used for the past two years and reflected an annual average standard deviation of 11.6 percent, 12.6 percent and 13.2 percent respectively
- The legal/regulatory framework and investment climate in Mongolia remains favorable to mining sector FDI
- Adequate infrastructure (physical and regulatory) is provided for the growth of the sector.

5.8 In evaluating the prospects for the sector, three scenarios were selected from the large number of simulations that were generated, and comprised a base case or mean representing the most likely outcome for the sector and its contribution to GDP, and an upper and lower bound of one standard deviation representing the optimistic and pessimistic scenario respectively. These cases attempt to model both the degree of sector reforms and the probability of the price assumptions being above or below those assumed for the base case.

5.9 To determine the impact of the mining sector on industrial output, export earnings, fiscal receipts and GDP growth, a series of projections were made for each of the 27 known mining operations and proposed projects in the sector. These were based on the commodity price distributions, cash flow probabilities and correlations between the two that was referred to earlier. The individual projections were then consolidated to provide expected aggregate results for the sector. The expected growth in mineral output in the medium-term is encouraging and shows a mean annual increase in zinc, gold and copper of 22 percent, 7.5 percent and 3.4 percent respectively.

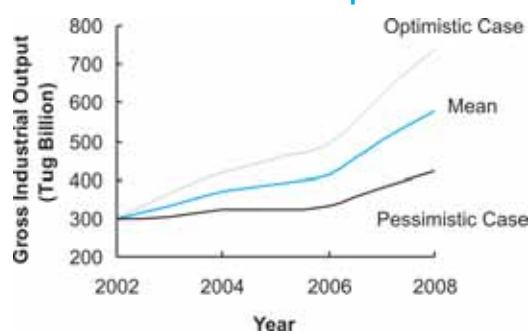
Table 5.1: Projected Mineral Production

	2002	2003	2004	2005	2006	2007	Growth % pa
Copper Concentrate (tons)	502,491	488,604	492,692	498,558	490,385	592,712	3.4
Copper Cathode (tons)	1,542	1,234	2,467	10,101	16,781	21,553	69.5
Molybdenum Concentrate (tons)	3046	3,353	3,537	2,122	884		
Molybdenum Oxide				707	1326	1769	
Fluorspar Conc (75%) (000 tons)	80	73	73	77	77	77	(1.0)
Fluorspar Conc (92%) (000 tons)	89	103	106	111	111	111	4.6
Gold (Kg)	10,326	10,817	13,549	13,503	11,559	14,844	7.5
Zinc Concentrate (tons)				20,129	48,310	53,677	21.7

5.10 On the basis of these production estimates, industrial output and export earnings are expected to increase by 11.9 percent pa over the next five years from Tug 301 billion in 2002 to Tug 580 billion in 2008. The upper and lower bounds of one standard deviation of the mean growth in industrial output are illustrated in Figure 5.1 and range from 420 - 740 billion Tug.

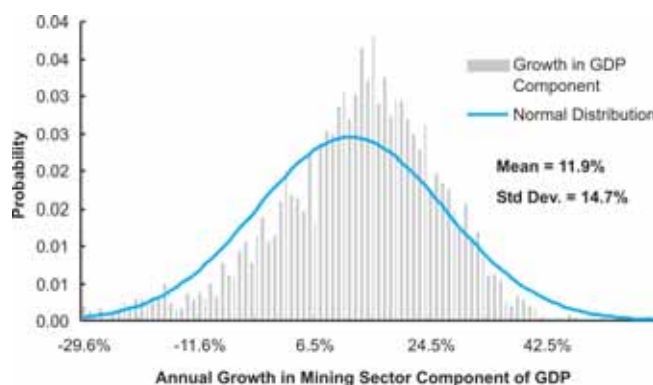
5.11 Results from the simulations, approximated below in the form of a normal distribution

Figure 5.1: Projected Growth in industrial Output



curve, show expected annual growth in the mining sector component of GDP of 11.9 percent for the base case scenario over the next 5 years, with the optimistic scenario (higher commodity prices,) showing a growth of 26.6 percent pa and the pessimistic scenario (lower commodity prices) showing a decline of 2.8 percent pa. The mining sector is therefore poised to make a robust economic contribution and underpin the government's GDP growth estimates of 6 percent, provided of course it maintains the stability of the legal and fiscal framework, and its commitment to private sector development of the minerals sector. The base case growth rate is on par with the GOM's own goal, as stated in the National Mineral Policy, to bring the country's economic growth to 6 percent by 2004 and 10 percent by 2010.

Figure 5.2: Mining Sector Growth Forecast



MACRO ECONOMIC IMPACT OF MINERAL SECTOR GROWTH

Contribution of mining industry to the growth of Mongolian economy

5.12 Mining sector is Mongolia's fourth largest sector of economy contributing 10.2 percent of GDP after livestock (27.8), wholesale and retail trade (23.3), and transport and communications (10.9) sectors over 1996-2003. It is, however, the largest sector in foreign trade sharing 53 percent of total exports, while the mining sector employs about 2.4 percent of total employed.

5.13 Mining sector gross industrial output is projected to increase sharply from US\$266.3 million in 2002 to US\$496.2 million in 2008. However, due to highly capital intensive nature of the industry the contribution of the mining sector to GDP is expected to increase slightly from 10.4 percent in 2003 to 10.7 percent in 2008, reflecting an anticipated growth in output of copper and gold with start up of Erdenet Cu Leach Plant, Oyu tolgoi copper and Boroo gold mines. (Table 5.2)

Table 5.2: Mining sector expected contribution to GDP

	2002	2003	2004	2005	2006	2007	2008
	Actual	Estimate			Projection		
In percent	8.7	10.4	10.3	9.7	10.4	10.7	10.7
In billions of togrog ¹	107.4	141.8	157.2	163.9	194.4	221.6	246.3
In millions of US dollars	96.7	123.7	135.0	135.7	157.3	175.0	189.7

¹ Sales revenues in togrog value were adjusted using the IMF projected Tg/US\$ rates.

Source: WB, Mongolia Sources of Growth Study – Mining Projections, 2004, and staff estimates.

5.14 At current levels of production copper would play an important but decreasing role in economy due to continuing decline in the quality of copper ore grade at Erdenet mine and

depleting deposits. However, recent developments in Mongolia's mining sector bode well for Mongolia's economy. With current discoveries and exploration of new deposits mineral production in Mongolia is set to increase radically. Taking into account the anticipated new investments the gross copper output is estimated to increase from about US\$151.5 million in 2003 to US\$318.1 million in 2007 and US\$412.2 million by 2008, thus improving the early output projections of the industry by US\$91.2 and 170.4 million which is equivalent to 5.6-9.6 percent of GDP. (Table 5.3)

Table 5.3: Comparison of the current and new projections on copper output ^{1,2}

	2002	2003	2004	2005	2006	2007	2008
	Actual	Estimate	Projection				
Current projection	140.2	164.7	213.8	215.3	217.3	226.9	241.7
New projection	136.9	151.5	169.8	191.1	212.7	318.1	412.2
Difference	-1.0	-13.1	-44.6	-24.1	-4.6	91.2	170.4
Difference as % of GDP	-0.1	-1.1	-3.5	-1.7	-0.3	5.6	9.6

¹ Includes the copper output of Erdenet, Erdenet Cu Leach Plant, Erdmin and Oyu Tolgoi mines.

² Sales revenues in togrog value were adjusted using the IMF projected Tg/US\$ rates.

Source: WB, Mongolia Sources of Growth Study – Mining Projections, 2004, and staff estimates.

Impact of mining output in the government revenues and overall balance

5.15 The tax and royalty revenues from mining sector accounted for about 6 percent of the total government revenues in 2003. The Government mining revenues generated from the corporate income taxes (most of the mining companies fall in to the top tier 40 percent tax brackets), and royalty fees for the use of environmental resources set at 2.5 percent of sales for minerals other than gold. The royalty for gold is set at 7.5 percent. Minor income comes from the dividends of state-owned mines.

5.16 The government mining sector total revenues are estimated to grow at 10.4 percent annual rate (revenue from corporate tax at 9.0 percent and royalty at 13.1 percent) over the medium-term. However, as percentage of GDP the mining revenues are expected to drop from 2.4 percent of GDP in 2003 to about 2.1 percent by 2008. The fall in corporate income tax revenues from 1.7 percent of GDP to 1.3 percent by 2008 is expected to be offset partly by boost in royalty revenues from copper, gold and other mines. Royalty revenues are estimated to grow from 0.7 percent to 0.8 percent of GDP. Royalties are thus expected to become a major mining revenue source for the Government in the period ahead (Table 5.4).

Table 5.4: Government mining revenues projection
(In billions of Togrogs)

Year	Company Tax	Royalty	Total mining revenue	Tax rev as % of GDP	Royalty rev % of GDP	Total rev as % of GDP
2002	16.2	8.3	24.5	1.3	0.7	2.0
2003	23.5	9.7	33.2	1.7	0.7	2.4
2004	20.0	14.5	34.5	1.3	1.0	2.3
2005	20.9	14.7	35.6	1.2	0.9	2.1
2006	24.8	14.6	39.4	1.3	0.8	2.1
2007	29.8	17.0	46.8	1.4	0.8	2.3
2008	29.9	19.4	49.3	1.3	0.8	2.1
Annual Growth	9.0%	13.1%	10.4%			

Memo:

1. The forecast incorporated the government's recent decision to lower corporate income tax from 40 percent to 30 percent from the 2004 financial year.

2. Tax and royalty revenues in togrog value were adjusted using the IMF projected Tg/US\$ rates instead of 1130 Tg/US\$ flat rate.

Source: WB, Mongolia Sources of Growth Study – Mining Projections, 2004, and staff estimates.

5.17 The contribution of Erdenet copper mine in total government mining revenues is expected to go up in the short-term due to buoyant export proceeds underpinned by favorable world market prices. The share of tax revenues from Erdenet in the total mining sector tax revenues are projected to increase from 63 percent in 2003 to 87 percent in 2006. In medium-term, declining tax revenues from Erdenet copper mine due to depletion of its resources on one hand, and resurgence of gold revenues on the other will likely lead to the fall of copper sector contribution in tax revenues to 77 percent by 2008. The commencement of Oyu tolgoi copper mine will not contribute to the tax revenues in medium-term, due to tax exemptions and accelerated depreciation on investment. The Oyu tolgoi mine is expected to contribute in royalty fees from 2007, which could make 19 percent (US\$3.8 million) of the total royalty revenues.

5.18 The revenue forecast with increased output resulted in a modest increase in copper revenues (including the commencement of Erdenet Cu Leach Plant and Oyu tolgoi mine) that could improve the overall budget balance in the range of 0.3-0.6 percent of GDP between 2003 and 2008 (from 4.7 to 7.7 million US dollars). As a result, the projected 3.5 percent overall deficit in 2008 could be cut down to 3.1 percent of GDP). Simulations without revenue contributions from Oyu tolgoi predict some lesser impact on the fiscal balances that brings down deficits from 3.5 to 3.3 percent of GDP by 2008, if spending remains at the projected level.

5.19 The bulk of this impact is expected to come from royalty revenues from Erdenet and Oyu tolgoi. By 2008 royalty revenues from the mines are expected to increase from 29.2 in 2003 to 39.4 percent of the total mining revenues. Dividends estimated at less than 10 percent of net profit are accounted for about 0.1 percent of GDP throughout the period (Table 5.5).

Table 5.5: Erdenet¹ and Oyu Tolgoi contribution to Government revenue

	2002	2003	2004	2005	2006	2007	2008
	Actual	Est.			Projected		
<i>(In percent of GDP)</i>							
New copper proj. impact ²	0.0	-0.6	0.6	-0.3	0.3	0.4	0.5
New copper proj. impact ³	0.0	-0.6	0.6	-0.3	0.3	0.4	0.5
Overall balance (incl. grants) –current proj.	-6.0	-4.5	-5.1	-5.0	-4.5	-4.0	-3.5
Overall balance (incl. grants) –current proj. ³	-6.0	-4.2	-4.6	-4.6	-4.2	-3.6	-3.1
Copper rev contribution –current proj. ²	1.0	1.9	1.0	1.9	1.4	1.4	1.2
Copper rev contribution –current proj. ³	1.0	2.2	1.5	2.3	1.7	1.7	1.5
Tax ⁴	0.8	1.7	0.8	1.8	1.3	1.3	1.1
Royalty	0.0	0.3	0.4	0.4	0.4	0.3	0.3
Dividends	0.2	0.1	0.2	0.1	0.1	0.1	0.1
Overall balance (incl. grants) – new proj. ²	-6.0	-5.1	-4.5	-5.4	-4.2	-3.6	-3.0
Overall balance (incl. grants) – new proj. ³	-6.0	-4.8	-4.0	-5.0	-3.9	-3.3	-2.6
Copper rev contribution – new proj.	1.0	1.2	1.6	1.5	1.7	1.8	1.7
Tax	0.8	1.1	1.1	1.1	1.2	1.2	1.1
Erdenet	0.7	1.1	1.0	1.0	1.2	1.1	1.0
Erdmin	0.0	0.0	0.1	0.1	0.1	0.1	0.0
Oyu Tolgoi	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Royalty	0.0	0.0	0.4	0.4	0.4	0.5	0.5
Erdenet	0.0	0.0	0.3	0.4	0.4	0.4	0.3
Erdmin	0.00	0.0	0.01	0.0	0.0	0.0	0.01
Oyu Tolgoi	0.0	0.0	0.0	0.0	0.0	0.1	0.2
Dividends	0.2	0.1	0.2	0.1	0.1	0.1	0.1
Erdenet	0.2	0.1	0.2	0.1	0.1	0.1	0.1
Erdmin	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oyu Tolgoi	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Memo:

¹ Erdenet includes Erdenet Cu Leach Plant from 2005.

² Current projections without royalty payments.

³ Current projections adjusted with 2.5% royalty on export sales.

⁴ Tax estimates reflect the decrease of corporate income tax from 40% to 30% from 2004.

Source: IMF, WB Mongolia Sources of Growth Study – Mining Projections, 2004, and staff estimates.

Impact of copper exports on Balance of Payments

5.20 Over the medium-term to long term (2007-2009) copper exports are projected to more than double. Total expected revenue from copper production would rise from US \$ 139.2 million to US \$ 412.2 million. These significant increases in export revenue would reverse fully reverse the current account trends from a deficit of 9.6 percent of GDP in 2002 to a surplus of over 2.8 percent of GDP. In the short term however proceeds from copper exports are projected to drop from about US\$ 13 million to US\$ 45 million between 2003 and 2006, widening the current account balance deficits 10.3 percent in 2003, to 11.4 percent in 2004. The downward trend is likely to continue through 2006. The anticipated start up of Erdenet Cu Leach Plant in 2005 and later Oyu tolgoi mine in 2007, is expected to more than offset the export decline. Gains in increase copper production are conditional on price fluctuations that terms of trade remain stable and the government maintains flexible exchange rate policy (Table 5.6).

Table 5.6: Impact of Copper Exports on Balance of Payment¹

	2002	2003	2004	2005	2006	2007	2008
Current projections							
Copper export (In millions of US dollars)	140.2	164.7	213.8	215.3	217.3	226.9	241.7
(In percent of GDP)							
Current account balance, incl. official transfers	-9.5	-9.2	-7.3	-7.0	-7.5	-7.3	-6.9
Current account balance, excl. official transfers	-16.1	-15.2	-13.0	-12.2	-12.4	-11.8	-11.0
New Projections							
Copper revenue (In millions of US dollars)	139.2	151.5	169.1	191.1	212.7	318.1	412.2
(In percent of GDP)							
Current account balance, incl. off. transfers	-9.6	-10.3	-11.4	-9.4	-9.1	-1.8	2.8
Current account balance, excl. off. transfers	-16.2	-16.3	-17.5	-15.1	-13.9	-6.2	-1.4
Impact (Difference)							
Copper revenue (In millions of US dollars)	-1.0	-13.1	-44.6	-24.1	-4.6	91.2	170.4
(In percent of GDP)							
Current account balance, incl. off. transfers	-0.1	-1.1	-3.5	-1.7	-0.3	5.6	9.6
Current account balance, excl. off. transfers	-0.1	-1.1	-3.5	-1.7	-0.3	5.6	9.6

Memo:

¹ Includes the copper output of Erdenet, Erdenet Cu Leach Plant, Erdmin and Oyu Tolgoi mines

Source: IMF, WB Mongolia Sources of Growth Study – Mining Projections, 2004, and staff estimates.



RECOMMENDATIONS AND OPTIONS

CHAPTER 6

6.1 Based on the findings of this study, it is recommended that government move to improve investor confidence by addressing potential constraints to mining sector growth in the following areas; Investment Climate, Taxation, Legal and Regulatory Framework, Artisanal Mining.

6.2 General

- Government should maintain close contact with the mining investment community, which is seeking initiatives that will improve the stability of the investment climate in the medium-long term.
- Government and ministry officials should improve their awareness of the international mining sector and current best practices.

6.3 **Tax.** The current tax system is internationally competitive but a delicately balanced package of various taxes. Adjustments to any part of the tax package could have an adverse impact on the mining sector and render Mongolia's tax regime non-competitive, unless the adjustment is compensated for in other taxes. Given that tax holidays can result in sub-optimal production practices (such as high grading prior to the end of the exemption period), a progressive shift away from tax holidays and other exemptions is warranted and should be offset by both a reduction in income tax rates to more competitive levels and the implementation of existing accelerated depreciation provisions. In particular:

- Placer royalty rate should be reduced to 2.5 percent in line with acceptable practice.
- Gold sales should be zero rated for VAT purposes.
- The government should not introduce the amendment to the Minerals Law to preclude exploration and development companies from registering for VAT.
- A portion of mineral royalties should be paid directly to local governments.
- Stability agreements and their associated conditions need to be negotiated with the aid of expert assistance, approved by cabinet and consistent for all mining companies.
- Reliable and detailed statistical information on tax collections from the mining sector should be collected.
- The corporate income tax law should include a loss carryover provision consistent with international best practices;
- The corporate income tax law should prescribe the tax treatment of exploration and development expenditures. These expenditures can be substantial, but the current law does not address the tax deductibility of these expenditures;
- Community and social related activities, and mine reclamation and closure costs should be regarded as normal operating expenditures and deductible in the corporate income tax purposes,
- The corporate income tax law should confirm the deductibility of mineral royalties in determining taxable income.

6.4 Legal and Regulatory Framework:

- The government should introduce regulations, rules, and procedures rather than amending the Minerals Law to govern local government and land-user permissions and contracts,

governors' approvals of environmental submissions, the form and content of reports related to exploration and mining license obligations, initial feasibility study requirements, and notifications and enforcement of sanctions for license violations.

- Mongolia creates a Mineral Sector Management Task Force of senior representatives of related ministries, reporting to the Minister of Industry and Trade, to strengthen the ability of the regulatory authorities to regulate, monitor, inspect, and enforce mining and tax legislation. It should improve collection of reliable and detailed statistical information from producing mines; reopen the closed exploration license areas now registered to Office of Geology.

6.5 Artisanal Mining

- Establish broad-based consultation with key stakeholders in the design of new policies and approaches that are inclusive and involve those who are directly impacted by its design, evaluation, and implementation. It should be based on a vision that reflects both immediate needs for better field organization and safer practices and longer-term possibilities for strengthening its contribution to the development of more sustainable communities and rural economies.
- Approval of the proposed artisanal law should be deferred, pending baseline studies, extensive public consultation, and reconsideration and review of all options.
- Environmental protection and rehabilitation in areas of artisanal mining should be enhanced. The new artisanal mining law should include appropriate and enforceable procedures and regulations relating to environmental management and more responsible mining practices.
- Child labor should be progressively eliminated with an immediate emphasis on removing the youngest children.
- Mercury use should not be banned. An educational program and a demonstration project should be implemented to introduce changes in the handling of mercury.
- Strengthen and support the Mine Rescue Service in implementing its mandate and focus on artisanal mining, industrial health and safety.
- Conduct an institutional needs assessment across agencies at the central and local levels to design and implement policies, laws and regulations relating to artisanal mining; and ameliorate deficiencies

ANNEXES

ANNEX 1. CURRENT MINING OPERATIONS

1. Although there are over 140 registered mining projects in Mongolia, the sector is dominated by the Erdenet copper/molybdenum mine, the fluor spar mines of Mongolrostsvetmet, and the top five placer gold mining companies, accounting for 81 percent⁴⁵ of the sector's output in 2001. Copper, molybdenum, fluor spar and placer gold account for 99 percent of output with the remainder coming from small tungsten and industrial mineral operations.

ERDENET COPPER MINE

2. The Erdenet copper-molybdenum mine is Mongolia's largest and has been in operation since 1978. The Erdenet Mining Corporation, a Russian-Mongolian state-controlled joint venture company, was formed in 1973 through an intergovernmental agreement that allowed for joint development and operation of the mine. The term of the joint venture agreement expired in early 2003 and has been extended until July 1, 2003. It is currently the subject of intense negotiation between the two governments.

3. Erdenet is a stock work-type Cu-Mo porphyry deposit located within a large intrusive porphyry system where four ore-bearing stock work zones have been identified; Erdenet Oboo (South-west), Central, Oyutyn Uul⁴⁶ and Turmaline. The mine, employing over 6,000 people, operates a conventional open pit (1.5 km by 2.5km) on the southwest ore body, where proven mineable reserves are estimated to be 1.54 billion tons at 0.52 percent Cu (cut-off grade of 0.25 percent Cu).⁴⁷

4. The deposit is divided into three horizontal layers. The upper oxidized/leached zone has an average grade of 0.1 percent Cu, the zone of secondary enrichment, underlying it, characterized by chalcocite, bornite and covellite has a grade of 0.81 percent Cu and 0.17 percent Mo, while the primary ore, characterized by pyrite, chalcopyrite, and molybdenite has average grade of 0.5 percent Cu and 0.17 percent Mo. Mining is taking place at the interface between the enriched secondary sulfides and the primary ore. Ore is removed from the pit using 8-10m³ excavators and transported from the pit using trucks with loading capacities of 78–136 tons and taken to the processing plant on-site. Processing consists of crushing, grinding and flotation of the ore, and thickening, filtration and drying of the concentrates. Crushing takes place in three stages using cone and gyratory crushers and with a closed circuit at the third stage. Two-stage ball-mill grinding produces fine material for flotation that occurs initially in three stages (rough, cleaner, scavenger) and then a final differential flotation where the Cu concentrate is separated from the Mo. The concentrates produced at the mine are bagged and shipped by rail to Chinavia Darkhan City, 165kms to the southwest of the deposit. At current operating levels the deposit has a 30-year mine life with significant potential to discover additional satellite ore-bodies nearby. In 2002, 502,491 tons of copper concentrate (26.2 percent Cu conc. grade) and 3,046 tons of molybdenum concentrate (52 percent Mo conc. grade) were produced containing 131,705 tons of Cu metal and 1,590 tons of Mo metal. In addition, the adjacent Erdmin⁴⁸ SX-EW plant processes some of Erdenet's low-grade oxidized ore and has an annual capacity to produce 3,000 tons of electrolytic copper cathode.

5. As mining at Erdenet progresses into the primary sulfide zone, the head grades are expected to decline further from 0.61 percent in 2002 to the average of the ore reserve, i.e. 0.5 percent Cu. With a cut off-grade of 0.3 percent Cu, the metallurgical complex lower grade ore, in

⁴⁵ Erdenet (53 percent), Mongolrostsvetmet (7 percent), Placer Companies (Altan Dornod Mongolia, Shirjir Alt, Mongol Gazar, Gatsuurt, and Erdes Holding) 21 percent.

⁴⁶ The Oyutyn Uul deposit is held by Timur Mineral Mongolia Co. Ltd., a company in which Marc Rich, the metal trader who purchases concentrates from Erdenet, has a major shareholding.

⁴⁷ Using the UN Framework for Classification of Reserves/Resources

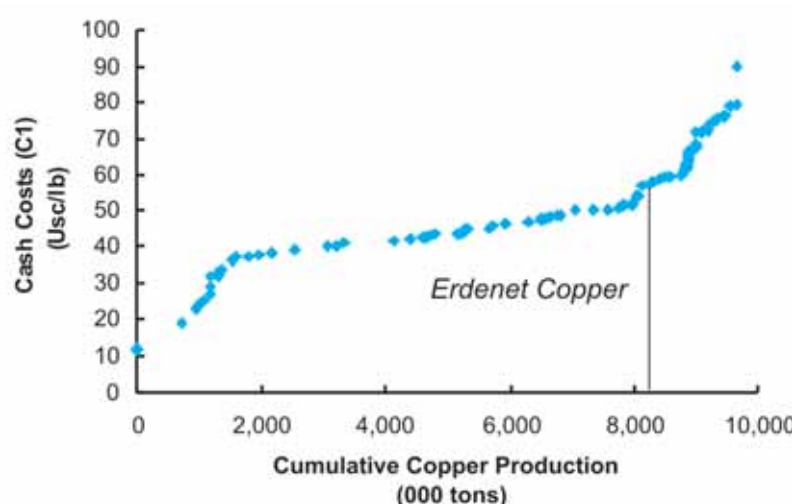
⁴⁸ A Mongolian (state-owned)/US (Strand Holdings Ltd.) joint venture

particular the clay-rich secondary sulfides, has been stockpiled for future processing. However, improvements made in the processing plant have resulted in increased Cu recovery and an ability to deal with some of the higher-grade clay-rich ore. A 10 percent improvement in the recovery of Mo is also being sought and a team of international metallurgical experts⁴⁹ is currently examining the options. In 2003, it is estimated that 24.9 million tons of ore will be mined and with recovery rates of 83 percent and 35 percent respectively (up from 82 percent and 30 percent in 2001), Erdenet will produce 484,614 tons of Cu concentrate, containing 26 percent Cu and 3,319 tons of Mo concentrate, containing 50 percent Mo.

6. Production accounts for 86 percent of costs (materials and spares 34 percent, fuel 2 percent, electricity 26 percent, salaries 11 percent) while transportation and finance charges are 6 percent and 1 percent respectively. As Erdenet is a state-owned organization and is essentially responsible for maintaining the economy of Mongolia's third largest city, the mine engages in a variety of non-mining activities such as farming, and also has an extensive social support program, which amounted to 5 percent of total costs in 2002.

7. Achieving a price of US\$300 and US\$3,103 per ton of Cu and Mo concentrate net of treatment and refining charges (TCRC), Erdenet recorded sales in 2002 of US\$163.1 million and pre-tax profit of US\$22.9 million.⁵⁰ Despite weak copper prices, the mine has been profitable since 1999 and has had a strong and positive cash flow for three of the last five years (although much of the cash is derived from forward sales of the bulk of mine production, which in turn significantly increases Erdenet's short-term liabilities). However, the mine has been a high-cost producer and relatively uncompetitive, utilizing outdated mining techniques and processing technologies.

Figure Annex I.1 Estimated World Copper Cost Curve, 2002



Source: Based on data from World Mine Cost Data Exchange Inc.

8. In 2002, the cost of production was 57 US\$/lb Cu while the average cost for global producers was 40 US\$/lb. Erdenet is located in the lower end of the upper quartile of the cost curve of world copper producers. In an effort to improve the performance of the mine, Erdenet is examining the feasibility of constructing a 20-25,000 ton solvent extraction, electro-winning (SX-EW) cathode copper plant at the mine, utilizing heap leaching technology to process the secondary sulfide ore.⁵¹ Positive initial test work in Australia in 2003 led the company to undertake a full feasibility study in 2004, with production expected to commence in 2005. Capital costs are

⁴⁹ Funded by the EBRD

⁵⁰ Source: Erdenet Financial Results. Exchange rate US\$1=Tg 1024

⁵¹ Containing Cu minerals chalcocite, covellite and bornite

estimated at US\$50-70M for this plant, which will be funded internally. In addition, the company plans to buy the remaining 51 percent of Erdmin SW-EW plant it does not own and use it for pilot test work. Concurrently with these studies, the company is examining the feasibility of further processing its Cu concentrates and producing 100,000 tons of copper-cathode using a US\$200m autoclave-hydrometallurgical plant. However, these studies are still in the early stages.

9. The company has examined the feasibility of using pressurized-leach and roasting technology to produce higher-value Mo-oxide (~70 percent Mo content)⁵² from its Mo concentrate, which would double the value of the current output. The company is negotiating with Outokumpu Oy to provide the appropriate technology, design the plant and possibly invest in the venture. Erdenet hopes to commence construction of this US\$20m plant in the latter part of 2003 with production beginning in 2005. In 2002 Erdenet examined the feasibility of building a smelter in Mongolia, which proved unviable due to a lack of concentrates to justify the project, a capital cost of US\$600-700M, and the existence of underutilized smelters in Northern China. The project has been abandoned.

ERDMIN SOLVENT EXTRACTION (SX-EW) PLANT

10. Constructed in 1995 to extract Cu from Erdenet's tailings dam and from stock piled low-grade oxide ore, the ERDMIN SX-EW plant has a capacity to produce 3,000 tons of Cu cathode per annum. However, recent production at the plant has been at ~50 percent of capacity (1471t in 2001) and the plant continues to be under-utilised. However, Erdenet plans to acquire 100 percent ownership of the operation and increase output. It also plans to use the plant for pilot-test work related to the feasibility of constructing a larger (20-25,000t) SX-EW plant on site.

FLUORSPAR MINING

11. Mongolia is a significant world producer of fluorite. With an annual production of over 500,000 tons of ore and 180,000 tons of concentrate (chemical and metallurgical grades) production, it ranks fourth behind China, Mexico and South Africa. Mongolia possesses twice the fluorspar reserves of China, yet only produces 6 percent of China's annual production. There are six fluorite mines in Mongolia, four of which are operated by Mongolroostvetmet accounting for 92 percent of the country's fluorspar production.

*Table Annex I.1: Fluorspar Mines with 2002 Production
(Mines operated by Mongolroostvetmet)*

Mine	Ore Conc. Prod. (tons)	Mine	Ore Conc. Prod. (tons)
Bor Undur*	121,260	Chuluut Tsagaan	9,290
Khajuu Ulaan*	24,180	Delgerkhaan, Berkh uul	5,538
Airag*	15,464	Urgen*	4,700

Source: MRAM

12. Mongolroostvetmet was established in 1974 under inter-governmental agreement and is a state-owned joint venture company between the Mongolian State Property Committee and the Russian Federation, represented by the Zarubejstmet. It is Mongolia's second largest mining company and also has interests in coal and placer gold mining projects (including 51 percent ownership of Shijir Alt.

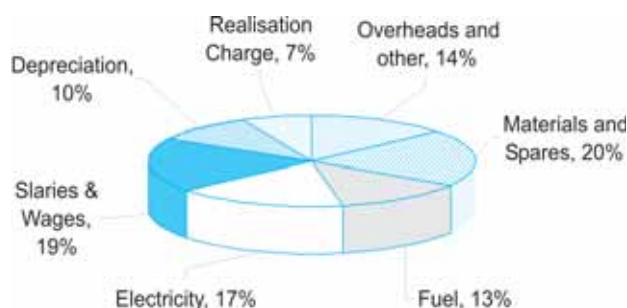
⁵² Also known as 'tech-oxide.'

