



MAPPING THE DIGITAL TRANSITION IN MONGOLIA'S MINING SECTOR: SUPPORTING THE ESTABLISHMENT OF A DIGITAL GEOLOGICAL DATABASE





The mining sector's sizeable contribution to economic growth and social development in a number of the resource-rich economies where the EBRD operates is well known. Perhaps less well known is the support the EBRD offers these countries to create and maintain some of the critical building blocks necessary to attract and sustain investment and ensure that the sector remains an engine of broader economic development.

“THE PROJECT, RECENTLY CONCLUDED BY THE BANK'S LEGAL TRANSITION PROGRAMME, GIVES MONGOLIA A CUTTING-EDGE DIGITAL PLATFORM TO CAPTURE, STORE, PROCESS, ANALYSE AND DISSEMINATE CRITICAL GEOLOGICAL INFORMATION ON THE COUNTRY'S EXISTING MINERAL RESOURCES AND POTENTIAL.”

This article examines an example of the Bank's support, provided through a technical cooperation project, to help design and establish a national geoscience database for Mongolia's National Geological Service. This project, recently concluded by the Bank's Legal Transition Programme, gives Mongolia a cutting-edge digital platform to capture, store, process, analyse and disseminate critical geological information on the country's existing mineral resources and potential. Mongolia also gains a critical tool to improve transparency, enhance governance and sustain broader economic development.

GEOLOGICAL DATA

Geological data or “geodata” are pieces of information, samples and records of the Earth's surface and subsurface, both onshore and offshore, obtained by *observation, measurement, sampling and description*. They are associated with a location relative to the Earth, including geographical and geological information.¹



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¹ British Geological Survey.

In the mining sector geodata may be used to publicise a country's mineral wealth and, in some cases, to generate revenues for government. The typical perception of geodata is that they are reserved for technical experts. However, geodata are essential to ensure that the development of minerals is properly governed and for the strategic development of natural resources, infrastructure and communities. For example, land and water degradation are inevitable when mining takes place in or near water, by dredging or other techniques. Illicit mining has already affected protected areas and national parks. Ecosystem destruction and deforestation of mining areas reduces quality of life, food and water and is highly problematic.

INTERNATIONAL EXPERIENCE

Global experience over several decades has shown that one of the most important precursors of a successful mining sector is the availability of good-quality information on its mining potential. That mining potential is measured in terms of geological potential of the territory, which will inform the level of investment and contribution to exports, national revenue, employment and industry.

Clear and accurate information about the location, potential quality and estimated quantity of deposits and resources is essential to support strategic development that includes levels of investment, potential markets, placement of infrastructure, environmental protection, social impacts, monitoring requirements and skills development.

Therefore, the availability of high-quality geodata is fundamental to building a comprehensive understanding of the wider potential of a country's mineral sector. Without such geodata it is pretty much impossible to attract the levels of investment necessary to explore or develop the sector proportionally to its geological potential. Geodata are the basis for every mineral resource discovery and essential for efficient resource exploitation.

The more accurate and developed geodata are, the greater likelihood that committed investors will readily enter the mining market. Countries that have non-digital, poor-quality digital or unreliable access to geoscience data (geological maps, reports and their associated information) and lack suitable capacity (both financial and skills-related) for the maintenance and ongoing development of these data will not be attractive to investors.

