

# Exploration and Evaluation of Underground Resources



Project Sites Ankara

## 1. Background of Project

As the JICA office was established in Ankara in February 1995, the leaders of both Japan and Turkey agreed to consider the possibility of carrying out technical cooperation for Central Asia together. It was decided that as a cooperative project, a third country training program would be appropriate, and possible projects were discussed. A proposal from Japanese experts on cooperation in the field of mineral resources development was adopted after considerable discussion, since JICA has more than 20 years of experience in mineral resources development in Turkey. The cooperation had become finalized by the official request from the Government of Turkey.

In 1996, Japan carried out the preliminary study and decided to execute a third country training program with the General Directorate of Mineral Research and Exploration (MTA). The MTA has been playing a central role in mineral resources research in Turkey and has been cooperating<sup>1)</sup> with JICA for more than twenty years.

## 2. Project Overview

### (1) Period of Cooperation

FY1996 – FY2000

### (2) Type of Cooperation

Third Country Group Training

### (3) Partner Country's Implementing Organization

General Directorate of Mineral Research and Exploration (MTA), Prime Ministry

### (4) Narrative Summary

#### 1) Overall Goal

The participants' knowledge and skills on explorations and evaluations on their countries' mineral resources are improved.

#### 2) Project Purpose

The technology of investigation, mining, and pro-

cessing of the mineral stones in the participating countries is improved, and cooperative work between the participating countries is promoted by sharing knowledge on processing the underground resources.

### 3) Outputs

- a) The participants' exploration, exploitation, and management techniques of mineral resources are improved.
- b) The participants' knowledge on the management of underground resources is exchanged and shared.
- c) Basic technical skills for the latest method of resources development are acquired.

### 4) Inputs

#### Japanese Side

Short-term experts	6
Trainees received	3
Training expenses	37 million yen

#### Turkish Side

Lecturers	107
Facilities and vehicles	

### (5) Participant Countries

Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan, and Bosnia and Herzegovina.

## 3. Members of Evaluation Team

JICA Turkey Office

## 4. Period of Evaluation

December 2000

## 5. Results of Evaluation

### (1) Relevance

This program is in line with the Turkish diplomatic policy, which aims to reinforce the ties between the Central Asian countries that participated in the training. It is also in accordance with the needs of the participating countries that place considerable emphasis on the development of the various underground resources for economical development.

Founded as a Turkish implementing institution in 1935, the MTA has considerable experience in conducting international projects in the field of underground resources. Cooperation to such an institution is relevant because the extension of training output is effective.

Out of the total five training programs, the applicants for the 2nd, 3rd, and 4th programs were 28, 36, and 33 respectively. These exceeded the fixed limit of 25, which shows a high need for training in the participating countries.

### (2) Effectiveness

The training contents were sufficient for the achievement of training objectives, and the training participants were in a generally satisfactory level. The training program was considered legitimate for the participants' understanding and acquisition of technology. Many of the training participants also commented that the training was useful for improving their knowledge and technological abilities in relation to underground resources development. Therefore, the program objectives can be considered to have been achieved.

### (3) Efficiency

The MTA has staff with substantial experience, and a varied network of contacts, thus the lecturers were with suitable levels and appropriate fields to conduct the training programs. The connection between MTA and JICA is good, and the efficiency of the program was high. However, the late participation of some of the trainees, and the false declaration of their language skills obstructed the training progress.

### (4) Impact

The training participants are expected to make use of the training results in the future, since the aimed level of knowledge and technology was acquired.

### (5) Sustainability

The MTA has a more than 60-year history in mineral resources research, and it is the best Turkish research institute in this field. The MTA has been very eager about the training, has abundant human resources and can ensure that there will be no discontinuation caused by personnel transfers. As long as the MTA carries the third country



Visit of a digging area

training program, there should be no problems with its sustainability concerning institution and equipment. In this training, the independence of the MTA was questioned because the rate of the external lecturers was high (maximum of 37%). However, it was agreed that the number will be decreased to 20-25%.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

In order to execute a third country training program effectively, it is necessary that the level of the training participants' understanding matches that of the contents of the training course. The participants should be widely recruited through the related organizations of the participating countries and the previous participants. It is necessary that the participants' skills are carefully assessed, including linguistic skill.

### (2) Recommendations

In response to the strong requests of the participating countries, it is desirable to extend this training for five years. However, it is necessary to improve the quality of the training by using audio-visual equipment, and/or revising the textbook. Moreover, it is necessary to revise the field work program to make the training more practical.

## 7. Follow-up Situation

The above suggestion has been taken to extend this training for five years from 2001 to 2005.

<sup>1)</sup> The Metal Resource Projects were carried out in 1974–1976, 1977–1980, 1984–1987, 1988–1991, 1995–1997, and the Subterranean Heat Energy Project was carried out in 1986–1989.