13. The largest project is located at Bor-Undur where Mongolrostsvetmet has open pit and underground operations with production rates of approximately 225,000 and 115,000 tons of ore, which in 2002, produced 121,260 tons of concentrates (67 percent of Mongolian production). Bor-Undur is located 380km southeast of Ulaanbaatar in the Khentii aimag. The ore is hosted in fluoritised breccias (trachy-rhyolites) intruded as a series of dikes into fault-bounded Triassic granites. The breccias are typically high-angled vein-like mineralized zones composed of host rock breccias with fluorite and quartz-fluorite cement.

14. Ore is trucked to the ore-dressing and processing plant at the Bor-Under mine site which was built in 1985 and has a capacity to process 400,000 tons of ore. The ore undergoes primary crushing, after which it is hand sorted to produce a coarse, metallurgical grade fluorspar concentrate (75 percent F). The remaining ore goes through two further crushing stages and passed through a screen (2cm) where the oversize is concentrated using gravitation, producing further metallurgical grade concentrate, and the undersize (<2cm) undergoes a flotation process to produce chemical-grade concentrate (95 percent F) as powder or briquettes. Ore from the company's other open-pit operations (Khajuu Ulaan, Airag and Urgen) is hand-sorted (ore dressing on-site) and subsequently shipped to the Bor-Undur processing plant.

15. Mongolrostsvetmet produced 80,400 tons of metallurgical grade and 88,900 tons of chemical grade fluorspar concentrate in 2002, which was exported to Russia, Moldova, and Japan and to a lesser extent the EU. In 2002, the company received US\$75/ton of metallurgical grade and between US\$105-115/ton for chemical grade concentrate. Net profit for 2002, which includes some minor gold and coal interests, was US\$15.48 million or a margin 2.8 percent.

Annex Figure I.3 Mongolrostsvetmet Cost Structure



Source: Company Documents

16. In terms of future Mongolian fluorite production, it is expected that world prices for fluorspar have stabilized⁵³ and global demand is unlikely to grow substantially. Mongolrostsvetmet, which is currently underutilizing its production capacity of 250,000 tons/year, is exploring opportunities to sell to new markets. However, transportation costs of this bulk commodity have a major impact on exportation to countries outside Asia.

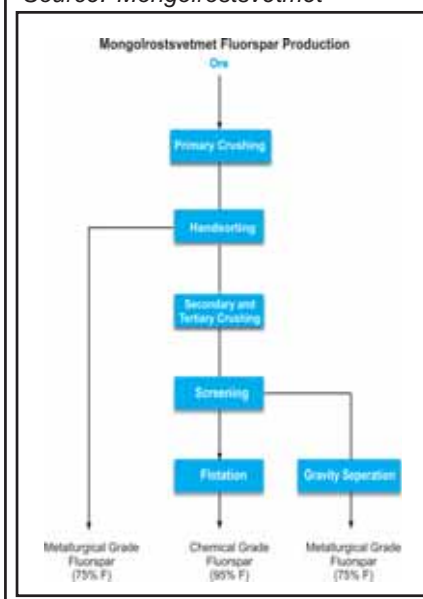
17. To compound matters, Japanese buyers require higher quality concentrates (chemical-grade 98 percent F, metallurgical-grade 80 percent) than the company is able to produce. Without significant investment in new processing facilities, annual production levels are therefore expected to remain static at around 110,000 tons of chemical-grade and 80,000 tons of metallurgical-grade concentrates⁵⁴ in the short to medium term.

⁵³ Mining Journal Annual Review, 2002

⁵⁴ Mongolrostsvetmet's production forecasts 2003-2007

Annex Figure I.2 Fluorspar Flow Sheet

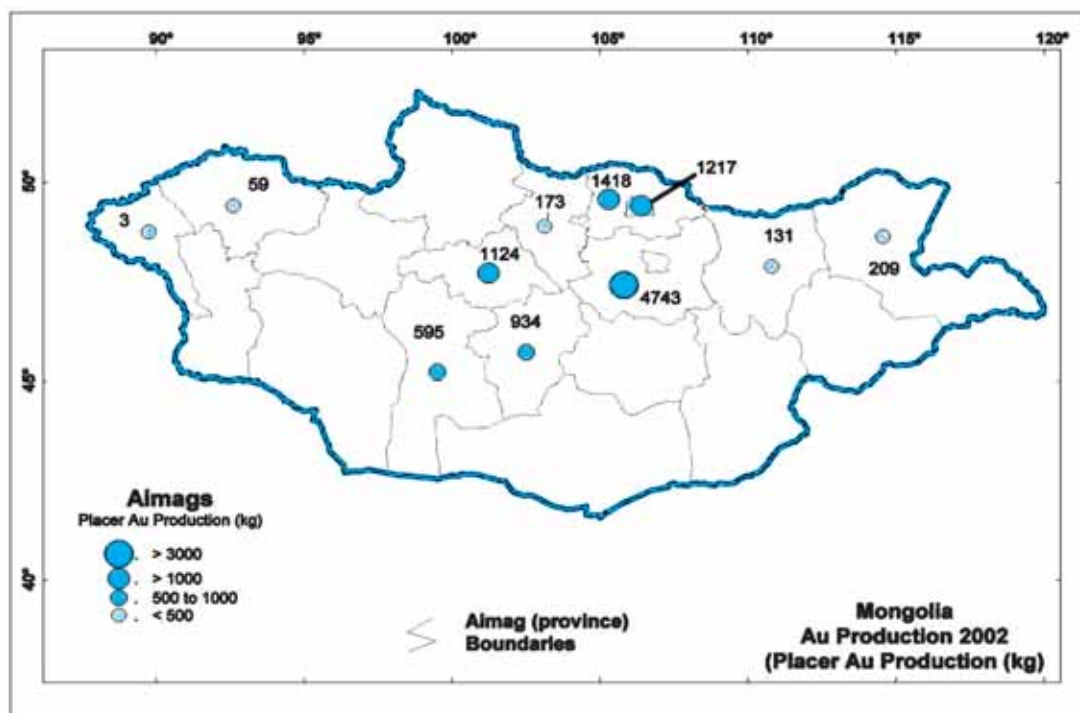
Source: Mongolrostsvetmet



PLACER GOLD MINING

18. Practically all recorded gold production in Mongolia comes from placer mines operated by Mongolian and Mongolia–Russian joint venture companies, although a very small number of hard-rock/supergene operations extract limited amounts of the metal. The majority of placer operations are focused on the Zaamar, Bayangol, Tolgoit and the North-Central goldfields. However, gold production is widespread throughout Mongolia.

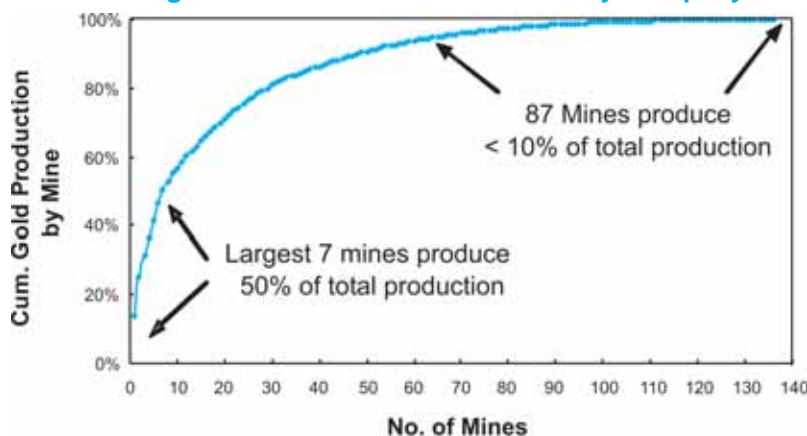
Annex Map I.1 Distribution of Placer Gold Production in Mongolia



19. The 2002 production of 10.7 tons is derived from 136 registered gold mines operating in 12 aimags. The size of operation varies widely with the largest 7 mines producing about half of the annual gold output, while 87 of the smaller mines produce less than 10 percent of the total... Over 40 percent of the production comes from the Tov aimag and a further 35 percent coming from the Selenge, Darkhan Uul, Arkhangai aimags.

20. The placer mines are located along current or paleo-river flood plains exploiting alluvial and colluvial placers by a variety of techniques, including large scale bucket-line dredges with on-board wash-plants and cable excavators, bulldozers and haulage trucks with static, semi-mobile or mobile wash-plants.

Annex Figure I.4 Placer Gold Production by Company 2002.



Source: MRAM, 2003

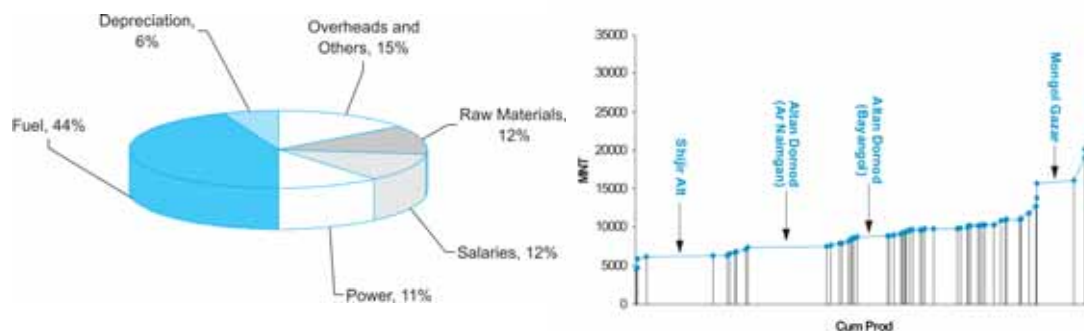
21. The Shiji Alt dredge used in Zaamar, cost US\$10 million and is a typical bucket-line dredge operation. The dredge has a displacement of 1,500 tons, and a maximum reach (depth) of 12m although the average operating depth is about 7m. It has 77 250-litre buckets on a chain, and a dredging design capacity of 1.2 million m³ a year. Mining ore at a grade of 0.65 g/m³, with a recovery of 90 percent, and a current operating capacity of 250 m³/hour, the dredge is operated all year-round and produces over 1,000 kg Au per year. Prior to dredging, overburden is stripped off by a Russian-made dragline with an 11m³ bucket and a long boom. Mining operations include the dredge, 2 water monitors and one scrubber. Gold recovery is by traditional Russian sluice boxes designed for continuous operation. Power is supplied by the electric grid. The mine employs about 500 people, including 50 Russians, comprising dredge crew, dragline, goldroom, and workshop personnel.

22. Other large-scale mines, such as those operated by Altan Dornod, are open pit operations where the placers and more recently, paleo-placers are being mined with bulldozers and excavators. The ore is stockpiled using wheel loaders and transported by truck to 200m³/hour capacity static wash-plants, which are available 22hr/day, 11 months of the year. Mining material with grades between 1-5 g/m³, the placers are typically mined from 5-40m depth and produce gold with high fineness (99.99 percent). For example in 2002 at the Ar naimgan mine, the company removed 7,009,700 m³ of overburden, processed 498,900 m³ of ore and produced 1455kg of gold (grade 2.92 g/m³). Capital costs for such mines are US\$5 million and costs in 2002 were US\$ 9.05 per gram of gold produced.

23. In general, the technology used by the larger placer operators in Mongolia is outdated, inefficient and costly. Many of the operating plants are based on Russian technology and equipment that is over thirty years old. This reflected in poor mining techniques, in poor recovery rates, and inadequate environmental rehabilitation. All the placer companies interviewed for this survey estimate that they recover 90 - 100 percent Au from their placers. This, however, cannot be the case given the large number of artisanal miners who extract gold from the tailings (Chapter 2). Further evidence of this also comes from Cold Gold, a small New Zealand placer operator, who has introduced a modern fully mobile screening plant with hydro-active riffled sluices and has profitably mined tailings and scavenged unwashed ore, averaging 0.5g/m³ from mine sites abandoned by other the large companies. The company now operates its own gold mine at break-even grades as low as 0.3g/m³ Au. Its technology permits a much higher gold recovery, continuous gold washing, concurrent rehabilitation of mined-out areas, reduction of truck movements and efficient use of manpower, all of which maximizes output and minimizes costs and environmental impacts. This type of technology could and should become more popular in Mongolia, once the sub-sector fully realizes the benefits.

24. Analysis of the cost structure of the placer mines is difficult using officially held data. While production data appears to be accurate for each of the placer operations, some of the companies who filed reports with the MRAM did not supply cost breakdowns or unit cost figures. However, using the available data, it can be seen that costs vary throughout the industry but fuel, salaries, raw materials and power consistently make up the principal cost items for the largest placer producers. Analysis of the cost curve shows a wide variety of unit costs with approximately 60 percent of production at a unit cost less than 10,000 MNT and 12 percent at a unit cost higher than the average gold spot price for 2002 (MNT 11,260).

Annex Figure I.5 Placer Mines Cost Structure and Cost Curve



Source: MRAM

Source: MRAM

25. Statistical analysis of the production data from 2000-2002 demonstrates a notable decrease in gold output (-11 percent), pointing to structural changes in the placer mining industry. The large, high-grade deposits initially exploited by placer miners over the last twenty years are being depleted. Smaller mines are being exploited: the number of mines is increasing while mean production per mine is decreasing and unit costs are increasing while ore grades are decreasing.

26. Although many of the larger producers are beginning to engage in active exploration for future placer reserves, this activity is a relatively recent phenomenon. Analysis of current mineral reserves at the largest placer mines, accounting for 70 percent of the total production, shows that at current extraction rates, they will be substantially depleted by 2010 unless reserves are systematically augmented through active exploration.

Table Annex I.2: Placer Production Statistics, 2000-02

	2002	2001	2000
Gold Production (kg)	10,712	12,092	11,312
Number of Mines	136	123	87
Mean Production (kg)	81	98	130
1st Quartile production	8,973	10,745	10,513
2 nd Quartile production	10,251	11,773	11,242

Source: MRAM

27. While the 2002 production figures may mark the beginning of a decline in placer gold production, a phenomenon recognized by the Mining Policy Document, gold production in Mongolia is set to increase from next year with the commissioning of the Boroo hard-rock gold mine (expected annual production of 5,800kg Au). It is also likely, given the wave of exploration activity in Mongolia that other hard-rock gold deposits will come on-stream in the near to medium-term.

OTHER MINING ACTIVITIES

28. In addition to the mining activities listed above, Mongolia also has officially (i.e. operations that register their production) 14 coal mines, one tungsten mine, one salt mine, and a large number of small clay, lime and aggregate quarries; however, production from the latter three is not significant in terms of gross industrial output.

Table Annex I.3 Other Mining Activities

Mineral	Number of Mines	2002 Production (tons unless stated)
Tungsten	1	51
Salt	1	392*
Clay for bricks	13	105,000 m3
Lime	11	206,300
Sand and gravel	19	273,500 m3

Source: MRAM

29. In the informal sector, there are numerous artisanal and small-scale placer and hard-rock miners who extract, in order of importance: gold, coal, fluor spar, mercury, precious stones and semi-precious stones, salt, gypsum, limestone, chert, brick clay, sand, and aggregates. The number of artisanal miners, who can make their living from scavenging around current operations, is expected to decline in line with the decline in the placer gold production.

NEW MINES UNDER DEVELOPMENT

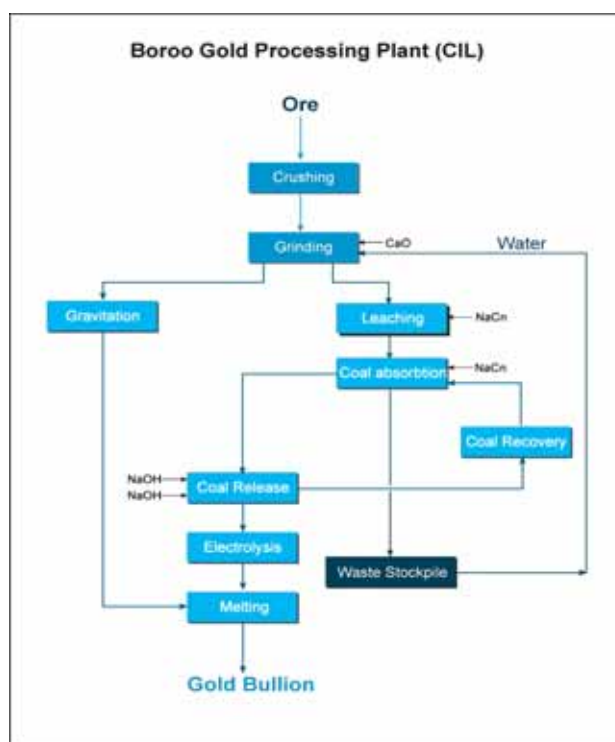
30. Mongolia currently has a number of mines under development. Gold mines at Boroo, Bumbat and Ovol Ovoot are due to become fully operational in 2004 and the zinc mine at Tumurtiin is scheduled to begin production in 2005. The Government's objective to bring deposits such as Surven-Sukhait (Cu/Mo), Tsunheeg (W), Asgat (Ag), Burenhaan (P), Selenge (Fe) and Mardai (U) into production may prove to be more difficult given the size of the deposits and the strong preference of international mining investors to explore and develop the more interesting gold, copper and zinc projects.

BOROO GOLD MINE

31. The Boroo Gold Mine, owned and operated by Boroo Gold Company XXK (a member of the Cameco group of companies) is a medium sized deposit containing one million ounces of gold and located 110km north west of Ulaanbaatar. Construction of the mine began in 2002 and production is due to commenced in December 2003.⁵⁶

32. Current proven mineral reserves are 9.402 million tons at a grade of 3.68 g/t, with potential to discover additional reserves. With a planned life of 6 years, the mine will be based around three small open pits, with an average depth of 60-80 meters. Ore will be mined using conventional drill, blast and truck/loader operations. Once extracted, the ore will be transported by trucks to a 5,000 ton per day nominal capacity, gravitation and carbon-in-leach processing plant, which will produce gold bullion on site.

Annex Figure I.6 Boroo Gold Flow Sheet

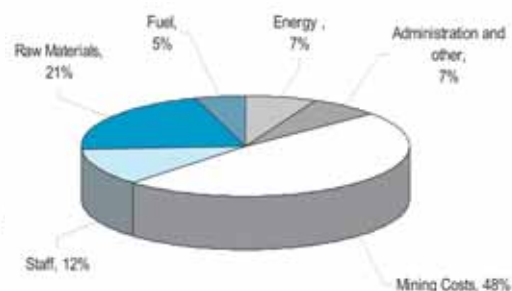


⁵⁶ Expected production in 2004 is 210,000 ozs.

33. The gold mineralization occurs in quartz veins within the granite host rock and can be traced 700m along strike and up to 300m down d own-dip. The ore is oxidized to a depth of 40m.

34. The mine will employ about 350 personnel including 35 expatriates. At present 350 people are involved in the construction of the mine. In addition, a number of local SMEs are being contracted by the mine to supply various products and services needed during the construction and mining phases (maintenance, haulage, catering, lime supply from an existing local quarry and transportation). In an attempt to employ as many local people as possible, Boroo Gold has established a training center in the nearby town of Baruunkharaa, where recruitment and training of mine staff is currently taking place.

Annex Figure I.7 Borro Gold Ltd Cost Structure (% total costs).



Source: Company Documents

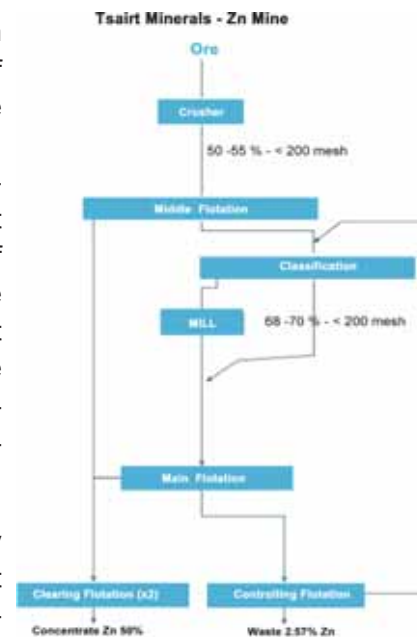
35. The mine is connected to the main Ulaanbaatar–Darkhan highway via a 10km mine road, is located 3kms from existing high-tension power lines, 12km from the nearest plentiful source of water and is 35 road kilometers from the town of Baruunkharaa, which has a railway station. Approximately 500 artisanal miners work in the vicinity of the mine, exploiting hard rock deposits.

TUMURTIIN ZINC MINE

36. Located in the Sukbataar aimag, the Tumurtiin Zn deposit is a 7.5M ton skarn ore body with average grade of 13.67 percent Zn. Operated by Tsairt Minerals, a Chinese 51 percent, Mongolian 49 percent joint venture company, the mine is due to become operational in 2005, with construction beginning in June 2003 and shipment of the first concentrate in the summer of 2005. Mining 300,000 tons of ore per year, Tsairt Minerals will operate an open-pit mine with a stripping ratio of 1:6, a head grade of 13.19 percent and a Zn recovery rate of 87 percent. The mine will produce an average of 69,000 tons of zinc concentrate over the 14-year mine life. The average Zn metal content in the concentrate will be 50 percent.

37. The deposit is in the form of a lenticular, steeply dipping, sphalerite ore body (with associated lenses) that has a length of 800m, and average width of 215m, a thickness of 14m and extends to 480m depths. The upper 60 m of the ore body is oxidized.

Annex Figure I.8 Tumurtiin Flow Sheet.



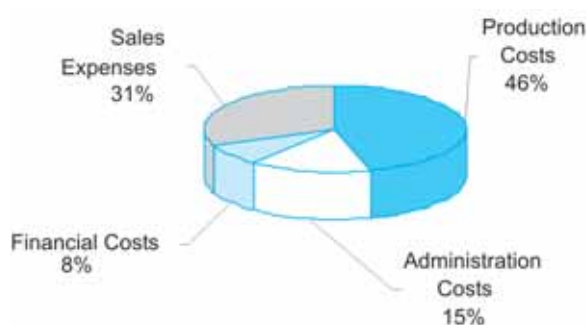
38. The company is assessing two options for transporting the concentrate, either by truck 360kms to the railway station at Sainshand to the southwest and from there by railway to smelters in China, or by truck to China through the border crossings directly south of the mine.⁵⁷ Tsairt Minerals have already established sales contracts with two smelters in China and are expecting to achieve US\$190-200 per ton of concentrate (excluding smelter charges).⁵⁸

⁵⁷ The latter option is cheaper but Mongolia's border crossings with China to the south of Tumurtiin are only open on a seasonal basis at present.

⁵⁸ Personal Communication. Tsairt Company Director.

39. However the company is planning to bring the operation on-stream at a time when Zn prices are historically low. The current market price for Zinc suggests that Tumurtiin concentrate would achieve a price closer to US\$170 per ton,⁵⁹ although this largely depends on the TCRCs the company can negotiate with Chinese smelters. The average operating cost structure of the mine is shown in Figure 2.17 and projected to be US\$140 per ton of concentrate. The mine will have a capital cost of US\$38 million, a portion of which will be funded by the China Import Export Bank and the Shanghai Stock Exchange.

Annex Figure I.9 Tumurtiin Cost Structure
(%total costs)



Source: Company Documents

40. Over 700 people, mainly Chinese nationals will be used to construct the mine. Approximately 400, 85 percent of which will be Mongolian, will be employed once the mine begins production. As payments to non-residents of Mongolia are subject generally to 20 percent withholding tax, the cost of construction of the mine will be raised considerably (Chapter 3.).

41. Tsairt Minerals have been actively trying to encourage local SME involvement through outsourcing a variety of support services but have had limited success. While the company will source most of their consumable goods within Mongolia, much of the material use in the construction and operation of the mine will be imported from China due to price advantages.

42. In addition, Tsairt examined the feasibility of sourcing grinding balls from the steel mill at Darkhan city but preliminary tests revealed the balls to be too soft. Also, in a search for contractors to assist with the transportation of the concentrate by truck, the company found that, there are very few Mongolian haulage contractors in the region to serve the needs of the mine. It is therefore likely that a Chinese–Mongolian JV Company will do trucking. Clearly opportunities are being missed for local SMEs to supply goods and services.

BUMBAT GOLD MINE

43. Originally held by Mongolyn Alt Corporation (MAK) and Tyhee Development Corp. (Canadian), the Bumbat gold mine had commenced operations in 1997 but ceased a year later with the introduction of the 10 percent Gold Tax. MAK however, now 100 percent owners⁶⁰ of the mine, are planning to resume mining in 2003/04, with an initial production 200-300 kg Au.

44. Bumbat was discovered by a joint Mongolian-Russian geological expedition in 1982 and comprises over 150 quartz veins of which seven are estimated to be economic. The deposit has estimated gold reserves (C1 & C2 according to the UN classification of ore reserves (Annex VIII) of 10 tons Au with a cut-off grade of 3.0 g/t, hosted in a series of steeply dipping quartz-veins (60) which will be exploited by a series of shallow open-pits 300-400m wide and 250m deep. Mining in 1997 extracted 20,600 metric tons of ore from vein '118'. Preliminary stripping at veins 115 and 56 was also completed.

⁵⁹ The current spot price for SHG (Special High Grade) Zn metal is US\$763 (May 2003). At current prices relatively clean concentrate with 50 percent Zn metal content, 85 percent smelter recovery and a smelter charge of US\$150 would imply a price of US\$170 /ton concentrate (May 2003).

⁶⁰ MAK agreed to pay US\$600,000 for 100 percent of Tyhee's interest in Bumbat as follows: US\$350,000 upon signing the Sale and Purchase Agreement, and US\$125,000 on or before June 30, 2003, and US\$125,000 on or before June 30, 2004.

45. Mining will recommence in 2003/04 on these veins at a rate of 500 tpd. Initially, processing will be undertaken in the existing gravity separation plant that has a capacity of 200-250 ton/day. The process involves two stage crushing, two stage close circuit grinding (rod & ball mills), a 21' Falcon Concentrator for recovering coarse and free gold, a shaking table for upgrading gravity concentrate and finally, flotation cells.

46. In order to improve recovery rates and upgrade the capacity of the plant, MAK will enter into a Technical Services Agreement with the China National Gold Corporation to assist them with the plant's renovation and expansion to a combined gravity / cyanidisation plant. With the installation of a Carbon-In-Pulp process, plant recovery is expected to rise to 95 percent and total production is expected to reach 700kg Au by 2004.

47. The mine is located 210 km west of Ulaanbaatar, in the Tuv aimag and already has an established infrastructure (water, power, transportation) from previous mining operations.

OLON OVOOT GOLD DEPOSIT

48. Also due to start production in 2003/04, the Olon Ovoot gold deposit, 100 percent owned by Mongol Gazar, was initially discovered in 1994 through government-sponsored reconnaissance and then further investigated by JICA⁶¹ who outlined a significant area of mineralization (1,173 kg Au) using drilling, geophysical and geochemical exploration. Mongol Gazar acquired control of the deposit in 2001 and since then has reportedly spent US\$ 0.5 million conducting further exploration on the deposit.

49. Olon Ovoot is hosted in volcanic rocks (diorites, rhyolites and andesites), with mineralization found in a stockwork vein system along shear structures within the altered volcanic package. Free gold is also located in the wall rocks. The mineralized belt, to date, has been traced for 16km along strike and has an average thickness of 20m.

50. At present, Olon Ovoot has been drilled to 100m and is open at depth. Mining will be by open-pit and with a stripping ratio of 1:1.2, ore will be processed initially at a rate of 300 tons per day. Reserves to date have been estimated 580,000 tons @ 15 g/t Au or 8.68 tons (270,000 oz) Au. Additional resources are estimated to be 50 tons of gold.⁶² Over 80 percent of the gold ore is free-milling, with an 80 percent recovery rate and with an operating cost of US\$1.5 per gram for the first three years of operation. Refractory ore (20 percent) will be stockpiled for future processing.

51. Mongol Gazar estimate that production in 2003 will reached 1.2 tons of Au and steadily increase to 5 tons of gold per/annum by 2005. The initial capital cost of the mine will be US\$6m but the company also plans to lease equipment from the international mineral processing company, Metso Mineral Systems, who completed the feasibility study of the deposit.

52. The deposit is located 550km from Ulaanbaatar and 100km from Dalanzadgad, the capital of the Omno Govi aimag and 40km from the town of Byan Khoshuu. The mine is accessible by dirt-road and power will be supplied by a diesel generator to be constructed on-site. The company has undertaken hydro-geological drilling and confirmed the presence of sufficient water for the operation. 150 people will be employed at the mine, the vast majority of whom will be Mongolian.

⁶¹ Japanese International Cooperation Agency.

⁶² Personal Communication Mongol Gazar, Managing Director.

INTERESTING EXPLORATION PROSPECTS

53. In addition to the operational and planned mines, Mongolia has a number of interesting prospects, which have largely been discovered through the recent increase in exploration activity. Although none of the prospects described below are due to come into production in the short-term, they are significant and could play an important role in the growth of the sector and economy of Mongolia in the longer-term.

OYU TOLGOI (TURQUOISE HILL) COPPER/GOLD PROSPECT

54. In terms of size and importance, the Oyu Tolgoi gold, copper and molybdenum prospect is the most significant mineral discovery made in Mongolia since independence. Originally held by BHP in 1996, Ivanhoe Mines signed an option to earn 100 percent interest in 2000 and now holds a 100 percent interest in the project, subject to BHP Billiton's 2 percent Net Smelter Return royalty. Ivanhoe Mines is a Canadian copper and iron mining company that have mining and exploration interests throughout Australasia. It currently holds exploration licenses covering approximately 90,000 square kilometers in central and southern Mongolia.

55. Oyu Tolgoi is located in the south Gobi Desert of Mongolia, approximately 560 km due south of Ulaanbaatar. The deposit is typical copper/gold porphyry and has inferred resources of some 1.04 billion tonnes, grading 0.95 percent Cu and 0.26 g/t Au at a 0.6 percent Cu equivalent cut-off and contains 21.8 billion pounds of copper and 7.8 million oz of gold⁶³ (see UN ore classification of mineral resources in Annex VIII). It is open along both strike and at depth. Recent drilling has confirmed a new high-grade extension of the ore body to the north which has significantly increased the level of indicated resources

56. Four major ore-bodies have been identified at Oyu Tolgoi occurring along a NE/SW trend over a 5km strike length and comprise South Oyu, Southwest Oyu, Central Oyu and Far North Oyu. The Southern most ore-bodies (South & Southwest Oyu) are joined and have a pipe-like geometry extending 250m in diameter, and at 0.5 percent Cu equivalent cut-off, extend from about 50m below the surface to 1km in depth. Southwest Oyu zone is a gold-rich porphyry system, consisting of finely disseminated pyrite-chalcopryrite and minor bornite with a gold rich core that has the highest gold content of the four ore bodies (0.6 g/t). South Oyu is a copper porphyry deposit and consists of finely disseminated pyrite-chalcopryrite and bornite with little gold.