GENERATING GEODATA

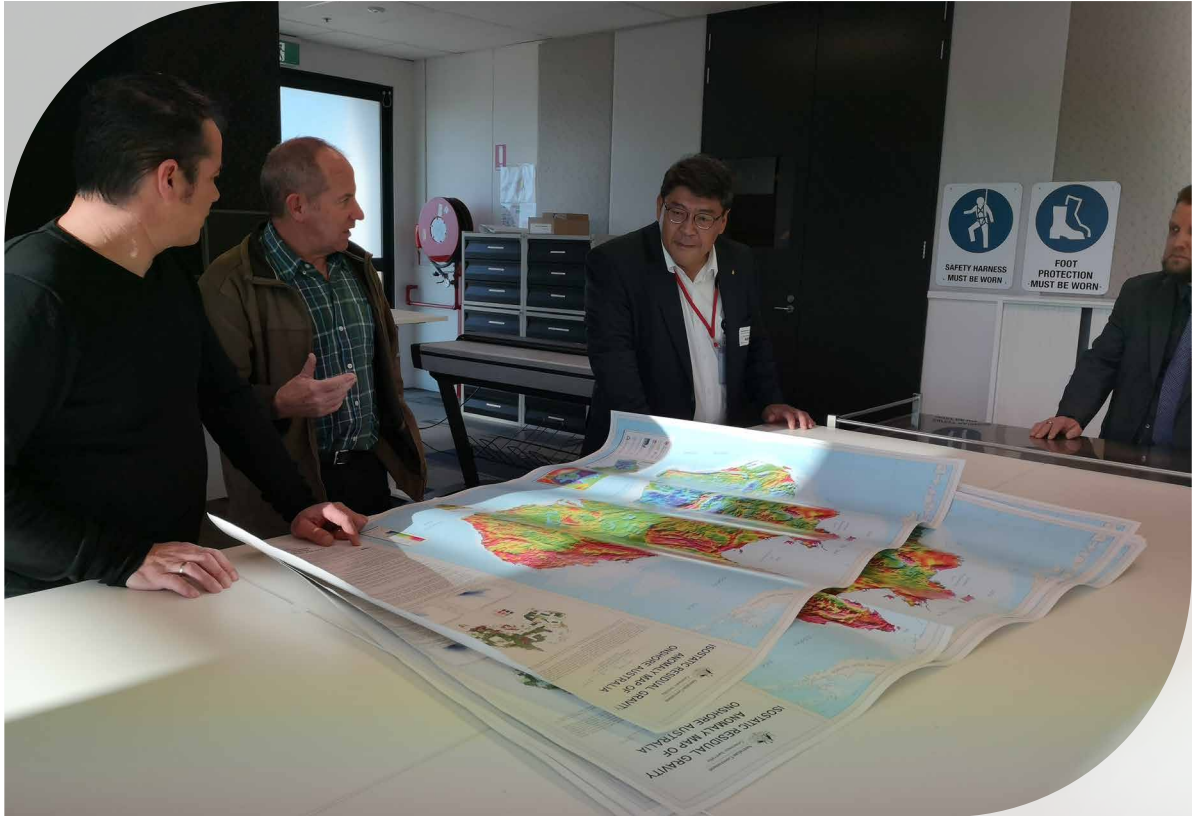
Generating geodata through state-sponsored surveys or as a requirement of exploration and mining licences is generally an expensive task. An investment in generating geodata (for example, through exploration activities) may not be returned because there is no guarantee that profitable resources are discovered. Thus, having access to data gathered during previous exploration campaigns can reduce investment risks significantly and lead and focus activities in the right direction, making the environment for investors more appealing.

DIRECT BENEFITS OF ACCESSIBLE GEODATA

Quality accessible geodata encourage mining companies to invest by reducing exploration risk, particularly private exploration companies that, with proper access to such information, are better able to identify and determine the viability of exploration targets. It also helps governments to understand their mining potential, allowing them to regulate activities properly and plan economic development in a sustainable manner. Simply put, making geodata easily and readily available to government and industry enables effective decision-making.

It is clear that geodata represent one of the components driving informed strategic decisions on economic and social development. More broadly, geodata provide a foundation to facilitate economic growth (by stimulating industry and inward investment), social development (through jobs and security, transparency and reduction in corruption) and improved environmental management.

“ THE POTENTIAL INVESTMENT THAT PUBLICLY AVAILABLE PRE-COMPETITIVE DATA CAN MOBILISE CAN FAR EXCEED THE REVENUE THAT ANY COUNTRY RECEIVES IN DEVELOPMENT ASSISTANCE. ”



Where to start? Geoscience Australia exchanging experience with the National Geological Survey.

USING GEODATA TO MOBILISE INVESTMENT

The potential investment that publicly available pre-competitive data can mobilise can far exceed the revenue that any country receives in development assistance. This position is supported by the Australian Department of Finance's *Strategic Review of Geoscience Australia*,² which found that government-owned pre-competitive data:

- play a key role in reducing risk for the resources industry, especially for private-sector exploration companies that are better able to determine exploration targets
- generate positive externalities in terms of new deposits providing information about regional prospectivity and comparable geological formations and
- help the government maximise the future value of resources that it owns on behalf of society (there are strong analogies to the due diligence and other costs in developing an investment prospectus for a major, complex asset).

GEODATA IN MONGOLIA

Given the importance of Mongolia's mineral activities to the country's development, it is unsurprising that quality accessible geodata have long been seen as a key pillar of an enabling modern, well-governed, competitive and investor-oriented mineral sector.

Unfortunately, access to such valuable geological information is restricted in some economies where the EBRD invests, as governments are reluctant to allow wider accessibility to geodata, believing sector development and national security would be better served by limiting access.

This was the case in Mongolia before the launch of the Bank's national geoscience database technical cooperation. The country's trove of geodata was scattered across millions of pages of paper maps and outdated digital (that is, PDF) collections. In addition, several agencies held,

² <https://www.finance.gov.au/archive-link/2011-strategic-review-geoscience-australia>

managed and delivered geodata in Mongolia, resulting in duplication of data collection, limited sharing of data between the agencies and no understanding of the country's total current geoscience data inventory. At the outset, there were also restrictions on the types of geodata that were publicly accessible.

With the limited digital data held by separate and independent agencies, it was extremely difficult for both domestic and foreign investors to evaluate Mongolia's resource potential when fundamental geoscientific datasets could not be provided in digital formats or accessed online. This also applied to Mongolian geoscientists, who were unable to use and integrate data in non-digital formats or to share data and collaborate to build expertise collectively. Prior to the technical cooperation on the national geoscience database, the absence of digital data reflected several factors:

- Restrictive policies and regulations related to national and regional digital data, with mineral sector regulations failing to require companies to submit digital data (both geoscientific data and administrative reporting) to the regulator; reports were only provided in hard-copy format. For geoscience datasets (for example, data from drill holes, geophysical surveys such as gravity or magnetic surveys), providing data as a picture in a hard-copy report effectively renders them unusable and does not support future value-adding activities using these data.
- Historical reports stored in hard-copy format in the regulator's library were not available in digital format and required digitisation (and translation from Russian/Mongolian to English and other languages).
- Information and communication technology infrastructure was insufficient to store and manage digital data appropriately (that is, databases and digital catalogues).

