MINISTRY OF NATURE,
ENVIRONMENT AND TOURISM

GOVERNMENT OF
MONGOLIA

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AusAID

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Developing a cost-benefit analysis of mining sites in Mongolia
Annual Report - 2011

"Strengthening Environmental Governance in Mongolia"
Phase II

Physical destruction of Mongolia's nature
is a highly visible environmental cost

Ulaanbaatar
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1.   BACKGROUND OF THE PROJECT

Despite the continuous environmental policy reform since the early 1990s, Mongolia's environment is under considerable pressure from various threats, in particular livestock land use practices, mining development, hunting, rapid urban expansion and climate change. Mongolia has made impressive steps forward in developing its economy since the transition period of the early 1990s. In its traditional culture it also exhibits a reverence for the land, and an understanding of the need to conserve its precious resources. However, as is the case in many transition countries, the desire to develop quickly and raise living standards, is having an observable effect on environmental quality.

The effects of human activities on Mongolia's environment have worsened since the 1990s and key reasons for this have been poor implementation of environmental policies and a lack of transparency in government decision-making. Thus, the continued efforts of the Ministry of Nature, Environment and Tourism, the UNDP and their partners in tackling this issue is of paramount importance to securing a better future for Mongolia's environment and its people.

The second phase of the 'Strengthening Environmental Governance in Mongolia' project is funded by the Government of Mongolia, UNDP, UNEP and the Australian Agency for International Development (AusAID). The project phase will run for three years with a budget of US$1.5 million. It aims to assist the Government of Mongolia to achieve its objective to "improve consistency of policies for protection, proper use and rehabilitation of natural wealth; make transparent and accessible information related to nature and the environment, and; increase public participation and monitoring in the protection of nature".

The second phase of the project is built on the results and recommendations of the first phase. on the project has 3 components: (1) Streamlining and strengthening of Mongolia's environmental legislative framework; (2) Strengthening environmental mainstreaming mechanisms and (3) Strengthening capacity of NGOs/CSOs to engage in environmental governance processes.

The cost-benefit analysis of the mining sector, funded by the Australian Government, is part of the second component: Strengthening environmental mainstreaming mechanisms. The current report covers all activities carried out under the cost-benefit analysis in 2011.

2.   RESULTS OF THE COST-BENFIT ANALYSIS IN 2011.

In 2011, a start was made to develop the methodology to carry out the cost-benefit analysis and test it with available data. A team of international (environmental economist, mining experts) and national consultants (economist, mining expert, environmental and social experts) was recruited. The team started by reviewing which data is currently available to carry out this type of work and analyzing which policies are in place related to the scope of the study. Based on this initial review, the team designed the basic model for the analysis.

2.1   The Methodology
The project is required to develop a rigorous and innovative methodology to measure, model and value the impacts of mining on the physical and social environment. The approach followed was to design a model based on Excel, usingdata generated from the mining sector. The Excel-based model model consists of linked spreadsheets. The basic operating module consists of four spreadsheets:

- Benefits to the Mine
- Costs to the Mine
- Benefits to the Environment
- Costs to the Environment

Here, environment includes both the physical and social environment.

The choice of Excel over other software was based on its widespread use. No additional software would have to be purchased and no additional training would have to be carried out. Purchasing of additional software that requires specific training, could have become a significant threshold to use the model later on. The excel model will be easy to use for everyone and relatively easy to design.

The model in its initial design, compares benefits streams, both direct and indirect (or tangible and intangible) and costs streams, both direct and indirect (or tangible and intangible) in one master spreadsheet. By cascading several Master Spreadsheets laterally the CBA of several mines can be aggregated. By cascading several Master Spreadsheets vertically a comparison can be made between local and regional CBA values.

The model allows input values to be variable so that "what-if" scenarios can be played out and the impact of assigning costs and benefits to different stakeholders observed.
By projecting into the future, the model will show the difference in cost between the current plan, called Business as Usual or BAU and a sustainable mining plan which manages mining activity to reduce environmental and social costs associated with mining, called Sustainable Ecosystem Management or SEM."Sliders" on the Excel model make it simple to use and allow easy moving of costs to internalize "Externalities" (see below). This will be a key feature of the model and it will permit the user to quickly see changes in the CBA ratio by reallocating costs and improving benefits.