Table Annex I.4: Oyu Tolgoi - Summary of Mineral Resources (as of Nov 2003)
(Using the UN Framework for Classification of Reserves/Resources)

Orebody	Mineral Resources @ cut-off of 0.6% Cu equivalent.			Mineral Resources @ cut-off of 1% Cu equivalent		
	Reserves	Grade		Reserves	Grade	
	(Tons)	Cu (%)	Au (g/t)	(Tons)	Cu (%)	Au (g/t)
Indicated						
South West Oyu	267,000,000	0.53	0.86	92,300,000	0.74	1.57
Inferred						
South West Oyu	126,600,000	0.44	0.68	24,900,000	0.59	1.40
South Oyu	48,400,000	0.61	0.26	5,400,000	0.82	0.56
Central Oyu	147,500,000	0.84	0.24	60,600,000	1.12	0.34
Far North Oyu	961,600,000	0.86	0.12	575,500,000	1.67	0.23
Total	1,284,100,000	1.13	0.24	666,400,000	1.57	0.29

Source: AMEC Technical Report – Preliminary Assessment, January 2004

⁶³ AMEC Technical Report – Preliminary Assessment, January 2004

57. The central ore body has three ore zones. An enriched chalcocite, Cu-oxide blanket grading 0.75 percent Cu is 20m to 35m thick and occurs at depths varying from near surface to -100m. It has an aerial extent of 1300m by 600m and is underlain by a less extensive covellite zone (secondary sulfides), 600m by 230m in area and up to 325m thick, extending to a depth of ~450m. A zone of primary sulfides (chalcopyrite) and Au mineralization is found underneath the covellite, and is similar in aerial extent. At a cutoff of 0.5 percent Cu equivalent, this has been drilled to a depth of ~750m, where the mineralized zone is open but appears to be tapering off.

58. Far North Oyu is the ore body most recently investigated and is a deep elongated zone, 1,800m by 200m in area, some 200m below the surface. Work to date has identified chalcopyrite, bornite and minor amounts of Au mineralization, with some significant high-grade intersections in the most recent drillholes (164m of 4.00 percent Cu and 1.42 g/t Au)⁶⁴. It is a high-sulfidation ore body containing chalcopyrite, bornite, chalcocite and pyrite and contains a high-grade copper zone, with a 2 percent Cu cut-off.

59. Although the Oyu Tolgoi deposit represents a very significant ore body and is the subject of extensive and continuous exploration by Ivanhoe Mines⁶⁵, it may take another 5-10 years to develop a mine at the site due to lack of available infrastructure. Copper concentrates from the mine will most likely be sold to Chinese smelters. While the deposit has dirt-road access, a landing strip to accommodate small aircraft and is located only 80km north from the Chinese border, it is 360 km east of the main railway line between Ulaanbaatar and China. However, Ivanhoe are attempting to facilitate discussions with the Chinese and Mongolian governments that would lead to the construction of a 290-kilometre rail line linking Oyu Tolgoi to the Chinese city of Bayan Obo, which is connected to the Chinese national rail network⁶⁶. To compound matters, the nearest significant power generator is at Tavan Tolgoi 200kms to the west and the water resources necessary to operate a porphyry Cu-Au deposit of the size envisaged at Oyu Tolgoi will need to be pumped from the Galbyn Gobi and Gunii Hooloi aquifers some 70 km from the site.⁶⁷

60. Ivanhoe Mines spent US\$8 million on exploration in Mongolia in 2002, making it the largest exploration company in the country. The company raised US\$50.7 million in private-placement financing in April 2003 and the proceeds will be used to advance ongoing resource-definition drilling, development planning and feasibility studies at Oyu Tolgoi.

GATSUURT GOLD PROSPECT

61. Held 40 percent by Cameco and 60 percent by AGR (which is 56 percent owned by Cameco) and located 35 km to the east-southeast of the company's Boroo gold mine, the Gatsuurt gold deposit is currently undergoing reserves definition drilling and metallurgical studies which will likely confirm a geological gold resource similar in size and grade to Boroo. The deposit is in a similar geological setting as Boroo – mineralized granitoids hosted in NE-SW shear zones with Au-bearing sulfides. The main difference is that Gatsuurt is vertically oriented, and has been drilled locally to 200 m depth.

⁶⁴ Drill Hole 367A. Source: Ivanhoe Press Release, March 31st 2003.

⁶⁵ Ivanhoe's 2002 exploration budget in Mongolia was US\$8 million, or 44 percent of Mongolia's total exploration expenditure.

⁶⁶ Ivanhoe has recently announced the formation of a strategic alliance with the China International Trust & Investment Corporation (CITIC) to develop base and precious metals projects in the region, to help meet China's current and future metals requirements. Ivanhoe Press Release April 23, 2003.

⁶⁷ The company is undertaking hydro geological studies to secure appropriate ground-water resources over the life of the operation.

62. The oxidized and transitional (oxide/sulphide) ore can be processed using the gravitational/conventional cyanide-CIL processing plant at Boroo; however, there is also a significant amount of variably refractory sulfides that would require oxidation to achieve high recoveries. Cameco therefore is considering several options for mine development including shipping the oxide and transitional ores directly to the Boroo plant for processing, or setting up a stand-alone operation to process all ore types.

GOLDEN HILLS GOLD PROSPECT

63. Held by QGX, a Canadian junior, who is currently earning an 80 percent interest in the project from a Mongolian company, the Golden Hills prospect comprises a series of Au-bearing sulfide lenses / gossans, hosted in a package of intermediate felsic meta-volcanic / sedimentary rocks of Proterozoic age. Located in western Mongolia in the Zavkhan Aimag, close to the town of Uliastay, the Golden Hills prospect has been identified along a 7km strike length by ground geophysics and to date the 'Central Valley Zone' has been drilled. Sulfide lenses with widths of 10-40 metres and gold grades of 0.2 -0.4 g/t Au have been intersected over a 1.5km strike length⁶⁸. Oxidization of the mineralized zones, where gold grades are significantly higher (2-4 g/t Au), occurs to a depth of 80m.

SURVEN-SUKHAIT COPPER / MOLYBDENUM PROSPECT

64. This is a copper/molybdenum deposit, located 164 km southwest of the Zuun-Bayan railroad station, in the Dornogovi aimag in southeast Mongolia. It is one of seven porphyry copper-molybdenum occurrences within the Tsagaan-Suvargiin district. Overall, the copper-molybdenum mineralization occurs within an extensive late Devonian-early Carboniferous intrusive syenite massive. Although the seven mineralized areas have been studied, the Surven-Sukhait deposit is considered to have the greatest economic potential. Held by Mongolyn-Alt Corporation (MAK) who are currently seeking financing partners to develop the deposit, commercial ore reserves of the deposit have been estimated at well over 220 million tons at 0.54 percent copper, 0.019 percent molybdenum with minor gold and silver.

PROJECTED OPERATING PERFORMANCE AND MODEL ASSUMPTIONS

65. To assess the financial and economic impact of the sector, a detailed review of the prospects and potential performance of these operations was undertaken. The assumptions inherent in the base case projection and alternative scenarios were based on the geological and technical characteristics of each mine or mineral prospect; price distributions for the main commodities of copper, gold and zinc; cashflow probabilities; and the correlation between them. These individual production and financial projections were then consolidated to produce aggregate output and growth estimates for the sector, which formed the basis for a macro economic assessment of the sector's potential impact on the economy.

These geological and technical assumptions include:

Operating Mines and Metallurgical Plants

66. Erdenet: The model predicts continued exploitation of the southwest ore body at current rates (approximately 25 million tons per year) but at gradually decreasing ore-grades, 0.61

⁶⁸ Intersections have included: 1.4 g/t gold over 40 m (22.5-66.5 m) in Hole CVZ-022 and 7.9 g/t gold over 7.7 m (61.4-69.0 m) in Hole CVZ-015. Source: QGX Press Release April 2003.

percent Cu in 2003 down to 0.55 percent in 2010. This decrease in ore grade will initially be offset by increased Cu recovery rates (up from the current 83.47 percent to 85 percent in 2005) and will result in an annual production of 484,000 tons of Cu concentrate in 2003, increasing to 500,000 tons in 2005 and thereafter decreasing steadily (in line with decline in grade) to 450,000 tons in 2010. Mo concentrate production will increase to 3898 tons in 2004 and thereafter remain constant. The mine will continue to employ around 6,000 people and the cost structure is expected to remain static.

67. Erdmin: Predicted to continued operation in 2003 at current production levels, 1,500 tons of copper cathode, with an increase to 3,000 from 2004 onwards, when the plant will be initially used as a large-scale pilot plant for the planned 25,000 tons SX-EW copper cathode plant at Erdenet and thereafter operated at its rated capacity of 3,000 tons per annum.

68. Fluorspar Production: Production from Mongolrostsvetmet's fluorite operations is expected to remain steady (between 415,000 – 450,000 tons of ore per annum) given the static global market conditions and commodity prices (US\$70/ton metallurgical grade fluorspar and US\$110 for chemical grade fluorspar). In line with company expectations, the level of chemical-grade fluorspar production will increase from 88,900 tons in 2002 to 111,000 tons in 2005, while metallurgical grade production will reduce slightly, steadying to 76,500 tons per annum in 2005.

69. Placer Gold Mines: As alluded to in Section 2.3.4, the nature of the placer mining industry in Mongolia is changing. The large, high-grade deposits have largely being depleted and there is little evidence that placer mining companies are exploring for and discovering new reserves at rates that match current production levels. Using information gathered from MRAM and company reports from 20 percent of placer mining companies that account for 70 percent of current production, it is estimated that placer production in Mongolia will decrease steadily over of the next 10 years unless, the placer mining companies dramatically increase the level of exploration activity to find additional reserves.

**Table Annex1.5 Projected Production of Largest Placer Gold Mines (top 70 percent)
2002-2010**

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Production (kg)	7,350	6,952	6,327	5,993	4,569	4,421	3,968	2,652	1,416
% of 2002 Prod	100%	95%	86%	82%	62%	60%	54%	36%	19%

Source: MRAM

70. The projections used in the base case scenario are calculated using the actual figures for each of the producers accounting for 70 percent of total industry output, while the remaining 30 percent from scores of producers is extrapolated from this data.

71. Other Mines: The smaller producing mines (tungsten, aggregates, clay, etc.) are not expected to have a noticeable impact on the growth of the sector and therefore have not been included in the base case scenario.

Developing Mines/Plant⁶⁹

72. Boroo Gold Mine: The Boroo Gold Mine, containing one million ounces of gold is currently under construction and commenced production in the December 2004, and is expected to reach full production of 5,800kg Au per annum in 2005. Current proven mineral reserves are

⁶⁹ While the mining companies involved in the Bumbat and Olon Ovoot projects stated that production would commence in 2003, neither of these mines is included in the base case scenario as the level of detailed information available on both projects is minimal and there is some doubt that the production levels forecast will actually be met. Neither of these mine developments has been included in the model

9.402 million tons at a grade of 3.68 g/t. At a capital cost of US\$65million and operating cost of US\$200 per oz Au, the mine will employ 350 people. The mine currently has a mine life of 6 years, based around three small open pits but there is potential to discover additional reserves. However, as this fact has yet to be established, the model records the mine closure at the end of 2009.

73. Tumurtiin Zinc Mine: The Tumurtiin Zn deposit is a 7.5 million ton ore body with average grade of 13.67percent Zn. The mine is planned to become operational in 2005, with construction beginning in June 2003 and shipment of the first concentrate in the summer of 2005. Mining 300,000 tons of ore per year, the open-pit mine is expected to produce an average of 69,000 tons of zinc concentrate per annum over the 14 year mine life. The average Zn metal content in the concentrate will be 50percent. The model projects production to be 25,000 tons of Zn concentrate in 2005, rising to full production or ~77,000 tons in 2007. The mine will have a capital cost of US\$38M and an operating cost of US\$140 per ton of concentrate produced. Concentrates will be transported by rail and truck to smelters in China. Over 700 people, mainly Chinese nationals will be used to construct the mine. Approximately 400, 85 percent of which will be Mongolian, will be employed once the mine begins production. Projections indicate that this is a marginal prospect under current conditions, whose development depends on a recovery in the Zinc market and favorable processing arrangements from Chinese smelters. Accordingly its development is assigned a probability of 70 percent plus/minus 10 percent.

74. Erdenet Cu Cathode Plant: The model assumes the feasibility of constructing a 20-25,000 ton solvent extraction, electro-winning (SX-EW) cathode copper plant at Erdenet mine is positive and the plant is developed in 2004 and commissioned in 2005. The plant will produce 24,000 tons of copper cathodes at an estimated capital cost of US\$50m and operating cost of 40c/lb of copper produced. Plans to further process Erdenet copper concentrates by hyro-metallurgical means are regarded as premature, costly and technologically speculative, and consequently have been ignored for the purposes of these projections.

75. Erdenet Mo Oxide Processing Facility: In addition to the larger SX-EW Cu leach plant, the model also includes the proposed Mo oxide processing plant where pressurized-leach and roasting technology would be implemented to produce higher-value Mo-oxide (~70 percent Mo content)⁷⁰ from the existing Mo concentrate produced at the mine. This would result in the doubling the value of current output. The model predicts a construction of the US\$15m plant to being in the 2004 with production commencing in 2005. This will result in the production of a higher value Mo oxide (70 percent Mo) with capital cost of US\$20m and an additional process cost of 50c/lb of concentrate processed.

76. Bumbat Gold Mine: This is projected to come on-stream in 2004 initially using gravity separation with lower recovery rates producing 200kg Au and then increasing to a production level of ~700 kg Au per annum once the planned combined gravity / cyanidisation plant in completed and fully operational in 2006, with increasing recoveries from 90percent to 95 percent over the following three years. The cost of upgrading the existing gravity plant is set at US\$3m and operating costs are estimated to be US\$200 per oz.

77. Olon Ovoot Gold Prospect: Information gathered from the prospect's operators, estimate that the mine will be commissioned in 2003/04 and will steadily production to 5 tons of gold per annum by 2005. The initial capital cost of the mine will be US\$6m. However, given that the mine is on a green-field site, the operator has no previous experience of hard rock mining and current proven reserves stand at ~9 tons Au⁷¹, the model has applied more conservative produc

⁷⁰ Also known as 'tech-oxide'.

⁷¹ Although additional resources are estimated to be 50 tons Au.

tion levels of 500 tons in 2004, 1000 in 2005, 1500 in 2006 and 2000 tons from 2007 onwards. Ore is modeled at 15 g/t Au and recovery rates are 80percent. Operating costs are US\$250 per/oz. Given the uncertainty attached to this prospect, a low probability will be applied to it.

Grass Roots Exploration Prospects

78. Oyu Tolgoi: As this is by far, Mongolia's largest mining prospect, it has been added to the model, albeit at a 50 percent probability of development under current explorations results. It is assumed to come on-stream in 2007, commencing production in the Southwest ore body building up to an annual production rate of 660,000 tons of Cu concentrate (30 percent contained copper) and 22,700 kg gold.

79. The crude capital costs are estimated to be US\$500m (allowing for substantial use of (cheaper) Russian/Chinese/Mongolian plant and equipment). This is based on current estimates of a) fixed capital costs for typical western porphyry open-pit mine and concentrator projects are US\$1,000 and US\$2,000 per annual ton of Cu respectively and b) an assumed mine and concentrator output at Oyu Tolgoi of 200,000 tpa Cu contained.

80. The total crude Cu operating cost would be \$165M, equivalent to \$0.37/lb Cu. Costs of sales including transportation would increase this figure to around \$0.40/lb Cu. Adding the cost of treatment charges and refining costs (TC/RCs), equivalent to around \$0.10 and \$0.05/lb Cu respectively, provides a total cost of around \$0.55/lb Cu produced. Operating costs per oz of gold produced are estimated at US\$200.

81. Using published drilling results and ore resource estimations, it is assumed that this will be an open pit operation, designed to mine and process 39 million tons of ore per year and produce a copper concentrate with a grade of 30 percent Cu (~200,000 tpa Cu contained) and 22,766 kg of gold.

ANNEX 2. INDIRECT ECONOMIC IMPACTS OF MINING

Indirect Impacts on Growth

1. An increase in mining output can impact on economic growth indirectly through affecting production factors accumulation, total factor productivity growth or both. This indirect impact will result from the quantity and quality of fiscal expenditures (fiscal mechanism), the ability to acquire goods and services more efficiently produced abroad (trade mechanism), or the multiplier effects that expending income has in the economy (the income mechanism).

- *The Fiscal Mechanism.* Mining activities are taxed like any economic activity. Moreover, in addition to the ordinary taxes applied to economic activities such as the income tax, mining is usually burdened with royalties or other taxes due to the sovereignty of the state over mineral resources, the need to compensate society for minerals resources depletion or both. Thus, an increase in mining output increases also fiscal revenues. Further, a significant increase in mining production in a developing country dependent on mining, as will be discussed below, results in a major increase in exports that in turn leads to the expansion of imports. This causes an additional increase in fiscal revenues due to the duties paid for the increase in imports. For example, in six out of a sample of ten countries that experienced commodities related booms during 1976-78, the cumulative rise in imports was greater than the increase in exports.⁷² In a country like Mongolia, where fiscal revenues from mining and imports are significant, an important expansion of its mining output would result in a large increase in fiscal revenues.
- The additional fiscal revenues arising from the mining expansion can be used to increase public investment. For example, if health services and education are increased or improved, labor accumulates as well as poverty is reduced. In addition, fiscal revenues can be used for building infrastructure such as roads, for rural electrification and so on, increasing the economy's stock of capital. Indirectly, private investment can also increase if the additional fiscal revenues are used to reduce the domestic public debt, thereby crowding in the private sector in the financial markets. Even it is possible that productivity growth could take place, if the additional resources were used in such a way as to improve a country's intangible assets i.e., implementing reforms to enhance the judiciary system. In summary, well-managed fiscal revenues arising from a significant increase in mining output can result in production factors accumulation and productivity growth, hence in economic growth in the medium and long term.
- *The Trade Mechanism.* In small highly dependent mining economies like Mongolia, a large expansion in mining production results in a significant enlargement of exports as mineral and metals are largely sold in international markets. The increase in exports provides additional foreign currency to increase imports of good and services required for increasing in quantity and quality⁷³ man-made capital. This expansion in exports and in the economy's capital stock usually will take place through an appreciation of the exchange rate, which, if moderated, will not harm the international competitiveness of the agriculture and manufacturing industry. An increase in foreign currency will also facilitate the acquisition of expertise and technology from abroad, therefore, improving productivity.⁷⁴ Thus, provided that the economy has an enabling investment environment,

⁷² McMahon (1997) cites the study on "The Economics Effects of Windfall Gains in Export Earnings, 1975-1978" by Jeffrey Davis. The countries included in the study were Burundi, Cameroon, Colombia, El Salvador, Ethiopia, Haiti, Ivory Coast, Kenya, Rwanda, and Uganda.

⁷³ Capital goods for new investments or for replacement of depreciated machinery and equipment will frequently embody new or more advanced technology.

⁷⁴ For some economists a significant increase in mineral production may only lead to a less significant increase in a country's ability to import due to mining is a capital-intensive industry. Mining requires large imports of equipment, machinery and intermediate inputs, freeing only a rather small amount of foreign currency for the remaining economic activities. See for example Eggert, R. (2002.)

an increase in exports due to a significant increase in mineral production will favor growth through capital accumulation and productivity growth.

- *The Income Mechanism.* An increase in mining production augments income of the mining companies involved in the output expansion and their subcontractors and employees. The increase in income of the subcontractors and employees will be spent in goods and services, which will become the income of a second round of suppliers and their subcontractors and employees. In turn, this effect will reach new rounds of suppliers, subcontractors and workers, multiplying the income generated in the expansion of the mining production along the interconnected chain of goods and services in the economy. Depending on the degree of prevalence of unemployment or underemployment, this income multiplier-effect could be quite significant at least at a regional level. Therefore, in the short-term if an economy has significant amounts of unemployment or underemployment, this mechanism will foster growth by reducing idle labor and capital.
- In the medium and long-term, the multiplication of income due to an increase of mining production will likely result in labor and capital accumulation, hence in economic growth. This is because, on the one hand, due to the income multiplier-effect a larger capital stock to satisfy a multiplied demand for goods and services will be required. On the other hand, if the increase in mining production originates in medium and large-scale operations, human capital will accumulate in two ways. First, the mining operations themselves need to qualify their human resources at all levels, and in many cases the human resources of their contractors as well. Second, wages paid in these types of operations are usually higher than in the rest of the economy. This induces better-paid employees to invest part of their additional income in the education of their children to a higher level than themselves, therefore, increasing the accumulation of labor. For example, a gold mining operation in Bolivia trained workers in programs of equalization, professionalization and specialization. In the same mine, it was also identified that an average worker is frugal and saves and invests around 40 of its income, being a priority that their children get a university degree.⁷⁵
- Accordingly, a significant increase in mining output in a country like Mongolia, where mining is a major industry, may foster growth by inducing the accumulation of capital and labor and productivity growth. This process operates indirectly through the fiscal, trade and income mechanisms.

POLICY EFFECTS ON MINING GROWTH

2. From this, it is very tempting to estimate a quantitative relationship between the increase in mining output and growth. As we are dealing with an indirect relationship, such an attempt can be frustrated by contradictory evidence as in two identical economies the results would differ, even to the extent of being opposed to each other, as long as the fiscal, trade and investment promotional policies and institutions differ in those countries. This explains why the evidence on the impact of mining on growth is divergent and contradictory⁷⁶ but also why the informed consensus is that although minerals have the potential to contribute significantly to growth, governments

⁷⁵ Loayza F. et al (2001)

⁷⁶ Auty and Evans (1994) found that whether mineral economies performed better or worse than non-mineral economies depends on the period of analysis and the grouping of countries. Davis (1998) identified five comprehensive studies, which illustrate how difficult, even dangerous, it is to generalize about the relationship between mineral abundance and economic growth. Sachs and Warner (1995) for some 100 developing countries found that the rate of growth is inversely related to natural-resource intensity. Later, however, Sachs and Warner (1999) found the missing policy link as their study shows that natural resource intensity is negatively associated with both the quality of legal and government institutions in a country and the degree to which an economy is open to international trade.

and their policies for managing mineral wealth will ultimately define whether this potential is fulfilled or lost⁷⁷.

3. To avoid squandering this opportunity, a number of key issues need to be considered by the Mongolian economic and fiscal authorities. These include the absorptive capacity of the Mongolian economy and the policies required to overcome its constraints efficiently; the country's investment environment and the competence of its institutions, mainly those relating to the management of the increased revenues such as the fiscal and financial institutional framework; and the variations of the real exchange rate vis-à-vis variations of growth in the export indicators of the non-traditional export sectors. The objective will be to avoid the implementation of policies or programs that could lead to fiscal unsustainability, unproductive investments, rent seeking behavior, and "Dutch disease" effects.

- *Fiscal and Debt Unsustainability.* A large increase in fiscal revenues due to a significant increase in mining output requires sound criteria for public investment and expenditure to translate in production factor accumulation and productivity growth. The risk is that the government could fall prey of an expansive fiscal policy leading to excess in investments and social welfare programs, which saddle the government with recurrent costs beyond its medium-term financial capacity. Loans for financing the consequent fiscal deficit could not only worsen the government's fiscal position but also compromise its debt sustainability. Over time as the fiscal position deteriorates, the government would resort to an inorganic expansion of the monetary base leading to high inflation and macroeconomic and political instability, as was seen during the 80's across Latin America and Africa and, in particular, in mining economies such as Bolivia and Peru. The result is that the growth experienced during the boom cannot be sustained as public investments are not adequately operated and maintained and unemployment is increased.
- In response to a substantial increase in fiscal revenues from a mining boom, the single most detrimental policy that a government may pursue is the creation or expansion of state owned enterprises. As in the cases of Nigeria, and Trinidad and Tobago "not only did these failed undertakings eat up substantial portions of the boom, they left a legacy of debt and losses in the post-boom years, adding substantially to the fiscal deficits of the countries⁷⁸." Eventually, revenues from mining drop, subsidies to other sectors can no longer be paid, and protection becomes too expensive. Then, these sectors exposed to fierce competition are forced to contract, leading to slower or even negative growth rates of the economy overall⁷⁹. In Bolivia during the 70's, when tin prices reached their highest historical levels, the state mining company COMIBOL embarked in an ambitious R&D and investment program on flotation and volatilization technologies to increase tin recovery rates while the large international mining companies were pursuing a strategy of reducing costs by developing large scale ore deposits. During the first half of the 80's tin prices dropped by 70 percent rendering uneconomical the large investments carried out by COMIBOL, which became a major source of the Bolivian famous hyperinflation⁸⁰. This illustrates that inadequate investment policies result in ineffective capital accumulation, productivity decline and, therefore, in the drop or slowing down of growth.
- *Rent Seeking Behavior.* When government institutions are weak, an increase in fiscal revenues originated in a larger mining output may further affect growth due to rent seeking and patronage would permeate into the government agenda. Growth is impaired because

⁷⁷ McMahon, G. (1997) using a multiple case study, which comprised four countries that received a major positive resource shock –Botswana, Colombia, Trinidad and Tobago and Nigeria–, demonstrates that mineral abundance could be a curse or a blessing depending on the countries' policies to manage the windfall.

⁷⁸ McMahon, G. (1997), p. 15.

⁷⁹ Weber-Fahr, M (2002)

⁸⁰ Jordan R. & A. Warhurst (1992)

although public investment increases, its productivity drops. Corruption usually reduces the quality of infrastructure, which increases the cost of doing business for both the government and the private sector and thus leads to lower output and growth⁸¹. Due to some relation found between mineral countries and government ineffectiveness and corruption, some authors consider that mineral wealth weaken the state as its traditional functions give way to redistribute revenue⁸². However, there is broader agreement that the lack of good governance is the main explaining factor instead of mining wealth. Without good governance, a rapid increase of fiscal revenues originated in natural resources windfalls or aid flows will likely be associated with a decline in the quality of expenditure and lack of transparency and accountability in the use of these resources⁸³.

- *Absorptive capacity constraints.* Even without the existence of corruption or rent seeking behavior, a large increase in mining fiscal revenues could lead to unproductive public and private investments mainly due to absorptive capacity constraints in the economy such as weaknesses in public expenditure and financial management, weaknesses in policies determining the broad investment climate, infrastructure bottlenecks and so on. Under these circumstances, public investments in projects with very low or even negative social returns could be carried out. In absence of profitable alternatives in which invest the additional income, private investments would run to the real estate market leading to construction booms and real estate speculation, which will eat up most of the windfall. According to the World Bank's experience⁸⁴, several low-income countries suffer from absorptive capacity constraints and their administrative and management capacity can be overwhelmed by a large increase in income and revenues.

4. Unproductive investment booms can have strong historical foundations and have been a typical trap for developing countries eager to diversify their economies. "First, from approximately 1955 to 1980 industrialization via import substitution dominated development thinking. When the booms took place, many of the resource abundant countries were trying to diversify away from a reliance on primary production to a more modern industrial economy, with manufacturing as the leading sector. Resource booms allowed the government to accelerate the process of import substitution far beyond the absorption capacity of the economy... Second, countries following import substitution strategies generally had repressed financial systems in order to direct credit to the priority sectors and prevent capital outflows. When the boom took place, there were few profitable investment options that the private sector could do with its part of the windfall. Thus, a large part of the private sector windfall was either transferred to the government via high implicit taxes on domestic financial instruments or spent on durable consumer goods and construction projects... Third, for many countries that previously were not following import substitution policies, or had very limited programs, the boom windfall was an irresistible temptation to change course. The end result was similar to, and often worse, than that suffered by countries that had long been on the import substitution path... Fourth, political pressure on the government to spread investment across all of the regions of the country or to support failing industries was often an important factor behind the perverse investment booms."⁸⁵

- *Dutch Disease.* A significant increase in mineral production might also impact on growth affecting the competitiveness of the non-minerals export industry, notably the

⁸¹ Tanzi, V & H, Davoodi (1998) contends that corruption increases the number of capital projects undertaken and tends to enlarge their size and complexity. The result is that some public investment can end reducing a country's growth because, even though the share of public investment in GDP may have risen, the average productivity of that investment has dropped.

⁸² See for example Ross, M (2001) and Snider, L (1996)

⁸³ See for example IMF Staff Note (2003), Weber-Fahr, M (2002) and Eggert, R. (2002).

⁸⁴ World Bank Guidance Note (2002)

⁸⁵ McMahon (1997), pp: 34&35

manufacturing industry⁸⁶. Due to the mining output expansion, input factors, especially labor, will move towards the mining industry. The adjustment takes place generally through an increase in wages. Such contraction or slowing down in the rate of growth of the manufacturing industry may affect growth because the manufacturing industry is considered to have greater dynamic externalities and learning effects than mining. Thus, an expansion of mining at the expense of the manufacturing industry negatively impinges on productivity growth. The intensity of this effect will depend, however, on the level of unemployment since the mining production expansion can occur tapping idle labor. Currently, for the Mongolian economy this type of effect is of minor importance as like many low-income developing countries Mongolia has idle capacity to utilize for expanding mining production, if required.

- In addition, the economy could experience losses in productivity growth when the mining expansion causes an appreciation of the exchange rate due to the greater supply of foreign currency. This is because the appreciation of the exchange rate impairs the competitiveness of the manufacturing industry as imports become more competitive while, at the same time, exports are less competitive. Such a situation, however, is conditioned by the way the additional income or revenues from mining are managed. If, for example, the additional mining revenues are largely invested in improving the quality of labor i.e. through better health and education services, and infrastructure, the decline in productivity growth can be compensated in the medium-term. Moreover, because of the large productivity gap between industrialized and low-income developing countries, it is possible that a low-income developing country could experience a sustainable real appreciation of its currency if low-cost productivity increases were achieved⁸⁷. Thus, as long as the additional revenues from the mining expansion are used to unlock low-cost productivity gains, an appreciation of the exchange rate will affect neither the manufacturing sector nor economic growth⁸⁸.

5. Summing up, a significant increase in fiscal revenues due to a major increase in mining output can be mismanaged affecting growth in the medium and long-term through low or negative capital accumulation and the decline or insufficient growth of productivity. Capital accumulation and productivity growth are impaired by unproductive investments, especially in SOEs, and the creation of an adverse investment environment towards the end of the mining boom. Unproductive investments may arise from rent seeking behavior, corruption and a constrained absorption capability that is not balanced with access to financial options outside the domestic economy. An adverse investment environment is the consequence of the macroeconomic disequilibria that follows the end of a mismanaged mining boom, the unproductive investments' low or negative returns, the fiscal and sometimes debt unsustainability in which the economy becomes trapped. The factors underlying this process do not originate in the expansion of the mining production itself but on the flawed policy and institutional framework established for managing this opportunity.

⁸⁶ This effect is commonly known in the literature as Dutch Disease.

⁸⁷ "A real appreciation of the exchange rate does not necessarily have to signal a problem... For this reason, in parallel with the analysis of movements in the real exchange rate, Fund staff also monitor various growth and export indicators, in particular for the non-traditional export sectors (see for example page 17 of the recent Mozambique staff report, IMF Staff Country Report no.02/140)" (IMF Staff Note, p:7)

⁸⁸ Dutch disease effects have been recently the focus of empirical analysis due to increased aid flows to low-income developing countries such as Burkina Faso, Cote d'Ivoire, Malawi and Sri Lanka. The conclusion is that in the medium-term Dutch Disease effects will be determined by the scale of the additional resources received by the recipient country but more importantly by how these additional resources are used and how the supply side of the economy responds to these different uses. See IMF Staff Note (2003), World Bank Guidance Note (2003), DFID (2002). McMahon (1997), in the aforementioned study of four natural resource dependent economies that were subject to major positive resource shocks in the 70's and 80's, did not find signs of Dutch Disease. However, in Nigeria and Trinidad and Tobago, which mismanaged the booms, the agricultural sector was devastated.