“GOVERNMENT-OWNED PRE-COMPETITIVE DATA PLAY A KEY ROLE IN REDUCING RISK FOR THE RESOURCES INDUSTRY.”

This restricted availability, inadequate access and the use of obsolete – especially non-digital – methods to record, manage, store and make available geological information in Mongolia were repeatedly cited as major obstacles to investment and, as a result, a significant barrier to more and better development of the mining sector.

Mapping and digitising existing structures and integrating them in one coherent online database system ensures that all information is accessible and consistent. This is a key step to attract increased investment, particularly into critical exploration activities.

EBRD/MONGOLIA DIALOGUE

It was against this background that the Bank engaged with the government, highlighting the benefits of permitting wider access as a means of influencing policy and the legal changes that would allow such availability and accessibility. The Bank's advocacy and dialogue paid off when the government agreed to important changes in policy and law allowing greater geodata availability and online accessibility.

POLICY AND LAW REFORM

The Mongolian State Minerals Policy (2014-25) was adopted in January 2014. It included guidelines to support the sustainable economic development of Mongolia's mining sector. The policy explicitly enabled the creation of a national geo-information database. The subsequent amendment to the Minerals Law included a provision to establish a national geological database, to be managed by the National Geological Survey.

Figure 1: How the National Geological Database works. Source: National Geological Survey, Mongolia



LAUNCH OF THE NATIONAL GEOSCIENCE DATABASE PROJECT

This change in policy and law enabled the launch of the Bank's National Geoscience Database project, with implementation beginning in January 2019 and concluding in December 2021. The Bank (through its Shareholder Special Fund) and the governments of Australia and Mongolia jointly funded the project.

The project initially worked with the Ministry for Mining and Heavy Industries and the Mineral Resources Regulatory Authority of Mongolia, which collaborated with the country's recently established National Geological Survey. The project designed and operationalised the database; established the process to acquire, digitise, store and manage geodata; trained and built capacity among policymakers and regulatory authorities; and fostered cooperation between Mongolian geological authorities and their peers abroad.

Specifically, the project designed and developed digital geochemical, geophysical and other datasets and created and implemented an information system to provide easy and efficient access to these data. The system handles geographic information data contained in reports kept in the regulator's library of technical reports and maps. Additionally, the system includes the facility to scan and archive technical reports.

OUTCOME

The outcome of the project provides Mongolia with a national geological database³ that represents a cutting-edge digital platform to capture, store, process, analyse and disseminate critical geological information on the country's existing mineral resources and potential.

³ The National Geological Database can be found here: <https://mrns.mn/#/>

BENEFITS OF THE DIGITAL GEOLOGICAL DATABASE

The key benefits of this database for the sector and the economy are twofold. First, it contributes substantially to improving the transparency and wider accessibility of a vital resource for the development of the mining sector. The greater the transparency, the lower the risk for responsible investors in entering the market. The lower the risk, the lower the cost of market entry, which should in turn translate into greater investor interest.

“MAKING GEODATA EASILY AND READILY AVAILABLE TO THE GOVERNMENT AND INDUSTRY ENABLES EFFECTIVE DECISION-MAKING.”

Second, the national geological database bolsters sector governance considerably by helping the government to better understand the country's resource potential and more accurately evaluate the risks and benefits of stages of mineral investment and mine development. This should enable the government to regulate activities properly and better plan economic development. The database also provides critical input to sector revenue management activities, ensuring that the government captures financial return and conserves and protects the country's limited resources. Simply put, making geodata easily and readily available to the government and industry enables effective decision-making.

VALUABLE EXPERIENCE

Given the extent of Mongolia's mining sector reforms, the country possesses rich experience on the effectiveness and impact of these reforms, good and bad. As exposure of Mongolia's successes (such as the national geological

Vast mineral riches lie beneath Mongolia's land surface.





database) increases, the clearer the example becomes – an example other countries can and should look to in their search for workable solutions for sector challenges.

The national geological database is a project that is very important for the EBRD, not only in terms of its contributions to transparency and improving the investment environment, but also in terms of what the Bank has learned from the time spent helping to make the database a reality.

Drawing on this rich experience, the EBRD has begun working with governments and geology services in the region on how best to leverage the vast trove of geological data that they possess to drive investment, more sustainable development of the sector and, more broadly, the economy.

“IT IS CLEAR THAT GEODATA PROVIDE A FOUNDATION TO FACILITATE ECONOMIC GROWTH, SOCIAL DEVELOPMENT, AND IMPROVED ENVIRONMENTAL MANAGEMENT.”