Figure 1: Fragment of the model showing environmental costs that can be altered with slides (see right bottom)

2.2   Data collection

In order for the model to function effectively, a large amount of data is needed. An extensive review was done of available sources, both in Mongolia and internationally. These sources included government published data and statistics (such as Annual Reports); public domain information from mining companies; donor publications (such as ADB, World Bank, WHO, UNDP, UNEP); and information from internationally recognized think tanks, such as Fraser Institute. A comprehensive series of meetings took place in Ulaanbaatar and at one mining site. Consultations were held with mining company executives in head offices, mine operators at the site, universities, central government ministries, local government administrators, local politicians, NGOs, and other donors.

2.3   Selection of sites and site visits

Gold and copper are among the largest export commodities of Mongolia and their share is only expected to grow in the future, with the opening of the country's largest coal and gold mines in the Gobi in recent years. Therefore it made sense to select one gold and one coal mine as target sites. Two sites were selected in cooperation with the Mineral Authority of Mongolia and Ministry of Nature, Environment and Tourism: Khushuut is a mid-size open pit coking coal mine located in Darvi soum of Khovd aimag in Western Mongolia. The mine is owned by *Mongolia Energy Corporation*, a Hong Kong listed public company and operated by *Leighton Asia.Olon Ovoot* gold mine is located in Mandal–Ovoo soum of Umnugovi aimag and is owned and operated by "*Olon Ovoot Gold" LLC*.

In November 2011, a site visit was made to Olon Ovoot Gold mine in the Gobi desert. Meetings were held with the mine operators who were at all times cordial and cooperative. Interviews with local administrators and elected representatives gave a less positive impression. The mine is in arrears over tax payments to the local government, who are initiating a court action. Concerns were expressed over mining tailings spoil heaps which contain cyanide. Allegations were made that animals and birds had died after ingesting mine tailings. Local herdsmen claimed groundwater levels were dropping in surrounding wells and public access roads had been blocked. Another complaint was that the mine does not use local suppliers of labor or foodstuffs, importing all food and drinks from Ulaanbaatar. Only 5 local men are employed while the total workforce of the mine is over 300.

It was not possible to visit the Khushuut coal mine in Khovd during the inception phase of the project. Analysis of mining and audit reports for the mine, and interviews with the mining company Mongolia Energy Corporation, served as input in designing the model. Since the mine has not started commercial operations yet, it was decided that applying the model to the mine would not provide relevant results. The Khushuut mine could be an interesting case study for further development of the excel model in the next phase of the project and a site visit is planned.

2.4   Data Limitations

Data is required in all sectors for both sides of the CBA, that is benefits and costs, and was found to vary in availability.

Mine Data: Mine benefits are clearly defined. They are represented by a profit margin to the mine operators and the payment of taxes, tariffs, fees and royalties to government. Although mine operators were reluctant to disclose confidential financial information on their profitability, the percentage of royalties to be paid is laid down by law and therefore not difficult to calculate.

Mine costs, in terms of operating costs, are readily available; in fact sometimes too much information is forthcoming. Mines do include environmental rehabilitation costs in their budgets and "donations" to local communities.

Environmental Data: Environmental benefits from mining are virtually non-existent as the maximum mine operators are required to do under rehabilitation is returning the mined area to its original state. This does not confer any benefits. Payment for use of natural resources can be construed as a benefit from the environment, not a benefit for the environment, but it is arguable if a true value is being assigned to such usage. For example, the water regulations stipulate tariffs but allow users to calculate their own usage and fee. This encourages under-reporting.

Environmental damage has been fairly well documented in Mongolia. MNET has compiled national figures for loss of natural resources and pollution. At the same time, the assigning of a cost figure to this damage is still in a very preliminary stage, although charges for use of natural resources are well documented in existing regulations. MNET have developed a somewhat complex methodology for calculating the costs of environmental damage which is based on empirical formulae in a Mongolian published textbook. MNET are currently assessing their estimates of environmental damage from over 200 mining companies and intend to seek redress. At the moment the valuation technique is still theoretical and could be challenged in the courts by the mines. A cross-check on the values calculated would be useful and a pilot study on actual values of lost grazing lands is proposed under this study.