ANNEX 3. REGIONAL ECONOMIC DEVELOPMENT

1. Sweden's heavy machinery industry and, more recently, Sudbury, Canada, and Western Australia, have shown the regional economic linkages of mining can be strong. In the middle of the 20th century, however, low transportation costs, especially for long-distance ocean transport of bulk materials, and the greater technological complexity of modern mines significantly weakened the regional economic impact of mining.⁸⁹ Major technical changes have made mining a truly global industry. Many inputs required for the production process are bought far from where mines are located. Minerals and metals sold in commodity markets feed manufacturing industries located thousand of kilometers from the place they were extracted. Therefore, since the middle of last century, mining has tended to develop as an enclave industry.⁹⁰ The less developed or isolated the mining region, the stronger the tendency of the industry to develop as an enclave.

2. Mining is a global industry in which companies compete mostly by lowering costs. For regions in the developing world, mining brings static economies mainly in the form of infrastructure that can support regional development and diversification. However, due to weak upstream and downstream linkages,⁹¹ dynamic externalities from mining such as learning, innovation and SME promotion are often constrained, and mining's potential for promoting regional development in developing countries is rather limited. Nevertheless, in the last decade some multinational mining companies have been active in strengthening their upstream links with SMEs as an instrument for promoting regional development. This recent trend away from the enclave model could help development of reformed mining economies such as Mongolia.

UPSTREAM LINKAGES

3. An increase in mining output usually takes place in regions with large geologic potential. Thus, a significant increase in mining production is frequently concentrated in a region, resulting in increased regional demand for intermediary goods and services. Part of this demand will be for infrastructure, such as roads or ports that during their construction along with mine development and the setting up of processing facilities can mobilize a number of large and medium enterprises. If the region exhibits large geologic potential, construction activities can extend over a wide time span, creating a rather permanent demand based on temporary requirements. Once completed, infrastructure creates positive, although static, externalities i.e., reduction of transportation costs or better access to markets to the region and some minor requirements for maintenance. Another fraction of this demand will be for intermediary inputs such as machinery, equipment, chemical reagents, transport services, and electric power. Meeting this demand could last for years, even decades, opening a possibility for the development of a diversified chain of suppliers.

4. Although these are likely to be specific to a region's cultural, economic, geographic and social characteristics, Chile's Antofagasta copper mine⁹² shows that often only few large national or multinational suppliers derive significant benefits from their relationships with the mining industry. In contrast, small and medium suppliers, which are highly labor intensive, tend to be trapped in a survival strategy with little chance for growing and enhancing their productivity. Other studies carried out in Latin America also found that the development of upstream linkages from the mining industry show more limitations than potential.⁹³ Apparently, mining regions in the developing

⁸⁹ See Lundgren, N (1996)

⁹⁰ See for example Eggert, R (2002) and Strongman, J (1998)

⁹¹ Hirschman, A. (1957 and 1977) introduced the concept of linkage as the force with which certain investments induces other, related investments. This explanation of development pertains to a group of similar ideas such as the Big Push of Rosenstein-Rodan, Rostow's take-off triggered by the "leading sector," Gerschenkron's "great sting" or the minimal critical effort of Leibenstein. In the explanation of development proposed by Hirschman, the manufacturing sector has more linkages than the primary sector to the rest of the economy.

⁹² Antofagasta, located in the north of Chile, is an arid and scarcely populated zone where mining contribution to the gross regional product was 62.5 percent en 1996. It is the largest mining region in the Andean zone of Latin America.

⁹³ See Buitelaar, R. (2001)

world today face a tradeoff between present day efficiency based on imported capital goods and future efficiency with a local capital goods industry, which makes very difficult for latecomers to enter the machinery, equipment, and instrument industries.

5. However, as the impact of mining on local development became an issue for the global mining industry in the 1990s, a trend toward reversing the mining enclave model emerged. Market forces can fail in dealing with the relationship between large mining firms and small and medium local suppliers due to information asymmetries. Buyers do not know all the existing or potential local supply and suppliers seldom have all the available demand information. There is some room, accordingly, for policies oriented to improving the information available to buyers and sellers about each other needs and capacities that can strengthen the quantity and quality of links between large mining operations and local suppliers. Some multinational companies, also, been taking an active approach to outsourcing locally to promote regional development⁹⁴ both because the value of mining has been called into question due to its limited development impact and because a sound mining industry requires a prosperous region with sustainable growth.

6. For example, the South African Anglo American Corporation has established a small business development program⁹⁴ with three main components. First is the Small Business Committee for outsourcing mining opportunities to SMEs at each of its operations. This committee screens business proposals and ideas and provides a platform for exchanging information and receiving proposals, which are approved on a competitive basis without compromising their quality. Second is the Small and Medium Enterprise Development Initiative for outsourcing non-mining opportunities, such as repairs and maintenance, security, gardening, laundry, brick manufacturing, and information technology. Under this initiative, business proposals are examined as thoroughly as proposals for mining related opportunities. Third is a component for providing SMEs with technical assistance loans, bridging finance, and venture capital. During 2001, Anglo American South African divisions and operations concluded some US\$151 millions worth of transactions through the procurement of goods and services from SMEs.⁹⁵

7. In addition, unlike Antofagasta, if in a mining region a diversified industry structure develops comprising a few large operations and many medium and small mines, as may happen in Mongolia, significant domestic demand might be created.⁹⁶ As a result of a major expansion of the mining output, therefore, SMEs would be better able to develop for supplying to the mining industry goods and services as high quality grinding balls, security and transport services, and safety equipment.

8. Although the government has no direct policy to support them, one of the stated priority objectives of MIT is to increase employment through SMEs, which now play an important role in the Mongolian economy. SMEs began to appear in 1990 with the introduction of the free market economy and by 1997, they produced more than 60 percent of the country's GDP, and accounted for 80 percent of the workforce (480,000 people). Most are privately owned family businesses and one third of SMEs are managed and owned by women.

9. A small number of companies are already actively engaged in supplying services to the mining and exploration companies. However, as the mining sector in Mongolia is due to grow at a moderate rate over the next 10 years, the potential to grow indigenous support industries, particularly SMEs, is growing. While mining sector backward supply linkages generally only benefit large suppliers, apart from the large mines in Mongolia (Erdenet and possibly Oyu Tolgoi),

⁹⁴ See, Chosi, S., (2001)

⁹⁵ "Resourcing our future", Anglo American plc., Safety, Health and Environment Report 2001, pp: 38

⁹⁶ In the mining and development literature, there are few studies that in the developing country context systematically address the relationship between regional development and mining such as Buitelaar, R., (2001). Moreover, the author is unaware of any study that focuses on such relationship when the mining output is to a large extent supplied by small and medium scale mining companies.

the majority of mines being developed are likely to be small to medium, geographically diverse, and varied, and could well create significant domestic demand for smaller suppliers of good and services. Evidence of this can be found at the Borro Gold mine (annual production of 5,000 kg per year), where the mining company has contracted a number of local companies to assist them during the construction phase of the mine. SMEs are now supplying maintenance, haulage, catering, lime supply and transportation services to Borro and this level of SME activity is expected to be maintained during the mining phase as local companies adopt to the needs of the company.

10. There is scope for the development of additional local SMEs. For example, the steel mill at Darkhan could supply grinding balls to the mines, but its current products do not meet the required standards. Footwear manufacturers in Mongolia appear to have not identified the mining sector as market to target and hence safety boots, widely used through the sector are imported. Also, mines located in remote areas have difficult in accessing local suppliers as SME do not exist in these areas. This can be exemplified by Tumurtiin, where the mining company has tried unsuccessfully to find a local company with the capacity to ship its concentrate by truck to the Chinese border.

Annex Table III.1 Typical Products and Services Required by the Mining Sector

Catering	Aggregate/ sand and gravel supply
Haulage	Clothing
Semi-permanent buildings/dwellings	IT / communications suppliers
Footwear (Safety boots, etc)	Drilling contractors
Geological/Engineering/Surveying services	Spare parts (grinding balls)
Medical / Health Services	Specialized export/import agencies
Security services	Lime supply
Assay labs	

11. As new mines come on-stream in the short to medium term, there is considerable potential to develop SMEs in the supply of support goods and services. This could not only reduce the cost of importing substitute goods, but also have a marked impact on local employment with the additional benefit of linking the mine and local community together. A promotional program is required to incubate and nurture fledgling SMEs as the general skills base in Mongolia is low, especially in IT, accounting, marketing, promotion, finance, and general management.

12. Potential also exists in the informal mining sector, where large numbers of unregistered micro-enterprises have emerged, a broad demand exists, and structured assistance could lead to more sustainable development of the rural economy. In the recently published “Rural Development Strategy for Mongolia,” the need to create an “enabling environment for rural economic and social development” is promoted. The documents makes specific reference to non-farm SME development with “small-scale hand mining of gold, fluorspar and other minerals by local people” highlighted as one of the areas that should be supported as a diversified livelihood strategy for sedentary agricultural communities. Although it should be noted that the transformation of informal miners into responsible SMEs will require considerable capacity building and support of all involved stakeholders, it should be regarded as an opportunity to promote local community development.

DOWNSTREAM LINKAGES

13. An important increase in mining output augments the minerals and metals available for transformation in the domestic economy. The issue will be, however, the extent to which a greater availability of minerals and metals is favorable to the development of a manufacturing industry that uses minerals or metals as inputs or fosters the development of established domestic processing or manufacturing industries. Although this is a field scarcely studied, the main limitation to promoting the production of manufactured goods from the metals or minerals produced in

mining regions would be their distance from main centers of consumption and manufacturing expertise. In Antofagasta, for example, the highest achievable stage of production seems to be the refining of copper.⁹⁷ Nevertheless, there might be some room for SME promotion in the production of handicrafts and jewelry in regions with long handicrafts traditions and possessing specialized skills in this type of industry. The question remains, however, whether the local supply of raw materials or metals is somehow a competitive advantage for the local industry. It seems more likely that enhancing the access of the local industry to global markets would be much more important than increasing the local supply of minerals and metals.

COMMUNITY DEVELOPMENT

14. An increase in mining production results from the discovery and development of mineral deposits and the building and use of mining and processing facilities. All these activities are carried out in a concrete place, which, in most cases, is the land of local or indigenous communities. The inevitable fact is that both the tension and conflicts increase in the region if the local or indigenous communities oppose the mining project, or the project and local communities become good neighbors. The latter can be a precondition for the increase in mining production to take place effectively.⁹⁸

15. Mining legal frameworks seldom give rights to local communities in relation to permitting mining activities or partaking in their benefits.⁹⁹ Since the 1990s, however, such situations have become increasingly untenable,¹⁰⁰ leading to a process of discussion and change that, although in a state of flux, has legitimized community claims that if mining is to take place in their lands or vicinity, it should bring them development.¹⁰¹ In this regard mining revenues could impact on communities' development through three main mechanisms: land acquisition and compensation; economic benefits sharing, and social programs. These mechanisms are briefly analyzed below:

16. Land Acquisition and Compensation. The textbook recommendation is to compensate owners whose land has been acquired for mining through lands of similar quality in the region; however, this option is not always possible and is sometimes supplanted by monetary compensation. Depending on the property regime, compensation goes to the community overall for community lands, or to individual holders of private lands. Property rights and titling are, therefore, critical issues in the process. For example, should companies negotiate access to community untitled lands with the communities themselves or the government? If titling is not an issue, the price paid and process followed to compensate landowners is another key issue. Protracted and bitter conflicts between local people and mining companies will arise if land of similar quality is paid different prices, even if they were higher than the prevailing market prices.¹⁰³

⁹⁷ See Buitelaar, R. (2001)

⁹⁸ Joyce, S. & I. Thompson (1999) found that mining companies to operate effectively need gain a community's approval and trust, which they called a "social license to operate," in addition to the legal rights granted by the state.

⁹⁹ Colombia in Latin America and, Papua New Guinea and Philippines in Asia have pioneered legislation entitling rights in indigenous communities prior to granting mineral exploitation rights to miners.

¹⁰⁰ McMahon, G. and J., Strongman (1999) identified four reasons for this change. First, employment-related benefits reaching the local community have decreased considerably. Second, the assimilation of indigenous people or culturally diversified local communities is no longer seen desirable or inevitable. Third, globalization has rapidly permeated in the mining industry. Fourth, strong trends are consolidating toward decentralization of state activities and responsibilities.

¹⁰¹ Strongman, J (1998) suggests that the traditional enclave model has the limitation of generating a culture of dependency and when the mine closes, typically the community collapses.

¹⁰² Remy, F. and McMahon G. (2002) show that in the Andean countries large mining companies paid for land amounts several times higher than the market prices. Nevertheless, "two issues proved especially troublesome. The first was a perception of fairness or unfairness in the relative prices paid to different sellers, as price differences became an irritant in the process. The second was whether employment was part of the package, as employment provides a secure income and status in the new social context of the region."

Those getting lower prices will frequently oppose mining activities and seek a review of their compensation settlements.

17. For people living from traditional agriculture, monetary compensation for land can be economically and socially dangerous. Money can be easily lost in failed business or financial investments, causing social disruption and further pressures on the mine to deal with a problem the company thought it was solved. Thus, only a much more comprehensive approach to compensation can impact positively on local community development. A well conceived compensation process should recognize that the value of land is not the issue, but a way of living based on land that needs to be adjusted to the short-, medium- and long-term changes the mining operation will bring about in the community. Thus, the most advanced compensation agreements include the creation of spin-off businesses¹⁰³ for displaced landowners, employment in the mine, training, and capacity building.¹⁰⁴ Only this type of approach can effectively compensate landowners and assist them in acquiring the capabilities to use financial resources as an alternative asset to land.¹⁰⁵

18. *Economic Benefits Sharing.* Paradoxically, in most developing countries fiscal revenues from mining do not reach local communities where the minerals deposits are located. As, generally, minerals belong to the state and land rights are different from those to access mineral resources, mining taxes are defined and collected as national revenues. Recently, the trend toward state decentralization has lead to decentralization of mining fiscal revenues to the provincial level but not to the local community level,¹⁰⁶ with very few exceptions, such as Papua New Guinea.

19. In many cases, this has implied that remote communities close to mining operations have not benefited from the mining surplus partaken by the state through the taxation regime.

20. This state of affairs has become increasingly untenable in the developing world. It is likely, therefore, that in the future, this situation will be reversed and local management of part of the mining fiscal revenues will be a key component for fostering local development. Thus, Paspua New Guinea's "development forum" warrants consideration by Mongolian policy makers, especially at a time when the fiscal and regulatory framework for mining is being formulated. Although far from an ideal system, the successful development forum demonstrates that allocating and managing mining fiscal revenues at the local level requires two conditions. First, an integrated framework for compensation and benefit sharing should be established. Second, a trilateral dialogue and concerted efforts between the government, the local community and the mining company is necessary for the formulation and implementation of community development plans.¹⁰⁷

¹⁰³ *Perceptions differ about the convenience of mining assisting local business developments. For Remy, F. and McMahon G. (2002), for example, outsourcing is critical for the economic impact of mining operations because is the key source of entrepreneurial development. Further, the multiplier effects of an operation are much larger if there is substantial local outsourcing due to a larger monetary injection and because employees of contractors usually spend their money in the local economy. On the other hand, the MMSD report (2002, pp: 202) suggests that "the concentration of economic activity centered around the mine often increases the community's dependence on the mining operation, making it vulnerable to downsizing or other changes and exacerbating the power imbalance... Since the company may also depend on the community for employees and services, a well-organized community can potentially make numerous demands on the company."*

¹⁰⁴ *The Red Dog mine in Alaska is a model for this approach of compensation that focuses on land as a key development issue and not merely as an asset. See <http://www.teckcominco.com/operations/reddog/articles.htm>*

¹⁰⁵ *Even this approach, however, is not free from problems. Remy, F. and McMahon G. (2002) note that in the Andean region the new economic opportunities and land payments created rivalry between those villages directly affected by the mine operation and those in the nearby region of the mine.*

¹⁰⁶ *According to Eggert, R (2002), the devolution of power and responsibilities from national to regional and local governments is leading, at the project level, to rule for public participation in the process of determining whether a proposed mine is approved and, in the realm of fiscal policy, the level, form and disposition of taxes and royalties.*

¹⁰⁷ *Remy, F. and McMahon G. (2002) found that in Latin America mining companies frequently negotiate with the central government and local communities separately. There is very little communication between the central government and the local community. This situation seems to be changing in the most recent mining developments as attested by the Antamina mine in Peru.*

Box III.1 The Development Forum in Papua New Guinea (PNG)

The mining sector in PNG is a major contributor to both the GDP and exports. In 2000, mining and quarrying represented 17% of GDP and was second only to agriculture, forestry and fisheries. Minerals represented 50% of total exports, with a predominance of gold and copper. Modern large-scale mining development commenced in Papua New Guinea prior to independence with the establishment of the Bougainville Copper mine in 1972. This was followed by the Ok Tedi mine, which commenced gold operations in 1984. These early mining developments were characterized by agreements struck between a few relevant national government agencies and the developer. Later, the social impact of these developments became increasingly apparent. As a result, the involvement of all levels of government and the affected landowners in the development process has progressively become an integral part of major mining project development in PNG. In November 1988, a Cabinet decision instituted a process of consultation between the national government, the provincial government, and local landowners over the distribution of benefits from mineral resource development, which soon came to be known as the Development Forum. The Development Forum evolved over time into a participatory approach to decision-making and revenue distribution involving government, company, and local community representatives. To date, the Development Forum has functioned well and has been instrumental in achieving a higher level of participation by local communities. It has also secured a greater level of community support for mine development. The forum has two principal functions. The first is as a venue for the sharing of information on the project from the developer and the State with the landowners on the nature, scope and impacts of the project. The second is to establish how the benefits derived from the project are to be shared by the various stakeholders, which are then recorded in a series of project agreements. These agreements consist of the lists of services and benefits that the national and provincial governments will provide in the project's affected area. These include the provision of community infrastructure and the sharing of project's financial benefits. In return for the benefits, the landowners commit themselves not to disrupt the project development and to work together with the government and the developer. It also commits the parties to an ongoing consultation process where development related issues could be discussed and resolved as they arise. This initial consultative process and the establishment of the various agreements take place prior to final approvals for the project being granted. By the end of the 80's, the Porgera gold mine was the first major project developed under the Development Forum in the Enga province in the PNG highlands. In 1999, PNG's stakeholders would have received 37% of the value of the extracted minerals by the project. Approximately 41% of these revenues went to the national government and 4% to national employees. The Enga province, consequently, received around 55% of the revenues. Two fifths of this amount was allocated to local community as follows: 45% through fiscal expenditures and payments to the landowners; from the remainder (55%,) local employees received around 75% as wages and 25% were received by local business through operations contracts. In summary, the development forum process in the Porgera mine allowed that a majority of mining revenues was received at the provincial level. Moreover, from the provincial portion 40% were allocated to the local tribe, Illipe.

Source: Based on Christmann, P and N, Stolojan. (2002); Hancock G, and T, Omudsen (1998); and MMSD report (2002)

21. Social Programs. In the absence of this sort of framework, mining companies have resorted to establishing foundations to deal with the pressures for development of the surrounding communities. Foundations are institutions primarily supported by mining companies but capable of leveraging funds for community development from other sources such as private donors and public funds. Managed at arm's length from the mining company, a foundation is an alternative for filling the void left in education and health services, and basic infrastructure in remote communities neglected by distant state or provincial administrations. In the large majority of developing countries, therefore, foundations supported by mining companies have been established as mineral production expanded, especially by multinational mining companies. A foundation is the second best solution to address local communities need for development because it is ultimately a company's creature. Foundations have evolved from institutions that defined what is best for the communities to more opened institutions with greater sensitivity to the main need of communities for accumulating social capital as a prior requisite for development. As a result, nowadays foundations place a strong emphasis on training communities to increase their skills for community development. They help communities to organize themselves, to negotiate with both companies and central governments, and to take advantage of the opportunities offered by the mining operations.¹⁰⁸ "Benefits from foundations can be further leveraged when the private sector in a given region engages or is engaged by both the communities and government in a trilateral dialogue aimed at regional development. A notable example is the Productive Development Corporation of Chile's Second Region [Antofagasta]. It began as an initiative of the regional government aimed at linking the regional development strategies to large companies and universities in order to foster public-private regional development efforts."¹⁰⁹

Box III.2 The Rossing Foundation

In Namibia, the Rossing mining company created the Rossing Foundation in 1979. The foundation is overseen by an independent Board of Trustees and is financed through donations from the earnings of the Rossing Mine. The company contributes 3% of its net earnings to the foundation, and by 1996 it had invested US\$25 million. It is estimated that more than 15% of Namibians have benefited from the activities of the foundation. The Rossing Foundation's principal objective is to improve the living conditions of Namibians through activities such as informal education and training, a library network, and assistance to self-support programs in the rural communities, particularly in the artisan sector. The policy is to create projects principally in regions where Rossing employees were recruited.

The activities of the foundation have grown enormously since 1990, becoming an internationally accepted organization that between 1994 and 1996 administered US\$10 million from other donors, including the World Bank, the European Community, and the USAID. Strategic areas of investment are in line with government policy and accepted by the community. Key to the foundation's success is a bottom-up participatory approach to decision-making and the priority given to the development of trust among all participants.

Source: Extracted from the MMSD report, (2002) pp: 214

¹⁰⁸ Loayza et al. (2001) illustrates this evolutionary process of foundations through the case of Inti Raymi foundation established by the largest gold mining operation in Bolivia during the 90's.

¹⁰⁹ Remy, F. and McMahon G. (2002), pp: 8

INFRASTRUCTURE REQUIREMENTS

22. An important consideration for the government of Mongolia in its desire to develop the mining sector, is the low level of infrastructure development throughout the country. A well developed infrastructure is vital for mining. Large and medium mine developments, such as those likely to occur in Mongolia almost universally require significant power, water, and transportation infrastructure. Sftable

23. Some of the prospects described in this survey, particularly if they are marginal deposits, may not be developed because the cost of building the required infrastructure will make the projects uneconomic.

Annex Table III.2: Mongolian Mines and Prospects and Major Infrastructure

Mine / prospect name	Distance from Electricity supply (km)	Distance from railway	Distance from major road	Distance from major river
Boroo Au	19	12	18	15
Tumurtiin Zn	203	360	10	125
Oyu Tolgoi Cu/Au	340	340	120	300
Bumbat Au	12	67	17	12
Olon Ovoot Au	125	390	40	36
Gatsuurt Au	32	12	12	12
Surven Sukhait Cu/Mo	185	185	20	360

Source: MRAM

24. Mongolia's largest prospect, Oyu Tolgoi, is located in one of the remotest parts of Mongolia and exemplifies how important infrastructure is. The prospect has no water, power or transportation on site, being over 300 kms from each. While water will probably be found through drilling in the vicinity of the prospect, a roadway or railway needs to be built to the site from China. A power source also needs to be established, either through the construction of a power plant at the mine or by running high-voltage lines from the existing Mongolian or Chinese national grid. While the prospect's operators are examining the possibilities of building a railway line from China to the deposit site using state-funding, it is certain that the cost of providing the necessary infrastructure will dramatically increase the capital cost of developing this prospect and may end up delaying its commissioning by a number of years. These levels of investment requirements would also apply to the marginal Surven Sukhait Cu/Mo deposit, placing considerable doubt on the economic viability of the prospect.

25. The Tumurtiin Zn mine is not close to a railway line, which is the preferred and most cost-effective mode of transporting concentrates. It will, therefore, be forced to transport its concentrates either by truck 360kms to the nearest railway station and from there by railway to smelters in China, or by truck alone to China through the border crossings directly South of the mine. Either option will result in a higher operating costs than if the mine was located close to a railway station.

26. While small to medium gold mines, such as those to be developed in Mongolia, do not require the same level of infrastructure as large-bulk tonnage base metal mines, they still require adequate two-lane tarmac roadways, electricity and adequate water for their operation. Borro, Bumbat and Garsuurt are extremely fortuitous to be positioned so close to road, railway and power networks. Water is also readily available. However, the Olon Ovoot deposit located in the South Gobi Desert ~100 kms from national grid and will therefore either need to construct a ~10 MW power plant on-site or extend the grid to the supply the mine operation. The mine will also need to construct a 2-lane roadway from the existing road network to the site.

27. Clearly a mine/prospect's proximity to road, railway, and power infrastructure has a major impact on the capital cost of development. In some case, prospects that would normally be viable will be rendered uneconomic if the costs of providing the necessary infrastructure are onerous. The GOM therefore needs to give serious consideration to development of infrastructure in Mongolia over the next ten years, as the location of new roads, railways and power plants will have major impact on the potential development of the mining sector.

ANNEX 4. OVERVIEW OF TAX LAW

1. Most of Mongolia's important tax laws were introduced in 1993, and were updated in 1997.¹¹⁰ There are 23 kinds of taxes imposed on legal entities and individuals. Table 1 identifies the most important taxes in terms of tax revenue.

2. The General Taxation Law of Mongolia sets out the framework and principles for taxation. According to this law, only the State Ikh Khural (Parliament) is authorized to introduce, suspend, and amend tax laws. This law identifies the 23 national and local taxes, and addresses matters that apply to all tax laws in Mongolia, including: taxpayer registration, taxpayer rights and obligations, and the activities, rights, and responsibilities of the national tax administration.

Annex Table IV.1 Summary of Tax Collections (tg billions)

	All Industries					Mining ¹	
	1997	1998	1999	2000	2001	2001	% ²
VAT ³	38	46	60	76	104	3	3
Social security	21	26	30	39	54	6	11
Excise tax	20	24	27	41	53	-	-
Corporate income tax	55	31	26	48	44	15	34
Customs duties	9	2	9	22	27	-	-
Personal income tax	8	10	13	15	21	2	10
Land fees	1	2	2	3	5	1	20
Royalties	4	3	3	3	4	1	25
Vehicle tax	1	2	3	3	3	-	-
Other taxes (16 taxes)	6	8	8	11	13	-	-
Total	163	154	181	261	328	28	9

Source: Ministry of Finance and Economy

¹ GDNT estimate. Data for the mining industry prior to 2001 is incomplete.

² Percent of total tax collections from all industries.

³ The VAT replaced the sales tax effective July 1, 1998. The numbers for 1997 and 1998 include sales tax.

The principal taxes that apply to the mining sector may be summarized as follows.

CORPORATE INCOME TAX

3. Corporate income tax is levied under the May 1997 Economic Entity and Organization Income Tax Law (EEOITL) of Mongolia. Tax is imposed at the rate of 15 percent on the first Tg100 million¹¹¹ of taxable income, and 40 percent on taxable income in excess of this figure. Certain kinds of income are not subject to these rates, but instead are subject to final tax at lower rates on the gross amount of income. For example, income from bank interest is subject to a 15 percent rate, and income from the disposal of immoveable property is subject to a 2 percent rate.

4. Taxable income derived from a business is determined by deducting operating expenses and depreciation from revenues. Rates of depreciation are prescribed by the EEOITL, and range from 5 years on a straight-line basis for mining machinery and equipment to 40 years on a straight-line basis for buildings. Although it is not clear in the law, it is the GDNT's interpretation that annual depreciation claims are not mandatory, i.e., a taxpayer can defer a depreciation claim for a particular year to a subsequent year. This is a particularly important consideration, given that the law contains no provision for carrying forward losses for deduction in a subsequent year.

¹¹⁰ Although Mongolia's tax laws have been enacted or updated in recent years, and incorporate the essential principles of modern taxation, most of these laws do not yet include the detail and refinements that one would find in the corresponding laws of a more developed country.

¹¹¹ Approximately US\$100,000

5. The law does not address the amortization of exploration and pre-production development expenditures. However, according to a senior official of the GDNT, these expenditures can be deducted in accordance with the accounting principles followed by the taxpayer in preparing its financial statements.

6. The law provides for a number of tax incentives, including:

- A mining enterprise that has a foreign investor benefits from a three-year tax exemption, and 50 percent tax relief for the subsequent three-year period; and
- Where a foreign shareholder re-invests its dividend in a Mongolian company, the company is permitted to reduce its taxable income by the amount of the dividend.

7. Tax for a particular taxation year is payable in monthly installments throughout the year. The law does not specify the basis for these installments. However, according to GDNT, the installments may be based on the previous year's tax liability. In addition, if the taxpayer expects the current year's tax liability to be less than the previous year's, the taxpayer can request a reduction in the monthly installments.

8. Payments to non-residents of Mongolia are subject generally to 20 percent withholding tax. However, this rate could be reduced by tax treaty. As of January 1, 2002, Mongolia was party to 24-four international tax treaties, and had initiated 7 others.

9. Article 63 of the Minerals Law of Mongolia states that the Ministry of Finance shall implement regulations to reflect certain rules that would apply specifically to the determination of the taxable income of mining enterprises, including:

- The amortization of exploration and development expenditures;
- The depreciation of fixed assets;
- A three-year loss carry forward provision; and
- Rules relating to the deduction of infrastructure costs.

The required regulations have not been implemented and could have significant impact on investment decisions and mineral sector development.

PERSONAL INCOME TAX

10. Personal income tax is levied under the Personal Income Tax Law of Mongolia. Personal income tax is based on the principles of residency and worldwide income. In essence, a resident of Mongolia is subject to personal income tax on worldwide income. A resident includes a person who is present in Mongolia for more than 183 days.

11. The personal tax rates are:

10 percent	Taxable income Tg0 to 2,400,000
20 percent	Taxable income Tg2,400,001 to 4,800,000
40 percent	Taxable income exceeding Tg4,800,000. ¹¹²

The personal income tax on salary and wages is withheld by employers and remitted monthly to the government.

¹¹² Approximately US\$4,800.

MINERAL ROYALTY

12. Under the Minerals Law of Mongolia, royalties are payable at the rate of 7.5 percent on the gross sales value of placer gold, and 2.5 percent on all other minerals. Although not specifically mentioned in the corporate income tax law, according to a senior official of the GDNT the mineral royalty paid by a taxpayer is deductible for the purposes of computing taxable income.

VALUE-ADDED TAX (VAT)

13. VAT is levied under the July 1998 Value-Added Tax Law of Mongolia, which replaced the former sales tax law. Mongolia's VAT law incorporates the main principles of modern VAT legislation. The purchase and importation of most goods and services are subject to 15 percent VAT.

14. The export of all goods is zero-rated, so that a mining enterprise that exports its product will be constantly in a refund position with respect to VAT paid on its purchases of goods and services. Refunds are made by cash payment, or credit against the next month's VAT remittance, or set off against other taxes owed the state. The law also provides that 30 percent of VAT collections are to be set-aside in a special fund to provide for VAT refunds. It is understood that mining companies are receiving their VAT refunds on a timely basis.

15. The GDNT has proposed an amendment to the VAT law that, in effect, would prohibit non-producing companies from registering for VAT purposes. The consequence of such an amendment would be to deny VAT refunds to companies during the exploration and development phases, thereby increasing the cost of doing business in Mongolia. It is not known whether VAT paid during these phases of mine life would be recoverable once production starts. Under other countries' VAT laws, VAT paid prior to registration is not refundable.

16. The importation of "heavy equipment" for major exporters and selected priority industries can be exempted from VAT and customs duties in accordance with the terms of an October 2002 Joint Order of the Minister of Finance and Economy and the Minister of Trade and Industry. The mining sector qualifies for this important exemption. The practical experience of this amendment has been less than favorable. For example, the list of eligible equipment does not include drilling equipment. Also, there appears to be some dispute as to whether the exemption applies to equipment imported by a mining enterprise's contractors.