# Improvement of Mine Safety Technologies



Project Sites Zonguldak

## 1. Background of Project

The Government of Turkey has proceeded with the coal development policy in order to cope with domestic shortages in the electric power supply. However, in domestic coal mines, the disaster and fatal accidents were repeated every year with about 20 fatalities, including the gas and coal dust explosion that led to 103 fatalities in 1983. In March 1992, a catastrophic gas and coal dust explosion took place at Kozlu colliery of the Turkish Hard Coal Enterprise (TTK) in the Zonguldak area leading to 265 deaths.

For the purpose of decreasing serious accidents and securing the safety of coal mine workers, TTK has asked the Japanese Government for a project-type technical cooperation in June 1992, since Japan has similar geological conditions and has high technology when it comes to coal mine safety.

## 2. Project Overview

### (1) Period of Cooperation

1 November 1995 – 31 October 2000

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Turkish Hard Coal Enterprise (TTK)

### (4) Narrative Summary

#### 1) Overall Goal

Coal mine disasters in the Republic of Turkey are decreased.

#### 2) Project Purpose

The prevention technology of coal mine disasters of TTK is improved.

#### 3) Outputs

- The safety control technology is improved.
- Technology of disaster prevention is improved.
- The maintenance management technology for the

safety equipments is established.

- Education and training technology is improved.

### 4) Inputs

#### Japanese Side

Long-term experts	8
Short-term experts	14
Trainees received	14
Equipment	276 million yen
Local cost	17 million yen

#### Turkish Side

Counterparts	37
Land, facilities and equipment	
Local cost	approx. 152.4 billion Turkish Lira (approx. 18 million yen)

## 3. Members of Evaluation Team

### Team Leader:

Ken TAKAHASHI, Technical Director, Japan Coal Energy Center

### Technical Cooperation Planning:

Takashi ISOBE, Deputy Director, Mine Safety Division & Coal Mine Safety Office, Environmental Protection and Industrial Location Bureau, Ministry of International Trade and Industry

### Evaluation Administration:

Tomoyuki UDA, Second Technical Cooperation Division, Mining and Industrial Development Cooperation Department, JICA

### Evaluation Analysis:

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## 4. Period of Evaluation

8 May 2000 – 26 May 2000

## 5. Results of Evaluation

### (1) Relevance

The Government of Turkey has continued to develop and rationalize the coal mining industry increase the production of coal, and to increase its competitiveness on the international market. However, securing coal mine safety is also indispensable to the improvement of productivity. Therefore, this project has conformity with Turkish coal development policy and is deemed highly relevant.

### (2) Effectiveness

This project has progressed very smoothly, and the four targeted outputs have been practically attained. During the project period, the number of accidents in the coal mines under the TTK jurisdiction decreased greatly from 35,557 cases in 1985 – 1989 to 11,470 cases in 1995 – 1999. The number of deaths, injuries, and the frequency of accidents has also declined every year.

Great progress was observed during the project period. There were no serious accidents at any of the coal mines under the TTK, and the daily administration functions improved. Therefore, the project contributes to the achievement of the improvement of the coal mine disaster prevention technology.

### (3) Efficiency

The dispatch of experts and the supply of equipment from Japan were timely, and the equipment was managed well and utilized effectively.

Although there were repeated changes of the TTK executive officers due to changes in the Turkish government, no counterparts had left the job during the project period. The technology transfer was carried out effectively.

The supply of land, facilities, and equipment from the Turkish side, was mostly satisfactory in quality and in quantity in spite of the severe financial circumstances.

### (4) Impact

The output of the project is extended by holding seminars in which the engineers outside of TTK participate (e.g. the Turkey Energy Conference), by conducting presentations at academic society (e.g. the Turkish coal academic society), and by reception of study tours on latest safety technology including the central control unit introduced by this project. Therefore, a decrease in the disaster occurrence rate could be expected in coal mines outside of the TTK jurisdiction.

### (5) Sustainability

Although there are some financial concerns, there will be no major changes in the coal-centered Turkish energy policy, therefore support from the government is expected to continue.

Since the TTK is very eager for technological innova-



The handover ceremony of respiratory equipment

tion in both safety and production, no problem is seen with the sustainability of safety control management.

However, in fiscal year 1999, 385 skilled mine workers retired voluntarily. Also in January 2000, 4,012 workers were recruited as an employment measure for earthquake-damaged areas, and also for further increase in coal production. The increase in unskilled workers is bound to affect safety in the mines.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

Extra activities by long-term experts such as the compilation of a mining terminology dictionary (Turkish/English/Japanese) and Turkish grammar notes, successfully promoted smooth implementation of the project.

### (2) Recommendations

TTK recruited 4,012 coal mine workers in January 2000 as an employment measure for areas damaged by the earthquake in August 1999. In the future, it will be necessary to provide these pit workers with a well-planned and satisfactory safety education. It is also necessary to consider implementing a follow-up project as needed.

## 7. Follow-up Situation

TTK's coal mining spot is shifting to deeper areas and new problems regarding safety and mining technology have arisen. It is necessary to introduce new technology to cope with these problems, so the dispatch of an individual expert who can provide extensive guidance and advice on safety and production technology was requested. Since February 2002, an expert on "improvement in coal mine safety and the coal mining rationalization" has been dispatched, in response.