

# Terminal Evaluation

## Middle East

### 1. Outline of the Project

**Country:**

Morocco

**Project title:**

Project on Upgrading Exploration Technology of Mineral Resources

**Issue/Sector:**

Mining

**Cooperation scheme:**

Project-type Technical Cooperation

**Division in charge:**

Second Technical Cooperation Division, Mining and Industrial Development Cooperation Department

**Total cost:**

491 Million Yen

**Period of Cooperation**

1 April 1998 - 31 March 2002

**Partner Country's Implementing Organization:**

Bureau de Recherches et de Participations Minières (BRPM)

**Supporting Organization in Japan:**

Mineral and Natural Resources Division, Agency for Natural Resources and Energy  
Metal Mining Agency of Japan (MMAJ)  
Japan Mining Engineering Center for International Cooperation (JMEC)

**Related Cooperation:**

Dispatch of Experts  
Development Studies  
Mini-Project; "Training for Teams for Research of mineral Deposits"

### 1-1 Background of the Project

The economy of Morocco is heavily dependent on a limited number of industries such as agriculture, fisheries and tourism. The economy is unstable because of this structural characteristic and easily affected by the ups and downs of these industries. The Kingdom of Morocco aimed at achieving stability and economic growth through strengthening of the mining sector.

The Government of Japan has provided various types of technical cooperation for exploration of ore deposits, such as the dispatch of experts, development studies, and a mini-project to BRPM under the supervision of the Ministry of Energy and Mines over the past 30 years. After the end of the mini-project, Morocco shifted from exploring deposits which were visible aboveground to exploring "blind ore deposits". In an effort to acquire the advanced technology of mineral exploration needed to accomplish the shift, the Government of Morocco requested technical cooperation from Japan to improve the exploration, selection and other capacities of BRPM.

### 1-2 Project Overview

The Project is aimed at raising BRPM's capacity to regularly conduct organizational and practical exploration by way of transfer of the technology needed for exploration of blind ore deposits.

#### (1) Overall Goal

New mineral resources will be found in Morocco.

#### (2) Project Purpose

BRPM will be able to continuously carry out systematic and practical exploration.

### (3) Outputs

- 1) The Organization of the Exploration Department of BRPM will be improved and the department will operate efficiently.
- 2) Equipment will be efficiently operated and properly maintained.
- 3) Planning method for efficient exploration will be acquired.
- 4) Practical technology on exploration will be acquired.
- 5) Comprehensive exploration technology will be acquired.
- 6) Manuals on exploration technology will be available for BRPM use.
- 7) A system of transferring exploration technology will be established in BRPM.

### (4) Inputs

Japanese side:

Long-term Experts	7	Equipment	60 Million Yen
Short-term Experts	20	Local Cost	15 Million Yen
Trainees received	7		

Moroccan Side:

Counterparts	32		
Local Cost		21.79 Million DH (280 Million Yen)	

## 2. Evaluation Team

### Members of Evaluation Team

Team Leader: Masaaki KATO, Director, Second Technical Cooperation Division, Mining and Industrial Development Cooperation Department, JICA  
Mineral Exploration: Toshio SAKASEGAWA, Metal Mining Agency of Japan  
Technical Cooperation Planning: Akiko OZAWA, Japan Mining Engineering Center for International Cooperation  
Evaluation Management: Makoto IWASE, Second Technical Cooperation Division, Mining and Industrial Development Cooperation Department, JICA  
Evaluation Analysis: Tomihide CHISHINA, Sekkei Keikaku, Inc.  
Interpreter: ToToshiyuki MORITA, Japan International Cooperation Center

### Period of Evaluation

21 October 2001 - 3 November 2001

**Type of Evaluation:**  
Terminal Evaluation

## 3. Results of Evaluation

### 3-1 Summary of Evaluation Results

---

#### (1) Relevance

The National Development Program of Morocco emphasizes exploration, research and development of its mineral resources, aiming at a departure from its excessive dependence on phosphate rocks, and at promoting exports by providing support for the development of the main industries. Morocco has been loyal to this policy since the beginning of the Project. In addition, the main industries of Morocco, such as agriculture and tourism, have operated in an environment of decline in recent years, and thus the Government of Morocco has high expectations for the development of mineral resources.

Japan has provided with various kinds of cooperation to the mining industry of Morocco since 1975. However, the areas in which mines are visible aboveground have decreased, while the development of blind ore deposits has recently gained importance. Therefore, the project is important in its function to wrap up and institutionalize exploration technology based on the accumulated technologies transferred to BRPM in past Japanese cooperation. Thus, the implementation of the Project is appropriate and the relevance is high.