17. Effective January 1, 2002, the sale of gold became exempt from taxation.¹¹³ As a consequence, gold producers in Mongolia are not entitled to VAT refunds, and therefore have to bear the burden of VAT paid on their purchase of goods and services, except where the purchase is exempt under the October 2002 joint order. This can put a Mongolian gold producer at a competitive disadvantage as compared to similar operations undertaken in other countries.¹¹⁴

CUSTOMS DUTIES

18. The July 1996 Customs Tariff Law of Mongolia imposes a 5 percent duty on most imports, subject to the heavy equipment exemption referred to above. Two Russian-owned mining companies are exempt from import duties pursuant to a 1991 bilateral agreement between the

¹¹³ From 1999 through 2001, Mongolia imposed a 10 percent export tax on gold. When this levy was repealed under pressure from the industry and other interested parties, the government, to maintain tax neutrality, amended the VAT law as it applies to gold sales to compensate for the loss of revenues previously derived from the export tax.

¹¹⁴ With the exception of Indonesia and Vietnam, the sale of gold is not exempt from VAT in other countries, so that producers in these other countries are entitled to receive credit for VAT paid on their purchases of goods and services.

governments of Mongolia and Russia. VAT on imported goods is collected by the customs authority at the time of importation.

EXCISE TAX

19. Excise tax is levied under the Excise Tax Law of Mongolia. Excise taxes are imposed on passenger vehicles, alcohol and tobacco products, gasoline, and diesel. Gasoline is subject to excise tax at the rate of US\$11/ton (< 90 octane) or US\$12/ton (> 89 octane). Excise tax is payable on diesel fuel at the rate of US\$15/ton.

20. The customs authority collects the excise tax on imports. Otherwise, the GDNT is responsible for administering the excise tax.

SOCIAL INSURANCE PAYMENTS

21. Mongolia's social insurance program is administered by the General Department of Social Insurance under the jurisdiction of the Ministry of Labor and Social Care. The Department has collection, audit, policy, information technology, and human resource divisions.

22. Table 4.2 shows the social insurance rates for the five components of the program. The employees' payments are collected through payroll withholding, and both the employers' and employees' contributions are remitted to the central government, where separate funds are maintained for each of the five components of the program. The department audits the employer's accounts every second year. This audit is conducted separately from the tax audit.

*Annex Table IV.2: Social Insurance Rates*¹¹⁵

	Employer	Employee
1. Pension	13.5%	5.5%
2. Disability	1.0%	1.0%
3. Workplace accident/disease ¹¹⁷	1/2 or 3%	-
4. Unemployment	0.5%	0.5%
5. Health ¹¹⁸	3.0%	3.0%
Total	19 -21%	10%

Source: General Department of Social Insurance

STABILITY AGREEMENTS

23. Under the Minerals Law of Mongolia, the holder of a mining license and the Government, as represented by the Minister of Finance, may enter into a Stability Agreement¹¹⁸. The law states that the Agreement may provide for:

- i. The stability of the prevailing tax rates for a defined period of time¹¹⁹;

¹¹⁵ Percent of salary and wages.

¹¹⁶ Rate depends on industry sector's risk rating. The mining sector currently pays 2%. The Government is contemplating putting mining into the 3% category.

¹¹⁷ The employer and employee according to the specific terms of employment share the total premium of 6%.

¹¹⁸ The General Taxation Law of Mongolia confirms that the Minister has the authority to enter into a Stability Agreement.

¹¹⁹ Current stability agreements have terms of ten or fifteen years.

- ii. The right of a licensee to export and sell its products in international markets; and
- iii. A guarantee that the licensee may receive and dispose of hard currency derived from such sales.

24. To date, three mining companies have entered into Stability Agreements. The term of the Agreement is ten years in the case of an investment greater than US\$2 million, and fifteen years where the investment exceeds US\$20 million. A mining licensee is not obliged to enter into a Stability Agreement. There is at least one important producer that has declined to enter into a Stability Agreement, because it did not want to be locked into existing tax rates.

25. The Government establishes a working group to negotiate the terms of the Stability Agreement. From a tax perspective, a standard agreement will confirm:

- Eligibility for the tax exempt period;
- The corporate income tax rate (but not the rules for determining taxable income);
- The customs duty rate;
- The VAT rate; and
- The minerals royalty rate.

26. The standard agreement does not state that the license holder is protected from the imposition of new taxes that may be introduced after entering into the Stability Agreement. There is apparently some disagreement within the Ministry of Finance and Economy (MOFE) as to whether such protection prevails. The standard Agreement does not permit the licensee to benefit from favorable tax changes such as future tax rate reductions. However, again there is some disagreement within the Ministry as to whether such a benefit can be incorporated in a particular Stability Agreement.

27. There are differing views within Government as to how much flexibility the Minister has in negotiating a Stability Agreement. It is understood that an original draft of the legislation for stability agreements allowed the Minister some discretion, but this discretionary provision was not enacted. The current view is that the Minister may make concessions only within the limits of the law. It is possible that the terms of at least one of the existing Stability Agreements may go beyond the scope of the provisions of the Minerals Law.

ANNEX 5. INTERNATIONAL COMPETITIVENESS

1. As Mongolia is competing with countries in Asia and elsewhere to attract investment to the capital-intensive mining sector, it is important that its tax regime be internationally competitive by embracing best practices. In assessing the international competitiveness of Mongolia's tax regime, it is helpful to undertake qualitative and a quantitative analyses of the tax regime.

OBJECTIVES OF A MINERAL TAXATION REGIME

2. Building an optimal mineral taxation regime is not a simple task. Ideally it should:
- Encourage profitable exploitation of as many deposits as possible
 - Provide for a fair participation by the state in the fruits of mining enterprises
 - Be stable over time
 - Be transparent and provide a level playing field for all players
 - Be easy to understand and administer
 - Be internationally competitive.
3. Government policies often conflict with these idealistic objectives, so that the actual mining tax regime is less than optimal. The mining tax regimes summarized in Appendices I and II reflect a number of best practices in the context of mineral taxation policy that can serve as useful benchmarks for assessing the international competitiveness of Mongolia's tax regime.

CHARACTERISTICS OF THE MINING SECTOR

4. An internationally competitive mining tax regime should recognise the unique characteristics of the mining industry:
5. High risk. Relative to most other industries, the mining industry is characterized by high risk. This risk is present at all stages of the project's life cycle, including the exploration, development, and production stages. A tax regime can recognize the relatively high risk that is faced by the typical mining enterprise in a number of ways:
- Permit the mining enterprise to reap a reward that is commensurate with this risk. The type and level of taxes that are imposed on the mining enterprise have a direct bearing on the rate of the enterprise's return on capital. As a general rule of thumb, the base (minimum) return on investment that will be sought by investors in a mining project is in the 15 to 18 percent range, depending on country risk and other factors. As indicated in Annex Tables V.1 and V.2, which show the returns on a hypothetical large-scale base metal mine and a small-scale gold mine, generally speaking Mongolia's tax regime appears internationally competitive. However, as indicated in the discussion below, the components of Mongolia's tax regime are delicately balanced. For example, the six-year exempt period that can apply to the mining sector is an integral part of the regime, particularly in light of the relatively high corporate income tax rate (40 percent).
 - Provide for certainty of tax rules. The investor's decision to proceed with a project is largely based on a bankable feasibility study. The feasibility study is based on some important assumptions regarding metal prices; production levels, operating costs, taxes, and other important variables. Once the project is up and running, the continued viability

of the project is a function of these variables. If the variation of taxes over project life can be minimized³ that is, if the tax regime is stable³ there is one less variable to threaten the enterprise. One risk factor is either reduced or eliminated.

- A number of countries have adopted tax stabilization mechanisms, including Argentina, Chile, Indonesia, Kazakhstan, Peru, and Uzbekistan. By reducing the risk of the mining project, a tax stability agreement can help to reduce the financing cost of the project, thereby making the project more economically viable. Tax stabilization mechanisms are particularly helpful in the case of a country that does not have a track record of legislative stability. Stability agreements work best when these agreements are transparent, and there is a level playing field for all investors. A tax stabilization mechanism that is not transparent can be counterproductive: political adversaries, local communities, and other investors, for example, become suspicious of 'special deals' where the process is not transparent, and can become antagonistic.
- Mongolia's tax stability agreement mechanism is an important component of the fiscal regime, since Mongolia does not have a track record of stability in its tax legislation. However, the country's tax stabilization mechanism may be deficient in some respects, as this mechanism is still relatively new to Mongolia,¹²⁰ and there is a concern that the process is not transparent. There is also evidence that tax inspectors and other government officials do not properly understand the existence and relevance of stability agreements, and consequently these officials are not honoring the agreements.

8. *The mining sector is capital intensive.* Substantial amounts must be spent annually on exploration to discover sufficient ore to replace the ore that is currently consumed. Today, a world-class base metal mine can typically cost in the range of US\$2 billion to bring into production.

7. A country's mining tax regime can recognize the capital-intensive nature of the industry in a number of ways.

- Allow the enterprise to generate sufficient after tax cash flow in the early years of production to service project debt, and facilitate non-recourse financing.
- One of the important criteria considered by lenders is 'payback.' A lender will want to minimize its exposure to project risk by being repaid as quickly as possible.
- Mongolia's six-year tax exempt period and relatively generous depreciation rates for machinery and equipment in the corporate tax system help to keep the level of corporate income taxes low in the early years of project life, and thereby serve investor's needs in terms of 'payback.' The global trend is away from tax holidays. This trend has been accompanied by a trend towards adoption of accelerated depreciation, and lower tax rates, which serve the need to generate cash flow in the early years of production.
- Minimize the imposition of customs duties, VAT, and similar up front costs that are a function of capital investment. The imposition of 15 percent VAT and 5 percent customs duty on the importation of capital equipment can, in effect, add up to 20 percent to the cost of a project. These charges could add \$200 million to the cost of a \$1 billion project, and could render the project uneconomic.
- Mongolia has exempted VAT and customs duties on the importation of 'heavy equipment'. However, in the gold mining sector, this benefit is somewhat diminished by the provision in the VAT law whereby gold producers are not entitled to VAT refunds on other purchases of goods and services.

¹²⁰ Only three stability agreements have been entered into by mining companies.

- Avoid the imposition of taxes on capital. Some jurisdictions impose an annual capital tax. For example, a mining enterprise in Canada must pay an annual tax on the aggregate amount of the enterprise's debt and shareholders' equity. This tax is a corporate 'minimum tax' that is intended to ensure that every corporation, including unprofitable ones, pays some amount of tax each year. Currently, Mongolia does not impose such a tax, and should avoid such taxes to remain internationally competitive.

8. The mining sector is a price taker. The prices of most mineral products are established by the interaction of supply and demand in the global marketplace. The mining enterprise does not set the price for its product.³⁴ enterprise is a 'price taker.'

9. A mining tax regime will be relatively attractive if it minimizes taxes that are not based on profits. Because the mining enterprise is a price taker, the cost of such taxes cannot be passed onto the mining enterprise's customers. The enterprise has to bear the burden of these costs, even though the enterprise may not be profitable currently. This burden can have a notably adverse impact on the economics of a project, its cash flow and its ability to access credit markets.

10. Mongolia's mineral royalty is not a function of profit, and cannot be passed onto the mining company's customers. The entire burden of this royalty must be borne by the mining enterprise. The 7.5 percent royalty borne by placer miners is very high by international standards (see Appendix III).

11. The mining sector's profits are cyclical. Most metal prices show wide swings over the years, and the typical mining enterprise's profits will reflect, and depending on its capital structure, accentuate these price cycles. It is common for even the largest mining companies to record losses for a number of consecutive years during cyclical troughs in metal prices.

12. The mining tax regime can recognize the cyclicity of the industry by providing adequate loss carry-over periods in the income tax system, and possibly in the country's mineral royalty system, too. The absence of a loss carryover provision in the corporate income tax law means that the government collects income taxes in the 'good' years when high metal prices generate substantial profits, but the government provides no relief from income tax in the 'lean' years when low metal prices cause losses.

13. All of the countries in Annex II have loss carryover rules in their income tax systems. Some countries, Australia for example, have indefinite loss carry forward periods. Two countries in Appendices I and II (the United States and Canada) allow losses to be carried back for offset against taxable profits in prior years. The ability to carry losses back to prior years offers the optimum 'income smoothing' to counter the cyclicity of mining profits.

14. Mongolia's corporate income tax law does not provide for the carryover of tax losses, and therefore is not internationally competitive in this respect.

15. The mining sector is generally centered in remote locations. Invariably, ore bodies are found in remote locations. Consequently, in most instances the mining project involves substantial infrastructure costs. In the past, the mining enterprise was often expected to pay for access roads, electric power facilities, port facilities, and social infrastructure such as medical clinics, school, and recreation facilities. However, the current trend is for investors to resist these expectations.

16. A mining tax regime can recognize these higher costs by providing generous tax depreciation rates for infrastructure costs. Canada, for example, allows infrastructure costs that are incurred during the pre-production period to be depreciated for tax purposes at a 100 percent rate. It is not clear in Mongolia's corporate income tax law as to how such costs are to be depreciated.

17. The mine has a finite life. Unlike a manufacturing plant or a service business, a mining project has a finite life, because its mineral reserves are finite. This means that the enterprise has a limited number of years over which to realize a competitive rate of return on its investment.

18. The feasibility study, on which the project investment decision is made, takes into account the entire life of the project, and must assume that the tax regime will not change significantly during the project's life. A change to the tax rules part way through the life of the project could jeopardize the viability of the project and result in it being shut down.

19. Whether a country seeks to build stability into its mining tax regime through either legislation or contract, the important consideration is that the country honors its commitment to stability. Unless the country has a proven track record of stability, the mining enterprise will view promises of stability with some suspicion. And, once the country has established a track record of stability, it should be careful to preserve that record at all costs.

20. Mongolia has changed its tax laws frequently over the past several years. This rate of change can damage the country's reputation for tax stability, despite the existence of stability agreements.

21. The mining sector has significant restoration and reclamation obligations. There is a trend in the regulatory climate to charge the mining enterprise with stricter responsibilities for environmental externalities, site restoration and reclamation, and ultimately mine closure.

22. The modern mining tax regime recognizes these increasing responsibilities by providing tax relief when funds are deployed, set aside or otherwise reserved during the production stage for reclamation, restoration, and mine closure. In fact, very few mining tax regimes adequately address this topical issue. In Australia, for example, restoration and reclamation costs can be deducted for income tax purposes only when the costs are actually incurred. Canada and Indonesia allow a tax deduction when funds are set aside in advance for the purpose of mine reclamation and closure. The United States permits a tax deduction when a reclamation reserve is set up in the books of account, provided that a prescribed third party certifies the appropriateness of the reserve.

23. Mongolia's tax law does not address this important feature of the mining sector, even though Article 29 of the Minerals Law of Mongolia prescribes comprehensive requirements to ensure that the licensee fulfils its environmental obligations, including making deposits to special bank accounts.

24. The mining sector exploits mineral resources that are, with few exceptions, owned by the state. In most jurisdictions the ownership of minerals vest in the state and mining enterprises are given the exclusive right to mine, process and market specific minerals of economic interest. The mining enterprise in return is obligated to pay some form of economic rent to the government as a consequence of the government's ownership of the resource. Depending on the nature of the economic rent, this tax can represent a significant component of the enterprise's total tax burden.

25. The most common form of economic rent is a royalty. Generally speaking, there are three basic types of royalty:

- Gross royalty, where the royalty is determined with reference to the volume (tonnage, for example) of production, or is determined with reference to gross revenues;
- Net smelter return (NSR) royalty, where the royalty is expressed as a percentage of the enterprise's NSR¹²¹; and

¹²¹ NSR is generally defined to be gross revenues, minus shipping, smelting, refining, and marketing costs.

- Net profits interest (NPI) royalty, where the royalty is calculated as a percentage of net profit.

26. Indonesia offers an example of a gross royalty that is based on the volume of production. For example, in Indonesia's 7th Generation Contract of Work, the royalty payable on gold production is US\$225 per kilogram where annual production is less than 2,000 kilograms and US\$235 where annual production exceeds 2,000 kilograms.

27. Examples of gross royalties that are based on gross revenues can be found in China, Ecuador, the Philippines, and Vietnam.

28. Papua New Guinea offers an example of an NSR royalty and a number of Canadian provinces offer examples of NPI royalties.

29. The royalty systems in some jurisdictions are hybrid systems. In Canada, for example, the annual royalty paid in the Province of New Brunswick is the greater of: 2 percent of NSR; and, 16 percent of net profit. As a policy matter, the purpose of the 2 percent NSR is to ensure that a royalty is paid by the mining enterprise in years when there is production but no profit.

30. Not every country imposes a mineral royalty or collects an economic rent. Mining operations in Peru, Mexico, and Chile, for example, are not subject to such charges.

31. In practice, there is a direct correlation between the royalty rate and the type of royalty. Gross royalty rates tend to be in the 2 percent to 5 percent range, NSR royalty rates tend to be somewhat higher, and NPI royalty rates are higher still. This correlation also exists in the case of private royalties, and there is a logical reason for it. In the case of the NPI royalty, the government is less certain of collecting a royalty, because the royalty base (profit) is less predictable. The government will seek a higher royalty rate to compensate for this risk. At the other extreme, in the case of a gross royalty, the government is at less risk, because the costs of mining, milling, smelting, and refining do not affect the royalty base (revenues or production). Therefore, the government will seek a reduced royalty rate. NSR royalties fall between gross royalties and NPI royalties on the risk and rate scale.

32. Mongolia's 2.5 percent royalty is internationally competitive, but the 7.5 percent royalty imposed on placer gold operations is not.

GLOBAL COMPARISON

33. In determining whether to bring a mineral deposit into production, a mining enterprise will consider, inter alia, the project's internal rate of return (IRR). The IRR indicates the rate of return generated by the project for the investors.

34. Annex Table V.1 shows the IRR on a hypothetical, large-scale base metal mine developed in five different countries. The hypothetical mine used in this model is typical of the kind of mine that could be found in any of these countries.¹²² The model holds revenues and costs constant for each country, so that the only variable is the country's tax regime. Accordingly, the IRR in Annex Table V.1 is a good indicator of the relative impact of each country's tax regime on the project's IRR.

35. The IRR in Chile is highest for two reasons. First, Chile does not impose a mineral

¹²² These countries were selected for comparison for the following reasons. Chile is generally cited as the best model for the modern development of a successful mining sector. Canada has a mature and successful mining sector that is based on laws, which reflect many decades of experience. Indonesia and PNG are two Asia Pacific countries that have excellent geology, and are actively competing against Mongolia to attract investment to their mining sectors.

royalty, whereas the other four countries in the table charge mining operations with mineral royalties. Second, Chile's corporate income tax rate is only 15 percent. In analyses of this nature, Chile is consistently the most attractive country from a tax perspective, and consequently has been particularly successful in attracting investment, developing its mineral resources, and achieving above average growth.

36. The IRR in Indonesia is lowest, mainly because Indonesia's royalty is based on the volume of production, and therefore is not sensitive to metal price or costs and expenses.

37. Based on the modeling results shown in the table, Mongolia's tax regime is competitive with the regimes in PNG and Canada. It will be appreciated, however, that the model assumes that the project is eligible for Mongolia's six-year¹²³ tax exemption from corporate income tax. If the six-year exemption were not available, the IRR would be a non-competitive 12.29 percent instead of a competitive 17.18 percent. In the case where there was no six-year exemption, a reduction in the corporate income tax rate from 40 percent to 20 percent would restore Mongolia's tax regime to international competitiveness. Similarly, if the six-year exemption were not available, a 25 percent corporate income tax rate and a 1.5 percent royalty (instead of 2.5 percent) would maintain the competitiveness of the regime. This indicates the importance of maintaining the six-year exemption in a regime that includes a relatively high 40 percent corporate income tax rate and a 2.5 percent royalty. This point also serves to illustrate that Mongolia's tax regime is very delicately balanced, and a change cannot be made to one component of the regime without modifying another component or other components, if international competitiveness is to be maintained.

Annex Table V.1 Large-Scale Base Metal Mine

Country	IRR (%)	Government Share (%)
Chile	18.3	16.7
Mongolia	17.2	32.8
Papua New Guinea	16.9	38.6
Canada (Ontario)	16.4	41.7
Indonesia	15.00	39.7

Source: Bank **Staff Estimates**

38. The government share in Table V.1 shows the amount of taxes collected by the government as a percent of pre-tax cash flow generated by the project i.e. effective tax rate. When formulating tax policy, a government must be careful not to stray too far from international norms with respect to government share. Although Canada's government share is relatively high, a substantial portion of Canadian taxes are collected in the latter part of mine life, due to 100 percent tax depreciation allowances and royalty exemptions during the first three years of production. Thus, the IRR of a mine in Canada is not as heavily impacted by the higher tax rates in that country.

39. Annex Table V.2 shows the IRR and government share for a hypothetical small-scale hard rock gold mine. The Mongolia model for the non-placer operation is based on a 2.5 percent royalty and eligibility for the six-year tax exemption. Based on this model, Mongolia's tax regime is internationally competitive.

¹²³ Three-year exemption from corporate income tax, plus three-year 50 percent reduction of corporate income taxes.

Annex Table V.2 Small-Scale Gold Mine

Country	IRR (%)	Government Share (%)
Chile	17.0	16.7
Mongolia (non-placer) ¹²⁴	16.4	26.8
PNG	15.5	36.3
Mongolia (placer)	14.00	40.1
Canada (Ontario)	13.6	43.0
Indonesia	12.1	48.6

Source: Bank *Staff Estimates*

40. If the non-placer gold mining project was not eligible for the six-year exemption, the IRR would decline from 16.4 percent to 12.0 percent and become unviable. Further, if the mine model represented a placer gold mine¹²⁵ instead of an open pit or underground mine, the IRR would be 14.0 percent where the mine was eligible for the six-year exemption, and 8.6 percent where the mine was not eligible for this tax exemption. The 7.5 percent royalty that applies to placer mining has a distinct adverse impact on the economics of such operations. This royalty rate is not internationally competitive. (See also Appendices I and II, which show the royalty rates imposed in selected countries.)

EXPECTATIONS FOR GROWTH IN TAX REVENUES

41. Mongolia's government has identified the mining sector as a priority industry for contributing to future growth in the economy and tax revenues. In 2001, the mining sector accounted for approximately 9 percent of the government's total tax revenues. Three large mining companies¹²⁶ confined to three minerals, gold copper and molybdenum, accounted for 95 percent of all taxes paid by the mining sector in 2001.

42. The experience in many mining communities around the world is that there is often a gap between the community's expectations of a mining enterprise, and the enterprise's capacity to deliver those expectations. Often, the community sees a great deal of economic activity during the exploration and development phases of a project, without realizing that it will be many years before the project starts to generate significant tax revenues that benefit the country and the community. Further, as confirmed by the fact that only three mining companies in Mongolia pay 95 percent of all taxes paid by the mining sector, mainly medium- to large-scale mines normally generate significant tax revenues.

43. Typically, it can take at least three years to finance and develop a large-scale mine following the completion of exploration and a bankable feasibility study. Further, it may take several years before the project starts to pay income taxes or mineral royalties. For example, in the case of the hypothetical mine that serves as the basis for the data in Table V.1, no corporate income taxes are paid until the fourth year of production in the case of Chile, Canada, and Mongolia, the third year of production in the case of PNG, and in the second year in the case of Indonesia. This de-coupling of tax collections and operations is attributable to accelerated depreciation rates, or tax exemptions, or both.

¹²⁴ The IRR of 16.4 percent is based on a model where the mining enterprise does not bear any VAT on purchases of goods and services. If the enterprise had to bear 25 percent of the VAT paid on imports, and full VAT on other purchases of goods and services, the IRR would be 13.7 percent instead of 16.4 percent.

¹²⁵ As indicated in the Overview of Tax Law, a placer gold mine is subject to a 7.5 percent royalty instead of the standard 2.5 percent royalty.

¹²⁶ Erdenet, Shijir Alt, and Altan Dornod.

44. It is the norm, then, for governments not to collect corporate income taxes until six or seven years after the start of mine development. On the other hand, royalties that are a function of production, as compared to profit-based royalties, generate revenues for the government starting with the commencement of production. It is important that the central and local governments, and communities, recognize this particular feature of the mining sector when planning for economic growth and community development.

45. Timing issues aside, the mining sector can make an important contribution to Mongolia's growth in tax revenues. A large-scale mine can generate significant corporate income tax revenues and royalties over the life of the mine. For example, the mine used in the analysis above, which has a capital cost of US\$636 million, generates corporate income tax revenues aggregating US\$337 million, and royalties aggregating US\$173 million, over its twelve year life. On an annualized basis, the mine generates US\$28 million in annual corporate income taxes, and US\$14 million in annual royalties. If such a mine was brought into production in Mongolia, the country's annual income tax revenues derived from the mining sector would triple, and royalty revenues would double, using 2001 tax collections as a base.

CONSTRAINTS TO NEW INVESTMENT AND MINERAL DEVELOPMENT

46. Based on a review of Mongolia's tax system as it applies to the mining sector, and based on experience of international best practice, it is recommended that government address the following potential constraints to medium to long-term growth in tax revenues derived from the mining sector. These constraints may be summarized as follows.

- The 7.5 percent royalty that applies to placer mining is not internationally competitive. Mongolia's mineral tax regime would be improved if this royalty rate were reduced to 2.5 percent, the rate imposed on all other mineral production.
- Gold sales are exempt from VAT. As a result, gold producers are not entitled to VAT refunds and must therefore bear the burden of the VAT that they pay on their purchases of goods and services. Consequently, gold producers' capital costs and operating expenses can be up to 15 percent higher than they would be if they were operating in competing countries. Mongolia's tax system would be improved if the government repealed this particular VAT rule, which runs contrary to international norms.
- The GDNT has proposed an amendment to the law whereby only producing companies would be permitted to register for VAT purposes. This means that companies in the exploration and development phases would not be entitled to VAT refunds. This would increase the cost of exploring and mining in Mongolia, and thereby present a barrier to investment in the sector. Such a VAT provision would not be consistent with international best practices: the VAT laws of other countries allow non-producers to register for VAT purposes.
- At present, all taxes are paid to the central government. In the mining sector, it is important that local communities that are affected by mining operations see that their communities benefit directly from such operations. With reference to international best practices, a preferred way to achieve this is to have at least a portion of mineral royalties paid directly to the local government.
- Stability agreements play an important role in Mongolia's mining sector. The government must be mindful that, based on the experience of other countries, stability agreements can be counterproductive if they are not handled in a transparent and consistent manner, and in accordance with clear guidelines. Also, the importance and relevance of Stability

Agreements should be promoted among tax officials and their staff, and suppliers to the mining sector, to ensure that these Agreements are honored in the course of tax audits, collections, and withholding.

- To plan and monitor a competitive fiscal regulatory environment for the mining sector, the government needs to have information about the taxes paid by the mining sector and sub-sectors. At present, statistical information concerning tax collections from the mining sector is difficult to obtain and is unreliable.
- Investor confidence in the administration of the tax system would be improved if some changes were made to tax provisions. These include:
 - The corporate income tax law should include a loss carryover provision that is consistent with international best practices;
 - The corporate income tax law should prescribe the tax treatment of exploration and development expenditures. These expenditures can be substantial, but the current law does not address the tax deductibility of these expenditures;
 - The tax treatment of mine reclamation and closure costs should be addressed in the corporate income tax law; and
 - The corporate income tax law should confirm the deductibility of mineral royalties in determining taxable income.

ANNEX 6. REVENUE MANAGEMENT

1. Mongolia's 2002 Public Sector Management and Finance Act (PSMFA) regulates the budgetary process and distribution of government revenues and provides for a highly centralized system of tax collection and expenditure. Previously, the system was more decentralized but considerably less transparent. It is not surprising that the move to a more centralized revenue management system met with considerable resistance from local government.

2. One of the main reasons for this direction is to enable the central government to obtain a better sense of the revenue raising capacity and needs of local governments. Once these capacities and needs are better understood, possibly in one or two years, it is intended that the mechanism for redistribution of government revenues be reconsidered. It is largely due to this temporary nature of the existing revenue management system that local governments' initial resistance moderated. There is an expectation that, within the next few years, local government may regain some degree of control over certain components of revenue management.

3. A local government's budget is initially developed and approved at the local government level. This budget is consolidated with those of the relevant central government ministries. The ministry's consolidated budget then goes through an approval process set out in the PSFMA. In effect, then, the local government's budget is subject to a strenuous approval process that includes the Cabinet and Parliament. Funds are transferred from the central government to the local government based on the ministry's consolidated budget as finally approved by Parliament.

4. Virtually all taxes, with minor exceptions, are remitted to the central government. These taxes are not earmarked for specific purposes, but become part of a general revenue account that is used to fund central and local government budgets. This process, however, ignores the volatility of commodity prices and the unique characteristics of mining related fiscal receipts, and will need to address local economic development and equitable revenue sharing arrangements, deal with the inevitable boom-and-bust cycles relating to price instability, enhance governance and transparency at the regional and local level, and ensure sustainable development beyond the life of mineral deposits.

REVENUE SHARING

5. Mineral royalties are now paid to the central government, and become part of this general revenue account. In the mining sector, the issue arises as to whether mineral royalties should be paid to the central or local governments, where the mineral resource is located, or some combination. Arguments that are typically advanced in favor of either of these choices include:

In favor of payment to the central government.

- The resource 'belongs' to all of the country's citizens, and therefore should benefit all citizens equally¹²⁷
- Payment of the royalty to the local government creates "have" and "have not" provinces that create significant different levels of income and wealth within the country. This situation can be avoided by having mineral royalties paid to the central government
- Allocation problems that arise when a mineral property straddles the border of two or more local governments.

In favor of payment to the local government.

- The resource belongs to the local jurisdiction's people, and therefore should benefit only those people;

¹²⁷ In some cases ownership of the country's mineral resources is set out in its constitution.

- Where the local government is responsible for providing health services, education, and other infrastructure, the development of a major mining project can create demands for major local government expenditures. Royalties can serve to fund these expenditures;
- A mining project has a finite life. The payment of royalties to the local government enables that government to provide incentives and facilities that will attract economic activities that out live the mine, and reduce the adverse economic impact of the mine's inevitable closure; and
- From community and labor relations' perspectives, it can be preferable that the mineral royalties be seen to go direct to the local government rather than to the central government.

ADJUSTING TO BOOM-OR-BUST CYCLES

6. Commodities prices, in general, but metal prices, in particular, are subject to positive and negative shocks leading to boom and bust cycles. The risk that mineral boom-and-bust cycles lead to similar cycles to the economy as a whole is greater for mineral-dependent economies such as Mongolia, where 60 percent of its exports were ore and metals in 1999.¹²⁸ In 1996-97, for example, export prices for Mongolia's main commodities fell sharply, accentuating inadequacies in public expenditure management¹²⁹.