Socio-Economic Data: Socio-economic benefits from mining are mainly reported in financial terms and there is a large amount of data on monetary flows in human development funds and sovereign wealth funds. The means by which this translates into actual social benefits for all Mongolia citizens is less well understood and the whole issue of investment of government mining revenues is under review.

Social impacts of mining are reasonably well understood. At a macro level, effects such as "Dutch Disease" are recognized as a potential threat and at the individual level, impacts such as a higher divorce rates due to separation of workers' families is suspected, but little attempt has been made so far in Mongolia to assign real costs to these impacts. A pilot study on actual divorce rates and emotional stress is proposed under this study.

An important point is that the usefulness of the model will be limited by the quality and accuracy of the data entered, and that will depend on full cooperation from the mining sector and from the government, to find the correct balance between the mine operations and the physical and social environment.

2.5   Testing the Methodology

The model has been used to test a hypothetical mine in Mongolia and to look at the operation of Olon Ovoot gold mine. It was intended to also trial Khushuut coal mine but as they are not yet operating commercially, this exercise was deferred until later in the project.

The model outputs show how costs can be assigned to the mine, or absorbed by the country, and how this results in benefits being transferred between them. The B/C ratio is calculated by the model and threshold values of acceptability have been stipulated at 1.18 for acceptance by the mining industry and 1.12 for acceptability by the country. The model simulates the BAU scenario and the SEM scenario and

indicates the relevant assigning of externalities in order to reach a balance acceptable to the mining fraternity and the country community.

The CBA which will allow horizontal comparison of mine to mine, or sector to sector, and vertical comparison of local impacts compared with regional impacts.

It is important to note that the current version is only a rough version of the modeling that will be developed eventually, which will require further research and testing on many of the issues, links and formulas nested inside the model. Also the monetization of certain benefits and costs will remain a challenge and there will be a limit on which indirect benefits and costs can be included because of the complexity they would add to the model.

2.6 Workshop
An Inception Workshop was held in Ulaanbaatar Hotel on 25th November 2011. The workshop was attended by about 30 participants, representing various interest groups such as government agencies, NGOs, private companies, research institutes and the project team. The outcome of the workshop was as follows:
- There was considerable interest from all participants in the study. The discussion was lively as evidenced by the time that it went on for, almost four hours.
- NGOs are keen to be involved in monitoring but MNET do not see this as appropriate.
- There was a clear demand for social costs and benefits to be included in the CBA analysis.
- It was suggested that health effects of miners (morbidity by 40 and mortality by 50) should be included in the CBA

As well as MNET, the Ministry of Health and another unidentified organization asked if they could use the model and be given training. It is promising that these three organizations immediately saw the use of the model.

3. CONCLUSIONS AND LESSONS LEARNT

Major lessons learnt were encountered in data availability. There is a large amount of cost data on mining activities but very little on environmental damage and hardly any on negative social impacts. Information on environmental benefits from mining was very scarce as well and information on social benefits remained limited to financial data.

In the workshop three separate organizations asked for permission to use the model. A recurring comment made by many parties was that the main issues of concern are social and environmental impacts. It is recommended that cognizance be taken of these comments and that social issues are given more prominence in the study.

The way forward

The general interest in the research and its innovative methodology, reflect the relevance of the work and confirm its niche. The current level of progress in developing the model is more advanced than expected. This is mainly due to the sound work and good technical expertise of the various experts involved. It proved to be an assignment that generated high interest among international and national experts, in particular because this type of studies is still an emerging concept around the world. Besides further testing and fine-tuning the existing model, clear recommendations need to be given to the

Mongolian government to review existing data collection systems at the local and national level, to avail a greater pool of existing data for future studies. As Mongolia has still a lot of strategic decisions to be made related to mining, the tool can be an important mechanism to make better informed decisions in the future.