## (2) Effectiveness

BRPM established a Staff Section consisting of leading staff members in order to set up the system necessary for technology transfer and worked hard to disseminate the acquired knowledge by way of the activities of the new section. Since its establishment, the new Staff Section has been enhanced and the number of personnel increased. As a result, BRPM gained the necessary capacities for an integrated and practical exploration approach comprising establishment of the field exploration plan, its execution, and analysis of the results. The technical level has reached an appropriate level both in terms of exploration and operation and daily maintenance of the analytical equipment. The Exploration Manual has been compiled mainly by the counterparts based on results of technical transfer.

Therefore, the initial project purpose to enable BRPM to carry out its organizational and practical exploration is evaluated as having been achieved.

## (3) Efficiency

Timing of installation, quality and number of dispatched experts, supply of equipment, training for counterparts, distribution of counterparts and by the Moroccan side local cost particulars were all carried out without problems. As for the dispatch of experts, the timing of the second team of long-term experts was fairly favorable, achieving a well-balanced combination of theory and practice. This was made possible by shifting the focus of their Training from lectures to field studies when the second team took over. The dispatch of short-term experts was conducted efficiently when necessary for the purpose of conducting seminars and compiling the exploration manual, which were included in project activities based on a comment in the mid-term evaluation that it was necessary to record the content of technology transfer activities.

## (4) Impact

The Overall Purpose of finding new mineral resources in Morocco has not yet been achieved, but there are reports that some examples of the comprehensive approach to exploration carried out by BRPM have indirectly contributed to findings of massive sulfide deposits in Khwadra and gold deposits in Anti Atlas. In addition, the technical information accumulated through the activities of BRPM has been distributed outside BRPM through exchanges of information and technology with local research institutions and universities as a result of the Project.

## (5) Sustainability

Of the BRPM budget, 60 percent is provided by government subsidies and the remainder is revenues from the dividends of mining areas and royalties. Continual support from the government is expected, and the status of BRPM as a public institution for mineral resources exploration is planned, securing sustainability.

It is expected that the Staff Section established during the Project will share the knowledge and experiences in the specialized areas within the section and take a central responsibility in the dissemination of accumulated exploration technology and internal technology transfer. The Staff Section, it is expected, will be maintained after the project period and expansion of its functions is planned as well.

BRPM has established a system in which techniques, which are at a high level owing to the past cooperation, are fully utilized organizationally through the implementation of the Project. From this, exploration activities are considered to be sustainable.

## **3-2 Factors that promoted realization of effects**

---

### (1) Factors concerning Planning

Against the background that the concentration of prospective mines was blind ore deposits, BRPM recognized the necessity of acquiring a logical background and comprehensive exploration techniques. This awareness led to the success of Project because their attitude change coincided with the needs of the counterparts who were potentially very well skilled.

### (2) Factors concerning the Implementation Process

- 1) The technology and knowledge needed for the practical comprehensive exploration were transferred through on-the-job training (OJT) by the long-term experts. OJT was conducted during more than 100 days of field exploration a year.
- 2) Since the Staff Section established for the internal technology transfer functioned continuously during the Project, even non-full-time counterparts were able to take advantage of the opportunities to acquire new techniques through participation in seminars and field studies and generating reports, while performing their normal duties. Therefore, activities were carried out efficiently with a limited number of staff members.

### **3-3 Factors that impeded realization of effects**

---

#### (1) Factors concerning Planning

N/A

#### (2) Factors concerning the Implementation Process

- 1) The delay of Japanese experts at the beginning of the Project was also caused a delay in technical transfer activities.
- 2) The number of non full-time counterparts of the Staff Section increased from 7 to 32 and, as a result, sufficient guidance and discussion were not possible for all of counterparts during field exploration due to time constraints.

### **3-4 Conclusion**

---

From the results of the Project activities, the Project purpose of "BRPM will be able to continuously carry out systematic and practical exploration" was considered achieved.

### **3-5 Recommendations**

---

- (1) The Staff Section, the core of internal technology transfer, should be maintained even after project period so that the transferred advanced exploration technology is extended both inside and outside of BRPM through the activities of the Section.
- (2) Regarding to the output of the Project, such as the Exploration Manual and the Comprehensive Interpretation Reports, etc., it is recommended that further improvement and enrichment of the contents be made by BRPM based on information on ore deposits and data from the results of exploration activities.

### **3-6 Lessons Learned**

---

Compiling of the Exploration Manual and Comprehensive Interpretation Reports have played an important role in maintaining and disseminating the results of the Project, since these materials have turned the intangible results of the transferred advanced exploration technology into tangible results. The Project will become one of the model cases with the results of the transferred technology in a highly visible form.

### **3-7 Follow-up Situation**

---

The dispatch of short-term experts was planned but not realized on GIS's effective control, management and maintenance as one of the components of Project-type Technical Cooperation; this was due to a delay in the provision of installation equipment required by the short-term experts. As a follow-up activity an expert was dispatched for this purpose in June 2002.