7. Recent studies of commodity prices variability have found two crucial results. First, the volatility of commodity prices has increased to the point that trends in real commodity prices are overwhelmed by the variability of prices.¹³⁰ Second, metals typically have long-lasting shock prices and the variability of their persistence is wide.¹³¹ This implies that, on the one hand, shocks in metal prices cannot be considered transitory for policy purposes; and, on the other hand, the duration of shocks cannot be anticipated with a reasonable degree of confidence. The tin prices are a good example. In the middle of the 1980s tin prices dropped by more than 50 percent, most specialists in the tin market such as the London based Commodity Research Unit predicted a recovery by the first half of the 1990s, when the excess stocks were expected to be absorbed by the market. Not only was this prediction unfulfilled but also tin prices continued their declining throughout the 1990s. Thus, the conclusion is that the negative shock in tin prices should have been considered permanent and that the best predictor of the tin price is today's price.

8. The main implication of such behavior of metal prices is that price stabilization mechanisms and compensatory financing are likely to be ineffective. Consequently, for a mineral based economy that experiences a shock in metal prices, the best policy response to the shock would be to adjust the economy to the new price level. The key issue becomes, therefore, how to adjust the economy to minimize any negative impact or optimize any positive impact on the economy's long-term growth. Policies or programs that lead to fiscal unsustainability, unproductive investments, rent seeking behavior and Dutch disease effects should be avoided. To this end, the cases of Botswana, Nigeria, and Trinidad and Tobago are useful examples for the right and wrong directions of policies for revenue management in developing countries.

¹²⁸ Eggert, R. (2002), Table 2.1, pp: 15-16

¹²⁹ In the PEFMR (2003) of Mongolia is reported that gold prices fell 42.5%, copper by 28%, and cashmere around 12.5%. Large revenue shortfalls resulted as corporate income tax and dividend payments from major SOEs dried up.

¹³⁰ Cashim, P. and J. McDermott, (2002) using the longest dataset publicly available analyzed the behavior of real commodity prices over the period 1862-1999

¹³¹ Cashim, P., Liang, H. and J. McDermott, (2002) examine the persistence of shocks to world commodity prices, using monthly IMF data in primary commodities between 1957 and 1998.

Box VI.1: Revenue Management in Botswana and Trinidad and Tobago

The diamond boom in Botswana, which began in 1965, was due to the discovery and development of large amounts of high quality diamonds, not a price increase. From 1966 to 1989, Botswana's annual GDP growth rate of 8.5% was the highest of any country in the world. From 1990 to 1999, its GDP per capita growth rate of 2.5% was only lower than Sudan in South Saharan Africa. Botswana has not been affected by Dutch disease. In the 1980s, its manufacturing production even doubled with manufacturing employment growing to the point where it was three times as large as mining employment. There was a significant rise in construction prices in the late 1980s, but there was no spillover of inflation to the rest of the economy or the foreign exchange rate.

The reasons for Botswana's successful management of the diamond boom are not difficult to find. First, a large part of the windfall was put in foreign savings and only used when the absorptive capacity of the economy was deemed sufficient. Government spending policy paid close attention to two constraints: the availability of skilled manpower, and the future recurrent costs of development spending in relation to revenue forecasts. Second, very close attention was paid to the foreign exchange rate. On one hand, via management of the windfall savings, it was not allowed to appreciate widely. On the other hand, to help manage inflationary pressures caused by the boom, appreciation of the Botswana's pula was allowed periodically. Third, the government never went on an investment-spending spree, except for a brief period in the late 1980s. When revenues from diamonds fell dramatically in 1981-82 due to a drop in prices, the government responded quickly. Domestic credit growth was cut dramatically, interest rates were increased, wages and salaries were frozen, and the pula was devalued by 10 percent. The policies were generally successful and the drop in GDP was only 2.4 percent despite a 16 percent drop in total export revenues and 43 percent drop in diamond revenues.

Unlike Botswana, Trinidad and Tobago used the oil windfall for fully implementing an import substitution strategy, and in 1975 it began a plan of gas-based industrialization. Shortly after, the government began to use part of the windfall to acquire a large number of declining industries. Public pressure to share the benefits of the boom also led to large consumer subsidies for food, fuel, and utilities. By 1981, these were equivalent to five percent of GDP. The political difficulty in cutting back on these subsidies was an important element in the economic collapse of Trinidad and Tobago in the 1980s, when annual GDP growth was -2.5 percent.

The second oil windfall was equivalent to 34.7 percent of non-mining GDP from 1979 to 1981. A large portion was used for further industrial investment, although few additional declining industries were acquired. Subsidies to consumers and the loss-making enterprises acquired with the first windfall also ate up a large portion of the windfall. Unfortunately, most of the new investment was very unproductive due to very large cost over-runs during construction and poor implementation after completion. Trinidad and Tobago suffered from an unproductive investment boom led by the public sector. The use of the resources for new investment was part of the government's industrialization strategy. Their deployment to buy existing firms was due to the strength and militancy of the trade unions. In addition to the large increase in public employment, this same power base was able to obtain large wage increases, hastening the demise of the low-wage agriculture sector.

A comparison of the experience of Trinidad and Tobago with Botswana, two small countries with similar booms, clearly reveals that policy choices led to the starkly different results. First, Botswana took into account recurrent expenditures in all of its policy decisions, thus avoiding both fiscal deficits and external debt. Second, it did not undertake investments that were beyond its absorptive capacity, concentrating on small and medium sized projects. Third, it followed a much more prudent exchange rate management policy.

Source: Extracted from McMahon (1997), pp: 27-28 and 30-31

9. In its current situation, Mongolia, in particular is vulnerable to suffer from unproductive investments and rent seeking behavior, which might result in fiscal unsustainability in the long-term unless these weaknesses were tackled.

10. In addition, if shocks are negative, distributional conflicts need to be prevented. If society is divided because of ethnic identity, wealth and income distribution, social classes, etc., the process of adjustment to a lower level of income can deepen society divisions creating conflicts and tensions. Usually, this would result in delaying reforms, political pressures for delaying fiscal and key macro prices adjustments such as increasing interest rates or reduction in real wages, which can affect productivity and growth significantly.¹³² For example, Latin American countries, with the exception of Chile, suffered badly during the 1980s “lost decade” due to this type of conflicts when they were trying to adjust to the debt crisis and negative shocks in commodity prices.

11. For preventing distributional conflicts, institutions of conflict management such as democratic and effectively representative institutions, an honest and non-corrupt bureaucracy and accepted rules and institutions for consensus building should be developed or strengthened. Low-income developing countries are more prone than not to suffer from weak conflict management institutions as they have states not yet fully consolidated and where the division of the executive, legislative and judicial powers is more formal than real. Such cases could lead to small groups to succeed in dominating domestic politics and economics imposing their vested interests above of society’s interest. However, this does not have to be the case, if critical social actors establish an equilibrium system. For example, Mauritius with a highly diverse and fragmented society was able to strike a deal between the minority French community and the majority Indian community that lead to a separation of economic and political power. This allowed the success of sugar industry in Mauritius and an optimal rent-sharing regime, which has supported a well-paid civil service and a generous system of social protection. As a result, Mauritius’ long-term growth performance has been exceptional for any African standards and is quite comparable to the growth performance of the East Asian tigers.¹³³

ENHANCING GOVERNANCE AND TRANSPARENCY AT THE REGIONAL AND LOCAL LEVELS

12. Specialists and practitioners agree that three components are essential for effectively managing mining revenues at the regional and local levels.¹³⁴ First, a partnership approach involving governments, communities and companies is required. This calls for a clear definition of the obligations and responsibilities of each partner. Controversy exists about the need of establishing a specific regulatory framework to achieve this objective. If a regulatory framework is established, there is consensus that flexibility for adapting to the variety of specific circumstances on which mining operations take place should be preserved. Second, meaningful local consultation is necessary for the process to deliver sustainable development. A meaningful consultation process can help build trust and respect between the three parties and can help manage expectations on the part of the community. There is no agreement, however, whether the community should have the right to accept or refuse a proposed mining project. States, in particular, resist sharing their monopoly for granting mining rights with provinces or communities. Third, the need for decentralizing part of mining fiscal revenues is also out of discussion. However, decentralization of fiscal revenues is not free from pitfalls. For example, in the Andean mining economies where decentralization has been established such as in Bolivia and Peru, in a number of occasions timely disbursement of funds is a major difficulty.¹³⁵ Moreover, decentralization only reaches at

¹³² See Rodrik, D. (1998)

¹³³ Subramanian, A. and D. Roy (2001)

¹³⁴ See for example MMSD report (2002), McMahon and Remy (2001), Eggert, R (2002) and Strongman, J (1998)

¹³⁵ In Bolivia, fiscal revenues from royalties go directly to the provincial administrations. In Peru, 50% of the ‘canon minero’—a type of royalty paid to the central government—is returned to the region.

the provincial level; consequently, local communities, especially the most remote ones, could still be left aside of partaking in mining fiscal revenues.

13. Two of the main institutional arrangements for managing mining revenues to promote local development are either foundations, or a sort of development governance board where the main stakeholders are represented such as in the PNG's development forum. Foundations are a company's institutional arrangement to deal with local community development needs in absence of another alternative available. For enhancing the effectiveness and acceptability of foundations, making communities participate in foundations decision-making and priority setting is necessary. In addition, improving access to information on foundations for communities and independent monitoring of foundations' performance are needed to enhance transparency.¹³⁶ Where types of development forums are established, the specific responsibilities of the stakeholders must be clearly identified for enhancing accountability, avoiding mismanagement of resources, rent-seeking behavior and corruption. Furthermore, free access to information, independent monitoring and society's watchdogs should be included in the institutional framework. Of course, for local communities to participate effectively in this process, training and capacity building to organize themselves and represent their interests would be needed from the very beginning.

14. For managing effectively mining revenues, this is another area of concern for Mongolia. The fiscal relationship between the central and provincial government is affected by several problems: (i) a difficulty in establishing the appropriate role and size of local governments in service delivery; (ii) weak accountability structures; (iii) inappropriate matching of expenditure responsibilities with revenues;¹³⁷ (iv) poorly designed transfer systems;¹³⁸ (v) overall lack of comprehensiveness and predictability¹³⁹ of social sector budgets at the local agency level, and, (vi) low incentives for local governments to raise their own revenues.¹⁴⁰ On top of that, local governments have had poor performance levels. Thus, any decentralization process in Mongolia must emphasize matching greater and predictable resources at provincial level with the corresponding accountability and responsibility for managing those resources. For delivering sustainable development at the regional and local levels, therefore, a major effort on fiscal capacity and institutional building will be required.

ENSURING SUSTAINABLE DEVELOPMENT BEYOND MINE CLOSURE

15. A certainty for a mine is that its reserves some day in the future will be depleted and mining activities will cease. The impact of depletion is more acutely felt in local communities than in regions because regions usually are mining provinces and for one mine closed, at least, another is opened. Unlike regions, local communities only exceptionally have this benefit and for

¹³⁶ Ross, M (2001) suggests "firms should disclose complete information about the payments they make to host governments, including both regular payments (such as royalties, taxes and revenue sharing) and irregular payments (such as signing bonuses); and any payments they make or programs they fund, for local communities. Host governments should make similar disclosures about all revenues they receive from extractive firms. Such disclosures should encourage both firms and governments to be more responsive to popular concerns."

¹³⁷ "While Mongolia has taken significant legislative steps to increase the taxing power of local jurisdictions-most notably by allowing provincial land and property taxes in 1999-the gap between local revenues and expenditure obligations remains wide. Very high national tax rates leave little scope for raising local rates." (PEFMR, 2003, pp: x&xi)

¹³⁸ "In Mongolia expenditure transfers are allocated based on informal negotiating processes with local officials. Evaluation of transfers is based on ministry revenue estimates and the intended expenditures of local governments. (PEFMR, 2003, pp: xi)

¹³⁹ "The system of tax sharing is unclear, and changes from year to year, making it difficult for local governments to predict what resources they will receive." (PEFMR, 2003, pp: x)

¹⁴⁰ "Perhaps the most serious issue that arises in the current system is that it gives localities an incentive not to increase revenue collection. Indeed increased revenue collection by local governments is frequently punished. Any increase in local revenues is offset by reductions in either the tax sharing rate or transfers. The system encourages regions to find extra-budgetary sources of income that will not affect their revenue assignments in the subsequent year." (PEFMR, 2003, pp: 90)

promoting development a large mine is their opportunity of a lifetime. Accordingly, what would happen after mine closure is of great concern at local level.

16. For contributing to sustainable development after mine closure, part of the mining benefits—including revenues—should become renewable wealth. One way of dealing with this challenge is by increasing the social and human capital of local communities that is usually the most important component of the community development plan implemented through foundations or the development forum's governance board. Accumulating such capital would significantly enhance a community's capabilities to develop sustainably over time. Another way of promoting long-term sustainability is including within the community or regional development plan resources for the promotion of business unlinked to mining operations with the objective of diversifying away of mining activities. Although a very tempting idea, it should be approached with caution. Evidence suggests that this would be one way of squandering mining wealth¹⁴¹. Finally, another alternative is a fund invested in assets that earn income, which complements very well the accumulation of human and social capabilities, because it ameliorates the economic impact of closure. Recurrent costs for infrastructure maintenance and the provision of education and health services could be financed with the income earned by trust funds. There is evidence that a trust fund managed at arm's length from politicians would be a useful alternative for obtaining permanent income from non-renewable natural resources.

17. In conclusion, for promoting community or regional sustainable development after mine closure is suggested that a portion of revenues from mining to be invested in both the accumulation of human and social capital, and in a trust fund. After mine closure, income generated by the trust fund should be used to cover the recurrent costs of maintaining infrastructure and for keeping the quality of the human and social capital accumulation activities in the region.

POLICY CONSIDERATIONS

18. From the analysis above, there are three main areas of policy to be considered for the management of mining revenues to make the mining sector an engine of growth for Mongolia: (i) macroeconomic policies, (ii) policies for institutional building and strengthening, and (iii) regional and local development policies.

19. **Macroeconomic Policies:** The main thrust of the macroeconomic management is to prevent a spending spree by the public and private sectors in response to a significant expansion of mining revenues due to an increase in metal prices and/or a large increase in mining production. To this end, allowing the public and financial sectors to invest in foreign financial assets should offset the economy's absorptive constraints. This is not to say that the financial sector should be fully liberalized but that some degree of financial freedom can be allowed without compromising the economy's foreign reserves and stability of its capital account. This policy would moderate wide fluctuations in the balance of payments and wide swings in private expenditures.

20. The need for a prudent and conservative fiscal policy cannot be overemphasized. Thus, the program for restoring fiscal discipline and strengthening Mongolia's public finances proposed in the PEFMR is also a necessary condition for the sound management of its mining revenues. This includes the suggestion of formulating a medium-term roadmap for agency restructuring or privatization. As the Nigerian and Trinidad and Tobago cases show, the single largest mistake in managing mining windfalls is to use them for creating or supporting SOEs, or closing the economy for promoting import substitution and protectionist policies. As it happened in Botswana, a practical

¹⁴¹ Christmann, P. and N., Stolojan. (2002) reported that 20-25% of compensation payments from the Porgera mine in PNG went into business developments most of which quickly failed. Loayza, F. et al (2001) found that in the Inti Raymi foundation in Bolivia the least effective programs were those devoted to promote production activities not demanded by the mine.

rule for deciding whether to implement public expenses or investment projects is to keep recurrent costs associated with these projects in line with long-term future fiscal revenues and not exceeding the availability of skilled manpower. In addition, if the government captures most of the windfall, private investment can be promoted by using part of these resources in reducing the domestic public debt increasing the resources available for the private sector through the financial markets.

21. Because of the great variability and long life of metals price shocks, it is neither advisable nor efficient to resort to the use of stabilization funds and compensatory financing for dealing with boom-and-bust cycles. Unless there is great confidence that the shock will be transitory such as in a short war with international repercussions, adjusting the economy to the new price level is generally the right decision. If the shock is positive, a modest appreciation of the real exchange rate should not be a problem and may reflect low-cost productivity gains of the economy. A practical rule will be to follow closely the behavior of the non-traditional exports to watch out for eventual Dutch Disease effects in the economy.

22. *Institutional building or strengthening policies.* For Mongolia's public sector using efficiently and effectively mining revenues, overcoming the existent problems in the relationship between the central and regional government levels is a priority. Again, the adjustments proposed in the PEFMR to clarify priorities and responsibilities through the central budget, to reform the arrangements between central and regional governments and between the government and state enterprises, and to clarify the mandates and jurisdictions of agencies at different levels of government is badly needed. Moreover, the reform proposes also to strengthen local governments by addressing the unpredictable nature of transfers from the central government and by providing them with a significant source of revenue over which they have autonomy. Within this framework, which is compatible with the decentralization of mining revenues, the Mongolian government could explore the possibility of allocating mining royalties directly to the provincial governments that has worked well in Bolivia.

23. For improving the effectiveness in managing booms and in avoiding or minimizing the long-term costs of busts, enhancing institutions of conflict management should also be contemplated within the reform of the Mongolian economy. As in Mauritius, the independence of the political and economic powers should be sought along with the development of democratic institutions. Under such an umbrella, in mining regions such as Orhon, where the largest Mongolian SOE—Edernet—is located, a regional mining forum could be established to involve all mining stakeholders in thinking and discussing on how mining can best contribute to the regional development. A forum of this type could be a place for exchanging information between mining companies and SME suppliers. It could also be a mechanism for persuading mining companies to use their purchasing power for the promotion of SME rather than for encouraging the unbridled competition among SMEs that would keep them fighting for their survival and unable to upgrade their competitive advantage beyond that of low-cost factors, as happened in the mining region of Antofagasta.

24. In addition, for enhancing transparency and accountability of government management of mining revenues and preventing rent-seeking behavior and corruption, civil society entities can be actively encouraged to serve as ombudsmen or watchdogs in several ways. The first is by publicizing examples of wrongdoing and, therefore, raising the political costs of mismanagement. Second, groups outside of government can support individuals and groups within government who oppose rent-seeking behavior and corruption. Third and perhaps most importantly, an independent and strong media by shaping public opinion can significantly increase the political costs of mismanagement and corruption and the likelihood that those behaviors will be punished.

25. *Regional and local development policies.* A comprehensive framework for compensation and benefit sharing that leads to a concerted community development plan is the critical factor in managing mining revenues for local community development. Such framework should establish

the regulations for community compensation and for the process that will lead to a community development plan, including community consultation. In doing so, it should clarify the rights and responsibilities of the central and regional administrations, the mining company and the community. The regulation of the process leading to the community development plan should be flexible enough for accommodating itself to the specificity of each mining project¹⁴²

26. Even strengthened by government guidelines as in Peru, the alternative of keeping compensation procedures under the civil law, consultation constrained to the public hearings established in the environmental impact assessment regulations and benefit sharing through a mining company supported foundation is unsustainable in the long-term. This is because the central government tends to remain distant or little involved in the process, the community would feel alienated from a process that is controlled by the company, and the mining company would not get the community's commitment for not disrupting the project. Therefore, conflicts and tensions between the community and the local community would emerge impairing the efficiency of both the mining operation and the efforts for local community development.

27. Once the institutional framework for promoting community development is defined, the effectiveness of the use of mining revenues depends on the compensation and benefit sharing policies. Compensation will be effective if facilitating the transition of communities to a sustainable new way of life is properly addressed. This calls for training, employment and spin-off business opportunities with the mine for the community; at the same time that for policies to avoid the increase of inequalities within the community. Benefit sharing will be effective if the accumulation of human and social capital by improving the education and health standards of the local population and their collective ability to organize themselves, define their priorities, and represent and negotiate effectively their interests with third parties such as the government is promoted. In addition, establishing a trust fund for covering the recurrent costs of human and social capital accumulation and for maintaining the infrastructure in the local area after mine closure is suggested.

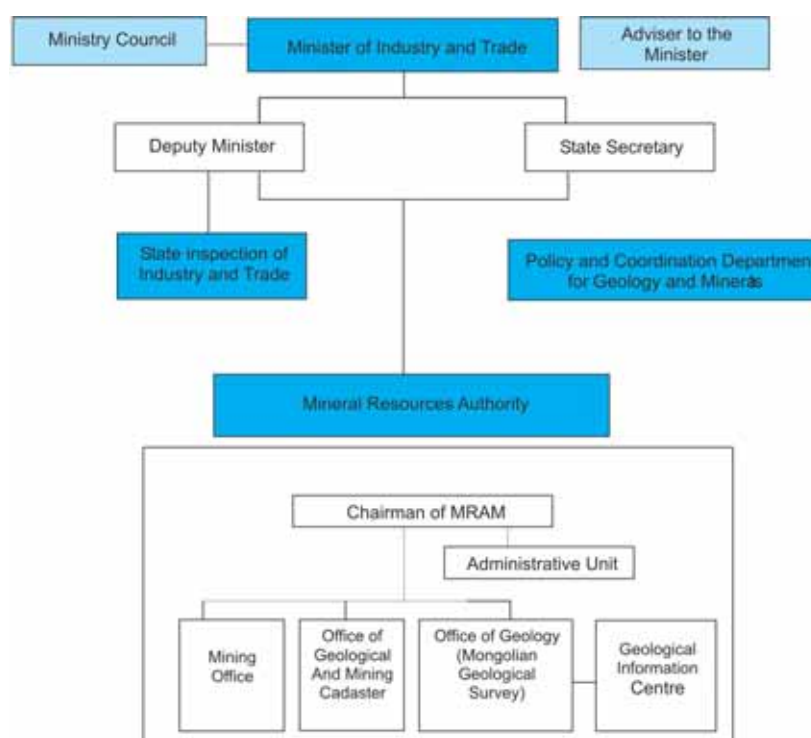
28. If the government assumes the challenge of promoting an advanced comprehensive framework for compensation and benefit sharing for local communities, it would be among the pioneers in the world in dealing with this critical issue of mining development. Far from disadvantaging its minerals industry, the government may attract foreign direct investment because of such policy. As the history of the establishment of environmental regulations in developing countries demonstrates, pioneering strict or advanced standards do not discourage responsible mining foreign investment but give the country's industry a competitive edge as the regulations become progressively global.

¹⁴² In the opinion of Eggert, R. (2002, p: 58-59) "the challenge is designing a process that is efficient, equitable (or fair), and predictable—efficient in the sense that the process results in appropriate public participation at lowest cost in terms of time and expense; equitable in that the process gives each interested party to mineral development, owners as well as other community members, an appropriate opportunity to be heard; and predictable in that the process itself is understood by all parties (that is, a clear understanding of who can participate, what are rules for discussion, on what basis will decisions be made, and so on.)"

ANNEX 7. OVERVIEW OF MINERAL SECTOR POLICY AND LEGISLATION

1. The Ministry of Industry and Trade (MIT) has the broad mission to provide the framework for national industry to prosper, increase exports and ensure economic growth of the country. One of MIT's priority objectives is the management of the mineral sector. This Ministry is therefore responsible for directing government's national economic development policies on minerals and related geoscientific research. It does this primarily through two minerals-focused institutions (Annex Figure VII.1).

Annex Figure VII.1 Institutional Structure of MIT



2. MIT's internal Department of Geology, Minerals Policy and Coordination has responsibility for establishing the legal basis, standards and norms for mineral policy objectives. The Mineral Resources Authority of Mongolia (MRAM) is the external lead agency directly responsible for implementing the licensing, information management and promotional research functions arising from national mineral policy directives.

NATIONAL MINERAL POLICY

3. Although no national mineral policy had been formulated at the time of enactment of the 1997 Minerals Law, the necessity of establishing overriding policy guidelines integrated with national socio-economic objectives was clearly recognized. A May 2002 policy document establishes the development of the minerals sector as a priority area with clear objectives and annual targets.¹⁴³ This document outlines many important mineral policy objectives and is designed to act as an action plan stating mineral development and sector promotional goals to be reached over 2002-10.

4. There is much to be commended within these guidelines to reach the government's goal "to develop and promote export-oriented industries and bring the country's economic growth to 6

¹⁴³ *Guidelines for Near-Term Development of Mongolian Geology and Mining Sectors in the attachment to the government's May 2002 Resolution No.103, 16pp, unofficial English translation.*

percent a year. by 2004 and 10 percent a year by 2010.” If implemented well and without delay, these steps will encourage investment and mineral development. They include inter alia:

- Commitment to increase state-budget financing to complete 1:200,000 geological mapping and accelerate 1:50,000 mapping of still under-examined areas of mineral potential.
- Reinforce the already favorable legal environment for private mineral exploration activities.
- Strengthen the geological information database through upgrading to international information technology standards.
- Consolidate the numerous existing laws and regulations directly concerning the proper conduct and impacts of advanced mine development and mine production, processing and rehabilitation into a separate Mining Law.
- Accelerate the drafting of a separate artisanal mining law to accommodate the currently illegal mining of placer and hard rock mineral deposits.
- Create regulations to improve opportunities for conducting geological explorations in specially protected areas and state-border zones.
- Create incentives to support new ore processing plants and production of new mining products.
- Increase investment by establishing a favorable legal environment and tax system.
- Create regional development policies to promote exploration and mining in remote regions.
- Promote wider use of the minerals law stability agreement option.
- Design and introduce regulations concerning all aspects of mine-site rehabilitation and waste management.
- Increase both state and international joint funding of research studies into the feasibility of developing Mongolia’s currently lower profile mineral deposits, such as iron, uranium, rare earths, and precious stones.

5. This non-exhaustive list demonstrates the overall positive contribution these guidelines make to the recently established mineral investment climate that continues to attract international investors and risk capital to Mongolia.

6. There are, however, some ambiguities and potentially adverse implications inherent in this strategy. Firstly, there is a recurring ambiguity caused by the use of the term “exploration” with respect to the activities of government vis-à-vis the private sector. This issue particularly relates to government’s current geological mapping/prospecting program that ties up and sterilizes over 10 million hectares of the more prospective mineral areas in Mongolia for three years or more.¹⁴⁴ The Minerals Law clearly states, “the government may participate in exploration only through business entities in which the state holds interests under the same rights and obligations as any other person under this law.”¹⁴⁵ There is an important distinction between exploration conducted by the private sector and regional geological mapping conducted by government agencies. Exploration is defined in the Minerals Law as “activities carried out for the purpose of determining the commercial feasibility of mining,” and can therefore include geological mapping. The international private sector accepts and indeed encourages governments to conduct what may be better described as “initial regional geological research programs” that document basic

¹⁴⁴ Held and registered as “exploration licenses” in the name of Office of Geology, MRAM.

¹⁴⁵ ML, Article 6.5

geological data and provide analysis of value to public natural resources inventories, but also suggest potential targets for more pragmatic investigations best followed up through private sector exploration programs. Any indication that a new policy of government exploration is being re-introduced that extends such beneficial government research into more detailed exploration through the registration of illegal private-sector-only exploration licenses contradicts the role of government as manager/regulator and sends an unsettling conflict of interest signal to the international mining community. Recently¹⁴⁶ the Minister of Industry and Trade stated that MIT is conducting 1:50,000 scale geological “research” surveys, but has no intention of expanding such surveys to include further “exploration.” This should be laid out and clarified in all future mineral policy pronouncements.

7. Secondly, the guidelines explicitly state the necessity to “initiate amendments to the Minerals Law” to improve the legal environment for dealing with specified issues. This law currently reflects many attractive investment elements, namely, a stable fiscal and legal framework, a degree of certainty and predictability, and a minimum of investment risk. The proposed amendments focus on fine-tuning this framework through increased controls and obligations related to licensee exploration and production activities. In all cases, this review will demonstrate that regulations and not amendments to the law will accomplish the required improvements. This alternative offers a more efficient solution than the potentially disruptive “Parliamentary vetting and approval” amendment process. It creates less uncertainty and avoids any criticism by investors of premature changes to the Minerals Law, which is regarded as among the best in the world.

8. Thirdly, statements that government intends “to establish new mining companies in rural areas,” “new processing plants,” or insist on production “in accordance with the estimated production levels and deadlines” represent an unfortunate phraseology that may be due to poor translation, but could imply a retrogressive return to institutionalized command and control regulation. A more positive interpretation is that government intends to create the conditions through a favorable legal, fiscal, and regulatory framework to encourage private sector operators to rapidly proceed to the mining and processing of minerals at a rate and in a manner that is consistent with market conditions. This process would be recorded in internationally credible feasibility studies and annual reports to government. This, after all, is specified in the Minerals Law, and would be in keeping with the best mining policies practiced by all successful mining jurisdictions. Any suggestion of political or bureaucratic intervention, or the setting of arbitrary mine production targets and time frames, however, would not only resurrect an historically and technically discredited approach to the public management of mineral resources, but would be fatal to Mongolia’s current international popularity and potential investment boom. This unfortunate perception should also be quickly purged from future mineral policy pronouncements.

THE MINERALS LAW AND IMPLEMENTING REGULATIONS

9. The Minerals Law of Mongolia¹⁴⁷ is acknowledged by the international mining community as one of the strongest legal presentations of mineral licensee rights and obligations in the world, and clearly the most investor-friendly and enabling law in Asia. This is due to the clarity of its provisions that include the first seven fundamental principles regarded as essential by both governments and international mining companies worldwide.

10. These principles are firmly established in this law’s provisions dealing with the concepts of “one-stop first-come/first served” license application and granting procedures and subsequent security of tenure for licensees. All Mongolian and foreign citizens may apply for initial exploration

¹⁴⁶ Personal communication on April 3, 2003,

¹⁴⁷ Minerals Law of Mongolia, enacted on 1 July, 1997

licenses. The transparent rules and procedures for application and ultimate granting of exploration licenses is detailed within the law in a clear and transparent manner that avoids the need for clarifying regulations.¹⁴⁸ This process is embedded in the law and thus eliminates any regulatory uncertainty or discretionary interpretation, and is therefore superior to many other competing mineral laws.

11. Similarly, the guarantee of security of mineral title that a license holder gains with the granting of a license is also superior to many other laws due to the total absence of either bureaucratic or ministerial discretionary actions. There are only three grounds on which a license may be revoked:¹⁴⁹

- A licensee loses its eligibility in accordance with the law.
- The licensee fails to pay license fees
- The exploration or mining area is designated, as a special needs land; in such instances a licensee must be fully compensated.

12. Obligations relating to environmental protection of licensees are another critical area where the Minerals Law also goes beyond enabling clauses, and provides detailed regulatory guidance.¹⁵⁰ Similarly, regulatory details on the important issue of assignment and transfer of mineral licenses¹⁵¹ is included and adequately addressed in the Minerals Law.

13. Nothing should be altered in this law to weaken these important principles. The internationally competitive advantage that Mongolia now enjoys can, however, be further enhanced by additional clarifying regulations, improved formal inter-ministerial coordination, and supplementary legislation to more accurately address the proper conduct of artisanal and, small scale as well as large scale mining operations.

14. There are, however, two other essential areas that do require clarifying regulations, the establishment of reporting formats and standards, and procedures for enforcement of penalties for non-compliance with legal obligations, and the establishment of integrated regulatory processes to deal with issues involving other legislation and levels of government.

15. For dealing with the routine submission of operational data, the Minerals Law prescribes regulations that have yet to be developed and implemented and include:

- The rules, procedures and format for the permissions a licensee must receive from a local administrative body prior to the use of licensed areas. (Article 4.2); that prospectors must receive from landowners, land-possessors or land users to enter their land. (Article 9.3), and the contract licensees must negotiate with landowners or land users in accordance with the provisions of the Civil Law. (Articles 12.7; 16.9; 49).
- The form and content of technical requirements for establishing mining license boundaries. (Article 27.1); submissions for approval of governors of an environmental protection plan subsequent to the granting of an exploration license (Article 29.3); annual reports (Article 29.5); and revisions of environmental protection plans prior to granting exploration license extensions (Article 31.1)

¹⁴⁸ *ML, Article 14*

¹⁴⁹ *ML, Article 47*

¹⁵⁰ *ML, Articles 29, 30, 31. Implementation of environmental laws and regulations at existing operations are being assessed separately under the Bank-sponsored "Review of Environmental and Social Policies and Practices for Mongolia."*

¹⁵¹ *ML, Chapter 5*

- The form and content of annual reports to be submitted by mining licensees to Ministry of Environment, the governor and the Geological and Mining Inspection Agency (GMIA) production data and the previous year's report of activities. (Article 39.4.2/3).
- Public information notices raising awareness of potential licensee violations, and the rules and procedures for enforcing penalties, suspensions and terminations, where warranted. (Articles 6.2,26,52).

16. The careful drafting of these regulations, especially those dealing with the submission of information and reports, will enhance sector management and have an instructive effect on licensees with respect to the law's expectations of proper conduct of exploration and mining activities. They will also reinforce the serious intent of its regulatory and implementing agencies to enforce the legal sanctions available for non-compliance.

17. This approach does not undermine the stability of the legal environment or the sanctity of security of mineral tenure. It does, however, strengthen the clear intent of the law that exploration and mining licenses are granted primarily to facilitate the undertaking of mineral investigations leading to production beneficial to both the licensee and the nation. It must be noted that the exclusive rights granted to licensees also include the right to transfer or pledge licenses to or with other parties.¹⁵² This transferability is essential for project financing and is one of the fundamental premises that has driven the success of the world's dominant mining jurisdictions³ such as the United States, Australia, and Canada⁴ from the very beginning of their modern mining histories. It is now a necessary entrepreneurial component in all successful mining legislation.

18. The second area that requires regulations involves inter-governmental compliance with specifically mandated Parliamentary and government policy directives.¹⁵³ These directives should ensure the development of integrated regulations that are compatible with other relevant legislation. This can only be effectively implemented through formal inter-ministerial memoranda of understanding. The numerous references by the Minerals Law to external institutions and legislation clearly demonstrate the need for improved regulatory cooperation and coordination, monitoring and enforcement. These references cover the three priority areas for integrated regulations and coordinated implementation plans referred to earlier and include:

ML Articles:

- | | |
|---------------------------------|--------------------------------|
| ■ Land Law | 4.12, 8.1, 49 |
| ■ Local Administrative Bodies | 6.4, 29.1, 29.5, and 33 |
| ■ Civil Law | 12.7, 16.9, 42.1, 44.5, and 49 |
| ■ Water Rights Legislation | 16.10 |
| ■ Environmental Legislation | 28, 29, 30, 31, and 44.3 |
| ■ Minister of Finance | 20, 47.9, and 63.7 |
| ■ Health and Safety Legislation | 35 |
| ■ Other ¹⁵⁴ | |

¹⁵² ML, Articles 12 and 40

¹⁵³ ML, Article 6

¹⁵⁴ Other references to external legislation include the Subsoil Law (art. 2), Mongol Bank (art.37), International Treaties (art. 51), Arbitration Law (art. 51), Law on Administrative Responsibilities (art.52.1.2), and the Law on State Secrets (art. 60.3)

19. In dealing with the three priority areas for improved inter-ministerial coordination i.e. competitiveness, social/environmental management, and local government/community involvement, the Minerals Law:

- Enhances fiscal stability and international competitiveness by establishing the important provision for entering into Investment Stability Agreements. It, however, assigns the form, content and other necessary financial and accounting regulations to the Ministry of Finance¹⁵⁵. Such regulations and indeed agreements should be drafted jointly with MRAM to ensure compatibility between general financial requirements and the special investment characteristics unique to mining;
- Addresses environmental management issues in considerable detail, but clearly prescribes an integrated regulatory framework involving both the Ministry of Nature and Environment and relevant Local Administrative Bodies. It is therefore essential to design objective mineral sector-specific criteria for environmental impact assessment and environmental protection plan formats as well as specify the inter-agency duties and responsibilities regarding submissions, notifications and “approvals”, within the timeframe defined by the law. Regulations must also be jointly agreed and drafted to clarify the process of establishing and controlling the special bank account required to properly execute the annual environmental protection budget¹⁵⁶
- Does not provide detailed regulatory guidance for the involvement of “local administrative bodies” or the community comprising “landowners, land possessors and land users.” It does, nonetheless, provide numerous enabling provisions that recognize the importance of regulated involvement of these entities and the authority to clarify the necessary relationships between them and the licensee through appropriate regulations. Further, the law’s articles on State Regulation, Special Needs Lands, Environmental Protection and Relations with Local Administrative Bodies¹⁵⁷ do not adequately address the role of local administrative bodies and their critical involvement in mineral license administration, which is necessary to the improve overall sector management. It is apparent that this important component of modern mineral sector management, clearly recognized by the architects of the law, is not appreciated or fully addressed by government/MIT/MRAM or current mineral licensees.

Similarly, the law clearly specifies the need for prospectors and exploration and mining licensees to obtain permission of all land users to enter upon their land, or to make arrangements with them with respect overlapping rights to “common minerals.”¹⁵⁸ Again, this requires clear regulatory terms, conditions, rules and procedures to assist licensees and land users to deal with this potentially contentious process.

21. A fourth priority area included in enabling provisions of the Minerals Law is the function of geology and mining inspection. This basic regulatory function is highlighted in numerous provisions that establish the GMIA.¹⁵⁹ It is apparent that while the law is strongest with regard to mineral license security, and MRAM’s legal procedures and transactions, it is weakest in defining the regulatory duties and responsibilities of GMIA. Two government policy initiatives have evolved since the enactment of this law in 1997 that further undermine this weak lead agency mine inspection unit:

¹⁵⁵ *ML, Articles 20,63*

¹⁵⁶ *ML, Article 30.11*

¹⁵⁷ *ML, Articles 6,8,29-31, 33*

¹⁵⁸ *ML, Articles 9.3, 11.2, 12.7, 16.9,49*

¹⁵⁹ *ML Articles 6.2.4, 11.4, 18.10,27.1,36.1,38.5,52.1,53*

- Since 1997 ministries have independently enacted numerous laws, joint orders, resolutions, and national standards that directly impact the mining sector. These involve the whole spectrum of mine inspection issues including mine site environmental management protection and reclamation; water use, quality and pollution controls; air quality and pollution standards; classification, use, protection and storage of toxic chemicals; worker health and safety; waste management, and mine rescue
- The agency was consolidated into the State Professional Supervision Administration in January 2003, which reports direct to the prime minister's office. Although many of the necessary implementing regulations are already in place, the responsibility for monitoring, inspecting and enforcing the proper and safe conduct of mining operations has been transferred from the direct coordinating mandate of the Minerals Law. MIT's responsibility to "develop and implement (new) state policy" is, however, in no way diminished, and consequently they should facilitate the consolidation of these laws and regulations into an effective mine-specific inspection and enforcement regime.¹⁶⁰ This clearly represents one example of mineral sector management that warrants review and the drafting new legislation as recommended in the government Resolution No. 103 guidelines; namely, to enact a new separate mining law to more efficiently regulate the exploitation stage of the exploration/mining/rehabilitation sequence.

22. While integration with other legislation is essential, it would be unwise for MIT to abdicate its responsibility, implicit in the Minerals law, to either initiate or coordinate the drafting of mineral sector-specific regulations and formal coordination procedures that overlap with the land, civil, environmental and other laws, and leave the regulation of proper conduct of mineral licensees in other less knowledgeable hands.

LAW ON THE IMPLEMENTATION OF THE MINERALS LAW

23. This "small law" was a supplement to the larger Minerals law, both enacted on July 1, 1997. Its transitional purpose was to convert and re-register pre-existing licenses to either new exploration or mining licenses in accordance with the new law. Its only relevance at present is Article 7 of this nine-article law, which says "in the event that the mining license holder carries out mining at a deposit where prior exploration has been funded by the government, he shall reimburse the prior exploration costs in regular parts within 5 years after the effective date of the Minerals Law. Amounts and procedures for reimbursement shall be set forth by the government."

24. The Minister of Industry and Trade has stated¹⁶¹ that 188 deposits fell into this category. In follow-up discussions, Mining Office officials confirmed that these deposits are now covered by new mining licenses, of which 12 or less have met the five-year repayment requirement, which theoretically expired on July 1, 2002. Article 7 prescribes finite amounts and calculation procedures.¹⁶² Agreements have been entered into with many of these "legally liable" licensees stipulating five yearly repayments. These involve approximately 90 (mainly placer) gold deposits, 40 coal deposits and a number of iron and industrial mineral deposits, many of which are unprofitable and not in production. Producing licensees continue to pay the yearly increments (Tg 800 million was reportedly collected in 2002). Only revenue-generating licenses are required to make repayments and consequently many of the agreement repayment time limits have of necessity been extended beyond the law's July 2002 expiry date.

¹⁶⁰ ML, Article 6

¹⁶¹ Personal communication in a meeting on April 3, 2003.

¹⁶² As set out in government Resolutions 20 (1991) and 234 (1997).

25. If this is reasonably correct, then it is likely that these 188 mining licensees (out of a total of approximately 700 currently registered) were aware of this controversial reimbursement arrangement when they chose to re-register or acquire rights in these designated deposits. To resolve this unfortunate transitional stipulation, government and licensees could interpret the payment on these 188 deposits as a “one-off /good will” obligation. This legal terminology would establish that this type of payment will not be extended beyond the specified 188 deposits, and that the holders accept the legal authority of the government to recover some historical costs for these deposits based on the now expired Article 7 of the 1997 Implementation Law.

26. It should be noted that “extra” charges imposed on any, especially marginal, mineral deposit increases the investment cost of these deposits and seriously undermines their chance of being developed. It might, therefore, be in the country’s best interest to waive further payments in exchange for formal commitment by licensees to spend the money on “internationally credible” feasibility studies. Similarly “extra” charges, commonly in the form of government participation through indefinite “carried equity interest,” have an even longer lasting negative impact on the profitability of many deposits involved in “agreements” with private investors. In any event it would be unwise to expand this “deposit list” beyond the 188 already designated. Despite the above attempt at compromise, there is little economic justification for retroactive recovery of arbitrarily valued “state-funded exploration”. Consequently, there are no analogs for such payments in any other internationally successful mineral sector legislation.

27. It is clear, however, that MIT proposes to amend the Minerals Law to require current and future licensees beyond the specified 188 to also enter into agreements specifying repayment schedules for exploration undertaken by government (where designated), as well as “indicating the obligations of the licensees related to bringing the deposit into production”. This retrogressive initiative demonstrates a lack of appreciation of the fundamental international investment principles that are the basis for Mongolia’s recent mineral investment success. It will create unnecessary investment uncertainty which will discourage this incipient orderly development of the mineral sector.

DRAFT LAW ON ARTISANAL MINING OF MINERALS

28. Informal small-scale mining of placer gold and surface coal and fluorspar deposits has been carried out in Mongolia for decades. This activity has become a highly publicized social phenomenon over the past four years. The exponential increase in this type of mining has been caused by the precipitous loss of traditional herding livelihoods by thousands of rural Mongolians due to prolonged bad weather, and the poverty-driven opportunity to manually extract minerals from the periphery of operating coal and fluorspar mines and from the initial waste products from placer gold dredging operations in areas where these formal (and legal) activities have coincidentally increased over this period. It is estimated by MRAM that 30,000 individuals are currently involved, at least seasonally, in illegal extraction and selling of gold alone. This section focuses only on the government efforts to accommodate this new artisanal mining livelihood and draft appropriate legislation to legalize and “socialize” these workers.

29. The Minerals Law enshrines the admirable principle of non-discrimination. Any Mongolian citizen can acquire an exploration license with a simple application form and at minimum cost. One disadvantage for any new artisanal applicant is that applications must be submitted in person at the Office of Geological and Mining Cadastre (OGMC) in Ulaanbaatar. Many of the new artisanal mining areas are far from the capital, and the new miners have had little or no experience or education regarding the benefits of security of mineral title or license holder rights and obligations. Apart from the law’s low barriers to entry and secure mineral title for all participants, rich or poor, it does not specifically address the special circumstances that this unexpected

phenomenon now presents. A conference, organized by the National Mining Association of Mongolia in 2002, involving state mining officials, affected mining companies, local officials, and artisanal miners concluded that this mining activity should be “legalized.” This will require appropriate framework to regulate the proper conduct of such operations, as well as an educational framework to incorporate this new livelihood as an economically and socially acceptable element within the impacted local communities. This admirable goal contrasts with the initial but futile attempts in many other mining jurisdictions to discredit and prevent this type of mining activity. This consensus gave rise to government’s policy decision to draft a special law to define and administer the unique factors involved in managing this ‘new-to-Mongolia’ people’s mining employment sub-sector.

30. Government’s initial effort to deal with this issue came in 2001 when an interim regulation on “Gold Extraction By Non-Industrial Means” was issued jointly by the Ministries of Infrastructure and of Trade and Industry. It made allowance for artisanal mining to continue on licensed areas, subject to the agreement of the mining license holders, but few licensees willingly agreed. Gold produced by the artisanal miners was to be sold to the licensees, but this rarely happened. The regulation gave local government the responsibility of registering individual miners and securing company cooperation, but only limited numbers of miners were actually registered, more in some soums than others.¹⁶³ For the local governments, it posed a major administrative challenge and hardship given their limited resources. Un-permitted miners operated alongside the permitted miners. Implementation was further complicated by the miners’ mobility, their penchant to move between areas, and the seasonal influx of “temporary” miners during the summer months.

31. This interim regulation was not well understood by any of the involved parties and did not solve many of the problems of illegal activity. It did, however, serve as a useful educational tool in the evolution of the current draft of a new law. Although this regulation had a one-year life, it is still set a number of legal precedents that must be addressed in the new draft. The following basic premises guiding the design of this new law and special regulatory framework were articulated by the MRAM and parliamentary architects¹⁶⁴ and include:

- It is desirable to organize the individual ninjas into legal cooperative entities.
- This organization must be formulated and administered from the most local administrative level (the *soum*) as the first legal entity.
- The legislation must balance local Mongolian societal imperatives with relevant international experience and best practices.
- The goal of the legislation is to achieve a reasonable degree of regulatory control. Expectation of 100 percent compliance is both illogical and unattainable.
- The law should address long-term rather than short-term solutions to this issue.
- The law must combine the constitutional rights of ninjas as citizens entitled to jobs and government services with their responsibilities with respect to health, safety and environmental rules and procedures, and their contributions to government revenue.
- An effective final draft of this law can only be attained through continuing input from all stakeholders, but especially from ninja and impacted local community representatives.

32. The following provisions have been extracted from an unofficial English translation of the most recent draft:

¹⁶³ In Zamaar soum about 1600 of 5000+ miners were registered, interim certificates were issued along with a pamphlet describing the responsibilities of the miner and some basic safety rules

¹⁶⁴ A preliminary draft was discussed in a meeting held on April 10, 2003.

- Artisanal mining means mining with manual tools or small capacity equipment.
- Artisanal mining shall be conducted only through a cooperative that shall consist of not less than eight members
- A *soum* or *aimag* governor shall grant certificates and register cooperatives, with MIT/MRAM approving the template of a certificate.
- Artisanal mining may be conducted on licensed areas with the permission of, or an agreement with, the holder of a license obtained in accordance with the Minerals Law.
- Artisanal mining may be conducted on relinquished land in accordance with Articles 45 and 46 of the Minerals Law.
- *Soum* and *aimag* governors shall assign and register unit areas for artisanal mining, and enter into agreements with cooperatives.
- Governors shall have the right to terminate agreements and/or deregister cooperatives on inspector's discretion, non-work, non-payment of tax, violation of a license holder agreement or cooperative decision to cease operation.
- Members of artisanal mining cooperatives shall pay personal income taxes, but shall be exempt from payment of royalty.
- Cooperatives shall set aside mandatory funds for the purpose of land recovery, and ensuring safety and hygiene
- A cooperative member cannot be a member of another cooperative.
- Violation of the law shall incur fines and, where warranted, civil or criminal penalties.

33. These provisions provide a general outline of the direction in which this draft legislation is proceeding. According to its architects, it has been vetted with relevant stakeholders on numerous occasions and is currently being informally circulated among regional members of Parliament. Nonetheless further analysis suggests that this proposed legislation:

- Represents a highly structured, top-down approach, heavily reliant on local administrative capabilities and mining company goodwill for its implementation, and limited to mining undertaken with hand tools or very small motors by Mongolians.
- Changes organizational structure by substituting the family with the cooperative as the legal and operational framework, while locking the "organized" miners into current family based extraction methods and technologies.
- Confines organized artisanal mining to already mined areas or areas relinquished by the commercial companies and returned to the state.
- Provides "organized" miners with a use right as opposed to "title" to a designated unit area for a fixed period of time.
- Does not provide a clear pathway to graduate from artisanal to entrepreneurial mining. The cooperative does not have the status of a legal body under civil law, and may not be eligible to participate in formal mining under the terms of the general Mining Code or have access to commercial credits.
- Imposes high administrative and financial costs for both miners and local authorities.
- Does not define the sources of funding for implementation and monitoring.

- Gives no government commitments to provide training or technical support to the miners or local authorities; and/or companies committed to provide some technical assistance to cooperatives operating within their licenses.
 - Imposes an indiscriminate and total ban on the use of mercury and other hazardous chemicals, which is contrary to current international best practice, and may jeopardize the viability of diversified livelihood strategies of sedentary rural agricultural communities in hard rock mining areas.
 - Effectively bans the use of labor below the age of 18 in the mines, which is rare for emerging nations, where children contribute significantly to household income and sustainability and absent in artisanal mining for which the international target is compliance with ILO Convention 138, limiting work age to 14 years and older.
 - Eliminates mining of a seasonal or casual nature.
 - Does not provide for any dispute resolution or adjudication mechanisms.
 - Raises the barriers to entry of artisanal mining, which will ultimately reduce participation and limit the sub-sector's ability to alleviate poverty and act as an effective safety net.
34. Does not provide a mechanism for: ensuring a sufficient supply of quality land for organized artisanal mining; providing technical expertise to select, demarcate and distribute unit-mining areas; or monitoring third party compliance.

ANNEX 8. CLASSIFICATION OF MINERAL RESERVES AND RESOURCES

Table 3.

UNITED NATIONS INTERNATIONAL FRAMEWORK CLASSIFICATION FOR RESERVES/RESOURCES
Solid Fuels and Mineral Commodities

UN International Framework ↓	National System ↓	Detailed Exploration	General Exploration	Prospecting	Reconnaissance
Feasibility Study and/or Mining Report		1 Proved Mineral Reserve (111)	(1 1 2)	(1 1 3)	
		2 Feasibility Mineral Resource (211)	(2 1 2)	(2 1 3)	
Prefeasibility Study		1 Probable Mineral Reserve (121) + (122)		(1 2 3)	
		2 Prefeasibility Mineral Resource (221) + (222)		(2 2 3)	
Geological Study		Measured Mineral Resource (331)	Indicated Mineral Resource (332)	Inferred Mineral Resource (333)	Reconnaissance Mineral Resource (334)

Economic Viability Categories:

1 = economic

2 = potentially economic

3 = Geological Resource (belongs to the reserve and potentially economically extractable resource)

Code: (123)

Date:

ANNEX 9. COMPARISON OF INTERNATIONAL TAXATION REGIMES

	Mongolia	Australia (Western Australia)	Canada (Ontario)	Chile	China	Indonesia
National Income Tax						
Tax rate	40%	36% (reducing to 34% for 2001, and 30% thereafter)	28%+4% surtax: 29.12% 0.225% of net assets (4% surtax is creditable)	15% plus 35% on distribution. Credit available for 15%.	30%	30%
Minimum tax						
Depreciation						
Mine building	2.5% SL	SL over lesser 10 years or life of mine	100% deduction for assets acquired before start of production.	12.5% SL	5% SL	10% or 20% SL
Mine equipment	20% SL	Rates vary depending on life of asset.	Otherwise 25% DB.	33.3% SL	10% SL	10% to 100% SL or DB
Processing building	2.5% SL	SL or DB may be used.		12.5% SL	5% SL	10% or 20% SL
Processing equipment	20% SL	Non-deductible with limited exceptions		33.3% SL	10% SL	10% to 100% SL or DB
Cost of concession	10% SL		30% DB	Units of production	Amortize SL over life of asset Maximum: 20% SL	10% to 100% SL or DB
Preproduction development	100% or over life of mine	SL over lesser 10 years or life of mine	100%	16.7% SL	Same as cost of concession	10% to 100% SL or DB
Preproduction exploration	100% or over life of mine	100%	100%	16.7% SL		10% to 100% SL or DB
On-going exploration	100% or over life of mine	100%	Off-site: 100% On-site: 30%	100%	100%	100%
Loss carry forward	None	Indefinite	3 year carry back, 7 year carry forward	Indefinite	5 years	8 years
Depletion Allowance						
Other	Full tax exemption for first 5 years of production. Next 5 years subject to half exemption.	Accelerated deduction for certain transport facilities, and immediate deduction for site rehabilitation costs.	Resource allowance of 25% of resource profits, in lieu of deduction of provincial tax		Mine with more than a ten year life may be eligible for a tax holiday	
State Income Tax						
Tax rate	None	None	11% of taxable income	None	3% of taxable income	None
State Mining Tax						
Royalty						
Tax rate	7.5% - placer gold 2.5% - all other minerals	3 systems: - flat rate per tonne - % of revenue - % of profit	10% of taxable profit Exemption for first C\$500,000 of profits	None	0.5% to 4% of gross value depending on metal	<2000kg: US\$225 per kg >2000kg: US\$235 per kg (Gold)
Depreciation			30% SL (100% for assets acquired before production)			
Mining assets			15% SL			
Processing assets			100%			
Preproduction dev			100%			
Exploration expenditure			100%			
Processing allowance			Specified % of cost of processing asset			

	Mexico	Peru	Philippines	PNG	United States (Colorado)	Vietnam
National Income Tax						
Tax rate	35% (5% deferral)	30%	32%	35%	35%	25%
Minimum tax	1.8% of gross assets (income tax can be carried back 3 years and forward 10 years)	0.2% of net assets as at end of 1998 year (Creditable against income tax.)	2% of gross income starting 4 th year after commencement of operations		20% of alternative minimum taxable income (adjusted net income)	
Depreciation						
Mine building	5% SL	3% SL	Various rates	10% SL	7 yr 200% DDB for regular	2-4% SL
Mine equipment	12% SL	20% SL	depending on whether the life of the asset is	var % SL	tax, and 150% DB for minimum tax	12.5-20% SL
Processing building	5% SL	3% SL	greater or less than 10 yrs	10% SL		2-4% SL
Processing equipment	6% SL	25% SL		var % SL		12.5-20% SL
Cost of concession	Over term of concession agreement	Units of production	Same as preproduction exploration and development			
Preproduction development	10% SL	100% or 3 years	100% but annual maximum	20% SL	70% in first year.	Unclear. Possibly included
Preproduction exploration	10% SL	Units of production/100%	is 25% of taxable income	20% SL	Balance on SL basis	in cost of capital assets.
On-going exploration	100%	100% or 3 years	100%	100%	over 5 years	Unclear.
Loss carry forward	10 years	4 years, as from first profitable year	5 years (1 st 10 years of operation) 3 years thereafter	7 years	2 year carry back, 20 year carry forward	5 years
Depletion Allowance					Lesser of 15% gross income or 50% of net income (for gold, silver, copper, iron ore).	
Other	10% profit sharing to employees	8% workers profit share calculated on net income before tax Special approval available for additional 4 year loss carry forward	Tax holiday: 3 to 8 years depending on the status of the project	Excess profits tax on profit in excess of defined level		Income tax rate reductions are possible, depending on location. Exploration and exploitation may need to be conducted in separate entities.
State Income Tax						
Tax rate	None	None	Not to exceed 2% of gross receipts	None	5% of federal net income	None
State Mining Tax						
Royalty						
Tax rate	None	None	Minerals extracted from mineral reservations: minimum 5% of gross value Mineral Agreements or Mining Permits on ancestral lands: minimum 1% of gross value	Royalty: 2% NSR Mining levy: based on statutory formula	Severance tax : Metallic 2.25% of gross income > \$19m Property tax: 4-11% of greater of net proceeds or 25% of gross proceeds	1% to 8% of gross value

ANNEX 10. CASHFLOW MODELS OF TYPICAL MINES

a) Large Copper Mine Cash Flow

[illegible]

b) Non Placer Gold Mine Cash Flow[illegible]

ANNEX 11. GENERAL CHARACTERISTICS OF ARTISANAL MINING

1. The valuable “waste” products left behind by the licensed gold placer mining operations provide the main reserve of mineable material for the informal miners in Mongolia. These castoffs and other mineable materials include:

- lateritic clay balls, which are too large to be handled by the on-board, wash plants of the dredges. These gold rich clay balls have been a prime target of the miners.
- thin alluvial bands of gold bearing material that are removed as part of the overburden and cast to the side by the draglines. These waste dumps are ‘explored’ and mined by the informal miners
- gold bearing materials left behind in the floor and in the pit walls of mined out side valleys
- terrace alluvials into which the miners can drop vertical shafts
- tailings of wash plants processing the terrace alluvials
- frozen gold bearing gravels located near the surface in areas where permafrost is common, which are thawed and removed by the miners.

Only in the case of the terrace alluvials are the artisanal miners in direct competition with the commercial operators. The dredging operations have thus far not been interested in reclaiming cast off materials or residual materials left behind in the mined out areas. Most of these materials lie within licensed and abandoned areas, which have already been mined commercially. There are instances where the small miners have moved onto virgin areas both within and outside of existing licenses, but are quickly removed by the license holder or local authority.

3. In the hard rock areas, the artisanal miners appear to be working mainly small veins, but some of the deposits, which they are exploiting, are located on licensed land as well as on the edge of protected forest areas.

4. Mining and processing methods and equipment. In the placer areas, where some of the ‘material left behind’ has been exposed or visibly strewn over the terrain’s surface, the main method of extraction involves digging and bagging. For exposed material on dragline waste piles, it often only needs to be loosened manually and naturally slides down slope to the wash site. If the material is buried under a layer of overburden, as may be the case in both placer and hard rock areas, shafts or adits may be dug to gain access to the ore.

5. In placer areas, the gold is coarse and separable from the gravels and sands by washing with water, sometime using screens for initial separation, then pans or small sluiceboxes. In the hard rock auriferous quartz areas it must be liberated from the rock. This usually involves some sort of crushing and milling, which may be done by hand or by machine¹⁶⁵. Some preliminary breaking and pre-selection of the quartz may be involved to reduce the amount of rock milled. Gold particles are recovered from the milled quartz by washing and gravity separation. A black sand concentrate is produced and the visible gold particles are removed by hand. The remaining sand is rewashed and mixed up with mercury, which amalgamates with the smaller and finer gold particles. Excess mercury is decanted and collected. It is also recovered from the amalgam by squeezing it in a porous cloth. Finally the amalgam is roasted, which drives off most of the mercury in vapor form, and leaves behind a ‘sponge’-like gold, which still contains some mercury.

6. In all these cases, the toolkit is technologically simple, including shovels, bars, buckets

¹⁶⁵ In some cases, the miners bring their material to mechanized mills, which are owned and operated by independent entrepreneurs. The miners pay a fee for the use of the machinery and take their milled material with them

or sacks, rope, and hammers and chisels, and sometimes explosives. Bed screens, plastic dish pans, rubber door mats, small sluices, small motorized water pumps and hoses are used to separate and wash the material; mortars and pestles for crushing and grinding. Amalgamated gold is roasted in a pan over an open flame, on top of or inside a small stove or oven.

7. **Adaptation and technology change.** There is nothing extraordinary or unique about the methods used to find and extract the pay dirt, and to recover the gold. The methods used in Mongolia are standard and common to gold mining around the world. What stands out here is the willingness of these novice miners to try out and adopt new or modified technologies which are seen to improve their own productivity, or to solve problems that would otherwise limit their ability to produce. Examples include the rapid changeover of panning equipment from wood to metal to plastic, the use of torches or heated stones to warm wash water, the miniaturization of larger Russian or other pieces of equipment to make them portable and affordable (drums and water jets, vibrating screen classifier)

8. **Environmental management practices.** Unfortunately, there are few examples of informal miners who practice environmental controls, when left to their own devices. No cases of self initiated environmental work have been observed in Mongolia. Neither the experience nor the economic means currently exist within the artisanal mining population neither to plan nor to implement basic environmental controls during mining. Damages generated by artisanal surface and near surface mining therefore go unmitigated. Similarly, after mining has ceased, there is little likelihood of the informal miners rehabilitating the site.

9. In the hard rock areas where the mining is underground, the surface imprint is smaller. Waste rock removed during the development of the mine is dumped or piled without any thought to future site restoration. The potential for environmental problems is higher at the sites where the ore is crushed or milled, where the concentrate is amalgamated using mercury, and where the amalgam is roasted to drive off the mercury and recover the gold (see 5, below), but as far as is known, no environmental controls are exercised at these sites.

10. **Work activity cycles.** Mining in Mongolia is largely a seasonal activity. Commercial gold miners typically limit their operations to a 155-day work season, which extends from April to December. Artisanal gold mining follows a similar pattern in the placer mining areas. Most activity is concentrated between later April/May to October, although it has become a year round activity for small numbers in both placer and hard rock mining areas. In placer areas, activity levels are characterized by striking peaks and reached in July and August, coinciding with school and annual leave months. In hard rock zones, gold mining slows down during the winter months but does not cease.

11. The seasonal feature of artisanal placer gold mining is as much a function of its economic role as of the climate. For most of the people involved, mining is a source of supplemental income that can mean the difference between poverty and sustenance.

12. Migrants to the mines come from other rural areas, but more typically from the country's urban areas, namely Ulaanbaatar and the provincial aimag centers. The seasonal influx is comprised of off-season artisanal coal miners¹⁶⁶ and formal sector workers on vacation there to augment income, school aged children and mothers joining family member to assist in the mining during the school break, graduates and university students trying to earn enough to cover technical school or university tuition fees and living expenses for the coming academic year.

13. **Mobility.** There can be sudden shifts from place to place within a placer mining area reflecting perceived changes in ore grade or in the productivity of particular areas. Such shifts

¹⁶⁶ Recently 300-400 informal coal miners have been making the trip to the placer gold mining areas during the six month interval (April to September), when demand for coal is negligible and the weather for mining and washing gold is best.

tend to be of a voluntary nature, but may be influenced by the presence or absence of sufficient surface water for panning operations. This is not the case in the artisanal hard rock mines, where the mine 'owners' reside locally and have expended family resources and time on underground development. Accordingly, they are reluctant to change locations until the mine's reserve has been largely extracted.

14. In some cases, shifts from one site to another are involuntary, imposed on the miners by the private security forces of the licensed miner or by the public police of the local bag or soum administrator(s). Evictions have become more and more common, and occur in both placer and hard rock areas, where the miners are working on licensed land.

15. **Organization of work and labor.** In Mongolia, solitary miners are rare. Miners work as small groups or extended family units, from 2-30 people strong. Such work groupings seem to be self-financing and self-managing. Most of the operations associated with mining demand a certain level of collaboration, whether for developing the physical access to the mineralized zone (shafts, adits, pits), for hoisting and hauling the ore, for transporting it to a wash site and then for washing it. Each group operation functions almost like a vertically integrated microenterprises, from primary production through processing and sales.

16. In the hard rock areas, gold mining is in many cases a collective labor of household members or in some cases, several households working together.¹⁶⁷ The exception to the rule is the digging up and washing of oversize material cast out by the wash plants on the placer dredges, which can be carried off and panned by an individual.

17. Cooperation between groups for production is generally weak. Although large numbers of miners may be operating in close proximity they operate in parallel, with many small groups undertaking the same but independent operations. Where inter-group operations occur, they are typically to overcome particular problems, which affect or benefit the groups as a whole, e.g. digging mining holes with the aid of a tractor-mounted mechanised drill as at Sharin Gol, or digging a deep well for the supply of water for panning, solutions are provided by individuals who then charge the groups for the service.

18. **Workforce characteristics.** Mine work is typically organized around immediate or extended family units. Where mining occurs on a year round basis, the constitution of the work unit is often adjusted to allow children of school age to remain in school. However, in certain situations, children accompany their parents to the gold fields, and those of school age often end up assisting at the mine site. In both placer and hard rock areas, men predominate in the heavy work of digging and hoisting. Women and children are usually engaged on the surface, hand breaking and sorting rock, transporting material to the washing or processing site, panning, and more controversially in the amalgamation process. However these roles are by no means exclusive and men, women and children can be found undertaking all operations. This involvement of all family members in the work of the mine is typical of artisanal mining in other countries as well.

19. **Support services.** The market has been quick to supply services where a broad demand exists. In some of the larger mining settlements, there are more services offered and merchandise being traded than in many soum and even aimag centers.¹⁶⁸ The commercial impacts extend to Ulaanbaatar from where all types of products are procured, including the scrap tires burned to heat washing water during the winter months. Mobile traders gather around the larger mining sites where such items as cooked food, clothes and equipment are offered for sale.

¹⁶⁷ PTRC, 2002, p 5

¹⁶⁸ Such is the case at Uyanga in Overhangai Aimag, which has possibly the best soum market in Mongolia with its well-stocked shops offering a wide range of items.

Annex Table XI.1 Economic Activities Associated with Informal Gold Mining

Activity	Scale Compared with Non-mining	Comments
Inputs to Mining Operations:		
<i>Personal Goods and Services on Site</i>		
• Groceries	Higher prices and better quality.	From Ulaanbaatar or directly from China.
• Clothes	Increased consumption.	From Ulaanbaatar or directly from China; both new and secondhand.
• Fresh meat and dairy products	Increased consumption.	Local economic benefits, although some miners bring their own livestock.
• Alcohol	Large incremental consumption.	Predominantly low quality sold at high prices.
• Other entertainment – computer games – billiards – prostitution		Includes child prostitution (ILO).
• Ready cooked food	Incremental activity adding value.	
• Luxury goods: perfume and cosmetics	Increased consumption.	
• Transport	Increased consumption.	
• Sleeping space in gers	Incremental activity.	
• Fuel – firewood – dung		Local economic benefits but environmental problems.
<i>Mining Activities</i>		
• Equipment – pans, blow torches, rubber mats, pumps, rope, shovels, picks, crow bars, sacks, discarded vehicle tyres, dung	Incremental sales.	Mainly imports from China.
– waterproof leggings, gloves		Tyres reputedly bulked up in UB.
– Mercury	Incremental.	Mined and imported.
– benzine	Significant increased consumption.	
• Specialised mining services – placer hauling – hole drilling – sluice processing		
Outputs from Mining Operations		
• Gold buying – local – bulking up	Incremental, adding value.	
• Smuggling	Incremental, adding value.	
• Jewelry industry	Increased profits.	
• Diverse investment of profits – vehicles / taxis and spare parts and servicing – education – property – business ventures	Incremental, adding value.	In <i>soum</i> , <i>aimag</i> centers and Ulaanbaatar. This mirrors the formal Mongolian mining conglomerates, which have diversified widely with their gold profits.

20. The presence of a monied population in the mining areas has also created opportunities to develop other local industrial activities. For example, a small-scale open pit lignite mining operation has opened at the mouth of the Tuul Valley. This mine supplies lignite to the informal miners for domestic heating and may eventually be able to expand its sales to the steam heating units of the commercial mining camps.

21. Annex Table XI.1 above lists some of the principal economic activities associated with informal gold mining and its positive economic impacts compared to the situation that existed

before the initiation of informal activity.

22. Gold market. According to the current laws, gold can be purchased and exported by authorized banks and licensed miners. However, the Bank of Mongolia is the principal buyer of gold in the country, and has been the sole official exporter to date.¹⁶⁹ While licensed miners have the right to buy gold that is produced by others working on their leaseholds, there is little evidence that any companies are doing so. Nor does the Bank maintain buying facilities in the mining areas. Most artisanal production is sold informally, either to resident local entrepreneurs or to itinerant buyers who visit the goldfields. Gold is also bartered locally to purchase food and clothing and possibly other services, when cash is not available..

23. In the Boroo district villages involved in mining quartz veins, mercury selling and gold buying shops are located in the villages. In the placer areas, buyers are often itinerants, like the miners. The price paid for placer gold in the field is typically 80% of the world price,¹⁷⁰ which is not unreasonable. The price in Ulaan Batar is not significantly higher, 2-3% more. The price paid for vein gold is presumably less.¹⁷¹

24. The gold is not resold to the central bank, but appears to be resold to buyers/traders from the capital who move it out of the country to Korea and China. As well, when the trading posts along Mongolia's long border with China are opened, the gold price in Bayanhongor aimag, one of the closer producing areas to China, increases by 20 percent. The Bank of China pays a 5 percent premium over the world price. The end result is that while the miners receive what by all accounts is a reasonable price for their product, the government loses. It is unable to collect royalties or benefit from the foreign exchange that its purchase in tugriks and resale in dollars would bring. It cannot record production and sales revenues in the national accounts or the GDP or include its sale in the trade balance.

25. Because informal sales of gold are not registered, it is impossible to know how much gold is actually produced by artisanal miners. The government estimate for 2002 is around 500 kg of gold. This is probably low given what miners say they are able to produce on a daily basis. Other estimates of production range from 2.5 to 9 tons for the year. These estimates are not definitive by any means. A quick calculation based on anecdotal information and some conservative assumptions, suggests that the number might be closer to 2 tons,¹⁷² but certainly more than 500 kg of gold for 2002.

26. Community life and social welfare. Apart from those areas where the mining is community-based, e.g., the Boroo district, settlement and community life is of a transient nature. The miners' settlement patterns have different configurations in different locations ranging from highly concentrated, such as at "Persian Gulf" in Zaamar Soum, Tov province, to dispersed, as at Uyanga in Overhangai province Persian Gulf, which started in 1999, has become a semi-permanent encampment, with year round residents. During the summer months, new settlements can spring up overnight; they are temporary and mobile; with traditional ger dwellings. In Zamaar soum during the summer, such ad hoc settlements are scattered throughout the area, appearing and disappearing, expanding and contracting in size, responding to changes in local mining

¹⁶⁹ Murray and Grayson, 2003, p 43

¹⁷⁰ The price paid typically would take into account the purity of the gold, the kinds of impurities, the price being offered by official buyers, the quality of local governance, among other factors. At the time of my visit to Zamaar, a gram of placer gold would fetch 8700 MTG.

¹⁷¹ Due to the fact that the product of the amalgamation process is 'sponge' gold and is still contaminated with some mercury, but this could not be confirmed during the visit.

¹⁷² Murray and Grayson's field observations suggest that informal gold miners earn on average per day \$ 7.50 US, or at the time, around 0.88 g of gold; if one-third of the estimated 30,000 people are working year round (6 dpw X 50 wpy or 300 dpy) and the remaining 20,000, 9-13 weeks per year, then 6 X 11= 66 days.

This would imply $[10,000 \times 0.88 \text{ g} \times 300 \text{ d} + 20,000 \times 0.88 \times 66] = 4.32 \text{ m person-days} \times 0.88 \text{ g/d} = 3.80 \text{ m grams per year}$ or 3.8 metric tons per year. Using the more conservative assumption of \$ 4 US per day or around 0.47 g/d would imply an annual production of 2.0 metric tons.

conditions and levels of political and physical harassment.. Persian Gulf also will double or triple its size during the summer months. There is no formal or informal planning; these villages, including Persian Gulf, are effectively squatter settlements with no legal rights, and no public services.- no sanitary facilities, no potable water supply

27. There is no effective public administration in the mining areas and no facilities to address the specific health and educational needs of either the permanent or seasonal mining populations. "Immigrant" miners are not locally registered and therefore are not entitled to social services, which are situated in the administrative centers. Provisions for police service to the informal settlements are non-existent. Law and order has become an issue, as criminal elements have also come to operate in the area.

28. In spite of the lack of services, the miners put up with it, as they have no options elsewhere. Many make barely enough to live on, but incomes actually vary considerably, depending on skill, energy and luck.¹⁷³

29. Political organization. There do not appear to be any representative organizations of informal miners in the country at the local, regional, or national levels. This complicates the possibility of dialogue, organization, and cooperation with the miners on a collective basis, and means that local government authorities and mining companies must deal with the miners on an individual or at best on a family basis.

¹⁷³ Estimates, based on field discussions conducted by Murray and Grayson, are that about 25% earn less than MNT 6,000² per person per day, 60% between MNT 6,000 and 10,000 and 15% MNT 10,000-15,000; with a mean of some MNT 8,400 (\$7.50) per day. More recent field discussions³ suggest that while the variability is great, the average may be somewhat lower than Murray and Grayson have estimated, more like \$ 3-5 per day, which even then would be equal to or better than a senior level civil servant earns.

ANNEX 12. PROPOSED LAW ON ARTISANAL MINING

1. Under the proposed law, artisanal mining would be defined as mining with hand tools or small equipment (motors < 6000 cc engine capacity). Its practice would be limited to Mongolian citizens, working as part of registered and approved cooperatives.¹⁷⁴ A cooperative would need to have at least eight members to be certified. However, certification would not convey legal status,¹⁷⁵ only the right to engage in artisanal mining. Each certified cooperative would be granted a 'unit' mining area of no more than 0.50 hectares for three years. Unit areas would be located either within active license areas, or on lands, which has been returned to the state. Mining outside of approved areas would be considered illegal. In the case of licensed land, the location and size of a unit area, along with the terms under which it may be worked by the cooperative, will be established through negotiation between the governor and the license holder. In the case of relinquished lands, the governor will determine the locations and sizes of all unit areas, although a cooperative would have the right to comment on the selection.. A contract would then be signed by all parties, stipulating the responsibilities and obligations of each.
2. A cooperative would be allowed to work only one unit area at a given time. Upon termination of mining activity, the cooperative would have to rehabilitate the site prior to returning it to the state. Approval for a new unit area would be based on the cooperative's compliance with the terms of its first contract, including acceptable site remediation.
3. The proposed law is quite specific regarding the responsibilities and obligations of all parties:
4. **Members.** Although exempted from the payment of royalties, all members of a cooperative would need to register with the Tax Office and pay income taxes in accordance with the Law on Personal Income Taxes of Small Entrepreneurs Whose Income Cannot Be Determined.
5. **The Elected Cooperative Leader.** The leader would be responsible for organizing work schedules, for setting up and managing the cooperative's special fund, for negotiating and signing agreements, for collecting and submitting individual member income taxes, for the sale of minerals mined by the group, and for managing the day to day affairs of the cooperative.
6. **Bank of Mongolia.** The central bank would be the only official buyer of gold, other precious metals and stones and would be obliged to establish buying offices in the mining areas.
7. **Soum and District Governors.** Governors would be responsible to negotiate areas, set terms of use, register coops, assign areas to them, keep records and maps of all assigned areas. The governors would designate sites for washing or processing of materials. They would have the power to terminate or de-register coops, provide assistance to the coops for the marketing of mineral products other than precious minerals.
8. **Mining Companies.** Although license holders would not be obligated to provide areas for artisanal mining, should a company enter into an agreement with the governor and a mining cooperative, it would then be obligated to turn over the designated area, not create any obstacles to the conduct of artisanal mining operations, provide professional assistance to the cooperative, when necessary, and render assistance in the case of accidents. The license holder would be released from its responsibilities to rehabilitate the area, only for the duration of the agreement.
9. The proposal is also quite explicit in defining the conditions of compliance for the cooperative, which would have to:

¹⁷⁴ The draft law lays out a whole process and procedure for getting organized and registered as a legitimate work group, including writing a charter, electing a leader, setting up a special cash fund, applying for registration, submitting the charter, medical attestations of good health for each member and notarized copies of their civil ID cards. The government would assist by providing a model charter and application.

¹⁷⁵ A cooperative as per Article 481 of the Civil Code is regarded as a partnership with no rights as a legal body.

- a) start operating in the unit area within 3 months of the signing of the agreement and not cease activities for more than 3 continuous months¹⁷⁶
 - b) comply with government approved safety rules for artisanal mining
 - c) deposit not less than 10% of the coop's monthly income into the coop's cash fund to cover expenses for health and safety, for land reclamation, and for any other activities that the membership may determine
 - d) ensure that members' taxes are collected and submitted without a lapse of more than 3 continuous months
 - e) avoid:
 - i. employing pregnant women, women within one year of birthing, citizens under 18 years of age, and disabled people
 - ii. using chemicals hazardous to health
 - iii. using motorized equipment with engines > 6000cc capacity,
 - iv. digging vertical shafts deeper than 3 meters without shoring the walls
 - v. doing anything prohibited by the artisanal mine safety rules
 - vi. washing or refining mineral bearing sands or ores in rivers, streams, springs, and lakes, and
 - f) sell its mineral production legally, i.e. to the Bank of Mongolia.
10. Failure to remain in compliance would provide grounds for canceling the work contract or even deregistering the cooperative. A license holder would also be able to petition the governor to terminate a contract, should the cooperative fail to comply with any of its specific conditions.
11. The government would also have the power to levy administrative penalties and fines against'
- individuals who are mining, but are not registered coop members
 - a de-registered cooperative found mining
 - cooperatives willfully disregarding prohibitions in the law
 - cooperatives found guilty of selling its production to buyers other than the BoM
 - people found to be illegally purchasing precious minerals
 - license holders not fulfilling their obligations

OBSERVATIONS AND COMMENTS ON THE PROPOSED LAW

1. The proposed law sets the basic terms of reference for the legal practice of artisanal mining. It limits the definition of artisanal mining to mining undertaken with hand tools or very small motors by Mongolians.

¹⁷⁶ No 155 day work season for the cooperatives.

2. *Highly structured, top down approach.* It takes a highly structured, top down approach to the reorganization and control of artisanal mining, relying heavily on the administrative capabilities of local authorities and the goodwill of commercial mining companies for its implementation.
3. *Changes organizational structure, but locks miners into extraction methods and technologies of current system.* It seems to have as its objective “the professionalization” of what has hitherto fore been largely a survival activity, but only in an organizational sense, replacing the informal family with a formal “cooperative” basis for organization. It does not promote improvements to mining practice; instead it restricts “organized” artisanal mining to the same toolkit currently in use, i.e. hand tools and limited levels of mechanization.
4. *Confines “organized” artisanal mining to already mined areas or areas returned by companies to the state.* In other words, mining plots, i.e. “unit areas” would be demarcated from disturbed or mined out lands on active licenses or from lands that are relinquished by companies by reason of their having mined out the area or found it lacking a commercially mineable ore deposit.
5. *Provides “organized” miners with a use right as opposed to “title” to a designated unit area for a fixed period of time.* The proposed law does not provide the miners’ with security of title, rather a discretionary use right. This makes sense when the unit mining area is located on licensed land, but the rationale does not hold for lands returned to the state.
6. *No clear way to graduate from artisanal to entrepreneurial mining.* It does not seem to provide a pathway for artisanal mining cooperatives to grow into or graduate to formal small mining enterprises. The cooperative, which is the only form of organization permitted under this law, does not have the status of a legal body under civil law, and will presumably be unable in its own right to apply for exploration or mining licenses under the general Mining Code.
7. *High administrative and financial costs for miners and local authorities.* The administrative and financial costs of organization to both the miners and the local authorities will be high. The miners are expected to organize into formal work groups, each drafting and approving their own charter, electing a leadership, setting up financial accounts, submitting an application to register the cooperative, including copies of the charter, medical certificates and notarized identification cards for each member, in order to qualify for the grant of a unit mining area; then entering into a legal contract with the local authority (and mining company) which defines terms of reference for the exploitation of a mining area in order to be able to initiate mining activities; then ensuring that members register with the income tax authorities, that individual taxes are collected and submitted, among other things, in order to maintain the cooperative’s certification; and finally that income is set aside to cover environmental remediation costs and that remediation works are undertaken as in order to qualify for the grant of a new area.. The onus of registering the miners, negotiating areas with the companies, demarcating and assigning unit areas, writing contracts with the miners and companies, monitoring of mining activities and tracking compliance of each cooperative, will fall on the local authorities.
8. *Sources of funding for implementation and monitoring not defined.* The source of funds and other resources to cover costs and support requirements for initial implementation are not defined. Nor is it clear as to how the operating costs of the ongoing oversight and monitoring system will be paid.
9. *No commitments to provide training or technical support.* The proposed law is administratively complex and compliance will be difficult to ensure without an organized program of technical support and training to both the miners and local authorities. It does commit the mining companies to provide some technical assistance to cooperatives working on unit areas within their licenses. Training and technical support will probably be needed in administrative, organizational, and various technical and business skills.

10. *Indiscriminate ban on the use of mercury and other hazardous chemicals.* The rationale may be related to environmental and health and safety concerns and a desire to contain or prevent potential problems before they occur. Prohibiting the use of mercury by artisanal gold miners will have two possible effects. The miners will continue to procure and use it “illegally”, or they will give it up and gold recoveries from hard rock material will drop.¹⁷⁷ This drop in recovery could have its own negative impact on those rural agricultural communities whose economic sustainability now depends on hard rock gold mining. Current international best practice is not to ban the use of mercury, rather to implement education and pilot projects to introduce and integrate responsible handling and storage, amalgamation, roasting and mercury recovery and cleaning practices.

11. *Effectively bans use of labor below the age of 18 in the mines.* This is standard practice in industrialized countries, but is rare in emerging nations, where children and adolescents often make their own productive contributions to household income and sustainability. In many countries where artisanal mining is practiced, child labor remains a problematic issue, defying easy resolution. The Latin American pilot program of the International Labor Organization to eliminate child labor from artisanal mining has made headway in Bolivia, Ecuador and Peru, but even in Peru where a new artisanal mining law was recently approved, its aim with respect to child labor is to gradually achieve compliance with ILO Convention 138, which limits the work age to 14 years and above.

12. *Eliminates mining of seasonal nature.* As currently drafted, the law would completely disenfranchise seasonal, week-end and short time miners, as it requires the cooperatives to work continuously around the year, with a maximum break in activity of no more than three months.

NO DISPUTE RESOLUTION OR ADJUDICATION MECHANISMS SPECIFIED

13. *Raises artisanal mining’s barriers to entry.* One of the reasons why artisanal mining can easily become a “mass” activity, as it has in Mongolia, is because its low barriers to entry make it easily accessible. Raising the “costs” and imposing new administrative hurdles will undoubtedly reduce the number of new entrants and also force some of the existing miners out of the business. This will also reduce artisanal mining’s ability to contribute to poverty alleviation and to act as a safety net.

14. The proposed law does not deal with a number of critical issues related to current capacity to implement and comply. Presumably some of these issues could be dealt with in ancillary legislation or regulations, but must be addressed in order for the law to have any hope of being successfully implemented.

- How will a sufficient supply of quality land to meet the miners’ demands be guaranteed, given that (a) the availability of land is a function of company generosity and the rate at which land is relinquished to the state, neither of which the law compels, and (b) the quality of land will be a function of the amount of economically recoverable mineralized material remaining, which the government can not control?
- One of the responsibilities of the local authorities is to demarcate unit mining areas. Is the technical expertise available at the local level to do so? What grade, quantity, geological, mining and metallurgical criteria will be used to identify and select viable unit areas? What criteria will be used for distributing unit areas to the mining cooperatives – first come, first served, etc.?

¹⁷⁷ This “loss” can be quantified, but will require metallurgical test work.

- Which government departments will provide technical support to the cooperatives and local authorities? How will their new responsibilities be funded?
- How will disputes be received, handled and adjudicated?
- Who will monitor third party compliance, i.e. of the Bank of Mongolia and of the mining companies?

16. It is not at all clear that the proposed law will achieve its intended purpose to regulate and control artisanal mining. The implementation of the proposed law will come with its own challenges. It will complicate, rather than simplify the formalization of the artisanal miners. It will force the development of a different kind of artisanal mining sector,¹⁷⁸ and may be able to move artisanal mining to a more disciplined and organized form of production. With its higher “barriers to entry” and higher costs of participation, it will probably discourage new participation and raise the bar for continuing participation. It may also end up debilitating artisanal mining as a livelihood option for household economic survival.

16. For those families for whom artisanal mining is crucial to their economic survival, abandoning the mines may not be an option, but exchanging family integrity for a mining certificate may also be too much to sacrifice. In the end their response will be informed by the health of the national economy and the alternative opportunities it can provide, but the national economy is not expected to recover soon. This may mean that many of the current families mining may end up going underground in order to maintain their livelihood. “Going underground” would increase their political and economic marginalization,¹⁷⁹ until such time as they are permanently evicted or the ore reserve runs dry.

¹⁷⁸ The proposed legislation seems to have as its goal the “professionalization” of what has been thus far a survival activity. This may work well for that small percentage that have decided to become miners by choice, but they will have a limited future too, unless the government is also willing to open virgin areas prospective for small-scale mining to them for future development

¹⁷⁹ Experience elsewhere suggests that artisanal gold mining may provide incomes considerably higher than the urban average, or in the case of a lack of alternative employment, the opportunity to secure individual or household survival. In the latter case, it doesn’t matter that the market is volatile and prices may decline, or that government may try to impose new regulations. On the edge of destitution, with few or no alternatives, you do what you must do to survive.

ANNEX 13. PRIVATE SECTOR MINING INVESTMENT CLIMATE SURVEY

Number of respondents: 15					
Score (1=excellent, 2=good, 3=ok, 4=bad, 5=very bad, unless otherwise stated)					
	1	2	3	4	5
1. General					
In general, how would you rank Mongolia's mineral potential?	36%	50%	7%	7%	0%
How would you rank the current investment climate for mining in Mongolia?	7%	29%	64%	0%	0%
How investor friendly is the Mongolian Government towards mining?	7%	36%	57%	0%	0%
How would you rank the stability of Mongolia's legal and regulatory system?	0%	43%	14%	36%	7%
How would you rank to overall cost of doing business in Mongolia (1=very low, 5=very high)	7%	14%	64%	14%	0%
2. Legal Framework					
Overall, how would you regard the legal/regulatory framework for investment in Mongolia?	7%	33%	33%	27%	0%
Specifically, how would you rank the Minerals Law?	20%	47%	27%	7%	0%
Is there respect for Security of Tenure?	Yes <u>92%</u>			No <u>8%</u>	
Are the terms and conditions competitive internationally?	Yes <u>80%</u>			No <u>20%</u>	
Are you aware of the recent proposed amendments to the Minerals Law?	Yes <u>80%</u>			No <u>20%</u>	
If yes, how would you rank the proposed amendments?	0%	0%	10%	30%	60%
Are you aware of the Governments Minerals Policy (May 2002)?	Yes <u>50%</u>			No <u>50%</u>	

If yes, how would you rank the Minerals Policy in terms of promoting mining investment?	0%	13%	75%	13%	0%
3. Regulatory Framework					
Overall, how satisfied are you with the Mineral Resources Administration (MRA)?	25%	25%	25%	25%	0%
How does the MRA compare with similar organisation in the Asia Region?	38%	25%	38%	0%	0%
How would you rank the license application system?	45%	27%	18%	9%	0%
Are the requirements for reporting exploration/mining work reasonable?	Yes <u>78%</u> No <u>12%</u>				
Is there an issue of confidentiality when reporting to the Government?	Yes <u>67%</u> No <u>33%</u>				
Overall, how effective is the Cadaster Office?	10%	30%	60%	0%	0%
How effective is the government in collecting and disseminating geological information?	9%	27%	18%	27%	18%
How effective are the government at promoting Mongolia's mining potential?	0%	18%	36%	36%	9%
3. Fiscal Framework					
Overall, how satisfied are you with the Fiscal Environment for Mining in Mongolia?	0%	29%	50%	21%	0%
How do taxation levels in Mongolia compare with other countries in the Asian Region?	17%	0%	42%	42%	0%
How important are stability agreements? (1 = very important, 5 = irrelevant)	64%	9%	18%	0%	9%
Are tax audit requirements excessive?	Yes <u>85%</u> No <u>15%</u>				
Do government officials understand international best practice?	Yes <u>0%</u> No <u>100%</u>				

A) INVESTOR'S COMMENTS:**GENERAL**

'Mining seems to be the most favored sector and is a bit easier to operate in as a foreign investor than in some other sectors.'

'Investment environment is generally OK, but the stability is shaky and could move in either a positive or negative way fairly quickly.'

'Infrastructure in Mongolia is very poor.'

'Mongolia has a bright future in the mineral sector, providing it maintains stability in both the mining and foreign investment legislation.'

'Parliament members should have legal and economic knowledge and a better understanding of the mining industry'

'Mongolia has a poorly developed infrastructure, interest rates of commercial loans are high, relatively high burden of taxation system, and therefore, the cost of production is high.'

'Foreign investors in Mongolia face the difficulties caused by frequent changes of the legal regulations and rules.'

'Mongolia is a land-locked country with a large FDI country immediately south and a large diplomatically and politically important neighbour to the north'

'There is a good exploration support infrastructure set up to aid mining companies in Mongolia with a large pool of well trained technical personnel.'

LEGAL

'The written legal framework is OK to good at present. The main problems arise at the implementation stage – i.e., when an investor must deal with the Government clerks, tax inspectors and judges'

'The continued desire to change the mining legislation is detrimental to foreign investment. While not all proposed changes are for the worse, there needs to be consultation with industry stakeholders prior to the introduction of amendments.'

'Implementation of laws is sometimes haphazard'

'Government seems to be prepared to change legislation at the drop of a hat to suit their immediate needs.'

'The biggest concern is the introduction of large reserve areas (exploration licenses held by the Office of Geology) - these are totally negative from a foreign investment point of view and casts serious doubts on transparency (re. Government intentions).'

'The Mineral's Law is very adequate for investment in the mining sector. There is no need to change it.'

'There is need to make the legal and business environment more favorable.'

'Some articles of the Minerals law should be changed and amended.'

REGULATORY FRAMEWORK

‘The MRA is probably the best run agency in Mongolia.’

‘The Mineral Resource Authority understands best world practices.’

‘In general, the MRAM has done a great job. The Chairman is highly respected and much appreciated’

‘The Cadastre Office leaks information and individuals acquire licenses for profiteering.’

‘The Cadastre Office’s services should be improved, to make information more open and easier to access.’

‘Working with the Cadastre’s office is occasionally difficult. It is open only two days a week to check license/ open ground availability and the small room is crowded. New land/property position maps come out only quarterly and on paper. The Cadastre’s office should move to an internet based system and sell digital versions of the land maps.’

‘Data gathering and open-file aspects need to be addressed. Companies should be made provide relinquishment reports which could be placed on open file.’

‘The Government should ensure that the Mineral’s Law is fully and properly implemented.’

‘There is a need to substantially improve on mining/geological information collection and dissemination by the Government’

‘With the exception of the efforts of a select few officials, Mongolia’s promotion activities are limited at best with too little understanding of the interests/motivations/concerns of foreign investors.’

FINANCIAL FRAMEWORK

‘Corporation tax of 40% is too high’

‘Stop imposing too high a tax burden on the mining industries just in order to improve Central Budget revenue collection.’

‘There is need to change and amend the Taxation Laws in order to make them more clear, understandable, equal and fair.’

‘Make the tax regime more competitive in terms of tax rates.’

‘Stability agreements are a good feature but unfortunately certain operations are too small to be eligible.’

B) SUGGESTIONS ON HOW THE GOVERNMENT CAN IMPROVE THE INVESTMENT ENVIRONMENT OF THE MINING SECTOR OF MONGOLIA

LEGISLATION:

‘Do not change the Minerals Law, do not add additional laws that will adversely affect the current law.’

‘The government needs consistent treatment for stability agreements and the same treatment for all investment in the priority sectors.’

'Fully integrate the Minerals Law with other land use laws.'

'The government must be able to guarantee that foreign investors and Mongolian entities will be treated as equals in Mongolian court-decided disputes.'

'Stability in the mining legislation with stakeholder consultation if changes are to be made'

'Fair implementation of environmental legislation.'

'Office of Geology should not hold exploration licenses'

'Need more education of Government clerks and Judges to assist them to understand the laws that are presently in effect.'

REGULATION:

'Eliminate vestiges of the old Soviet-fashioned bureaucracy. Streamline the license application process, leaving all decisions to the federal government – otherwise there is rampant petty corruption and delays at the aimag and Soum levels. There are no local Soums or aimags that have the manpower or technical expertise to make objective decisions regarding complex mining and environmental issues.'

'The government should embark upon modern geological mapping and geochemical/geophysical programs and make this information available to the private sector so that additional mineral resources can be discovered. They should avoid the compilation efforts that are continuously undergoing a new iteration – these efforts are pointless because they are based on poor to completely incorrect 'data'. What is needed is state-of-the-art new data, not more new publications/compilations of the same poor data.'

'The Mongolian government must control the illegal mining problems. Illegal mining is taking place throughout the country on State and Federal parks, unlicensed areas, and licenses belonging to others. Most illegal mining operations are completely lacking in health, safety or environmental protection programs. The present government approach of asking the license holders to take care of the problem is a recipe for disaster – shall license holders assume a police role?'

'The government should avoid its present course of applying for and holding mineral licenses for the purpose of tendering those lands – they need to fully privatise the sector. The government should provide quality data and services needed by the sector, not try to sell properties.'

'The government should promote the country at the major investment conferences worldwide, also improve the delays in the paperwork involved in establishing a J/V company.'

'Implement stricter reporting requirements for companies'

'Need to develop the mindset of Government clerks so that they understand that they should be serving the public, at present many to most Government clerks are arrogant, demanding and typically refuse to explain their actions or discuss questions with citizens.'

FISCAL:

'Reduce Corporation Tax to internationally competitive rates.'

'Better and more even-handed implementation of the tax laws, including honouring existing tax legislation.'

‘Allow companies to carry losses forward’

‘The Government adopts many regulations that are in violation of the law adopted by the Parliament. Especially the Ministry of Finance and Economics, that doesn’t understand the mining sector specifics and is ready to change any law just to be able to collect Central budget revenues. This is our biggest concern.’

‘The tax laws need to be expanded and implementing regulations need to be adopted so that taxpayers can understand in advance their obligations. Need to develop a system of advance rulings from the tax department in response to taxpayer inquiries regarding specific issues and transactions.’

OTHER:

‘Need to continue efforts to control corruption in the Government service and in the courts – it exists at present but it is not too late to bring it under control.’

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