Summary Report of the Evaluation Study

<table>
<tr><td colspan="3">1. Outline of the Project</td></tr>
<tr><td colspan="2">Country: The Republic of Turkey</td><td>Project Name: Geologic Remote Sensing Project</td></tr>
<tr><td colspan="2">Sector：Mineral Resources Research, Natural Hazard Prevention and Environmental Studies</td><td>Cooperation Type：Project-Type Technical Cooperation</td></tr>
<tr><td colspan="2">Competent Division：Natural Resources and Energy Conservation Team: Resources and Energy Conservation Team, Group II, Economic Development Department</td><td>Cooperation Amount：
Approximately 430 million yen</td></tr>
<tr><td rowspan="4">Cooperation Period</td><td>(R/D)：2002.8.1 – 2006.7.31</td><td>Implementing Agency ： The General Directorate of Mineral Research and Exploration (MTA)</td></tr>
<tr><td>(Extension)： －</td><td>Cooperation Agency：Japan International Cooperation Agency (JICA)</td></tr>
<tr><td>(F/U)： －</td><td>Other Donors：</td></tr>
<tr><td>(E/N)(Grant Aid)</td><td></td></tr>
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1-1 Background and Outline of the Cooperation

The geologic environment of the Turkey shows the potentiality for the existence of various mineral resources. The General Directorate of Mineral Research and Exploration has taken the lead in the mineral resource exploration in the country. The development of outcrop deposits that leave traces on the earth has been almost completed and exploration of concealed deposits is being pursued. In 1975, the MTA established the remote sensing division to deal with the requirement for the concealed-deposits exploration based on regional geomorphologic and geological information, and they have promoted the introduction of the technology independently. However, the existing technology and equipment are not sufficient for the efficient data processing and analysis utilized for the concealed-deposit explorations, and those obstruct the long- and short-term exploration activities for obtaining the resources.

In addition, there is tendency to apply the remote sensing to the active-fault survey and monitoring of ground surface movement in the world. In the MTA, the upgrading the analyzing technology in these fields becomes the assignment.

With these points as background, the Turkish Government requested the technical cooperation aiming at the progress of mineral resources exploration, national disaster protection and environmental prevention studies by introducing the advanced remote sensing technology to Japanese Government. In response to the request, this Project has been implemented in August 2002.

1-2 Details of the Cooperation

(1) Overall Goal

MTA/Remote Sensing Center (RSC) plays the central roles in providing advanced remote sensing services in Turkey and neighboring countries

(2) Project Purpose

MTA/RSC is able to utilize the advanced remotely sensed data such as ASTER and/or PALSAR data for geological analysis aiming at mineral resources exploration, natural disaster prevention and environmental conservation studies

(3) Output

1) The project operation unit (RSC) is established.
2) Equipment and advanced satellite data necessary for utilizing satellite data are operated and maintained properly.
3) Image processing of ASTER data for mineral resources exploration can be carried out by the Counterpart (C/P) personnel.
4) Case studies for mineral resources exploration utilizing ASTER data are accumulated.
5) Spatial analyses with GIS are carried out by the C/P personnel.
6) C/P personnel can provide reliable products of SAR and ASTER data for improved hazard analysis by the staffs of relevant section of MTA and other related organizations.
7) C/P personnel can provide reliable products of advanced remotely sensed data for improved environmental analysis by the staffs of relevant section of the MTA and other governmental offices.
8) MTA/RSC can provide necessary technical support to implement training courses.

(4) Input (actual result)

Japanese Side

Long-term Experts	5	persons	Provision of Equipment	89,250 ×10³ Yen
Short-term Experts	14	persons		
C/P Training in Japan	8	persons		

Turkish Side

Counterparts	Full-time	8 persons	Local Cost	1,003 ×10³ YTL
	Part-time	5 persons		
Land and Facilities, etc	Offices, equipment, internet etc			

2. The Summary of Evaluation Team

Members (Field in Charge: Name: Employment/Title)

Leader	Mr. Koji Nakui	Executive Technical Advisor to the Director General, Economic Development Department, JICA

Remote Sensing Technology	Mr. Yosuke Suzuki	Executive Director, International Cooperation Dept., Japan Mining Engineering Center for International Cooperation (JMEC)
Project Management	Ms. Itsuka Ikehara	Staff, Natural Resources and Energy Conservation Team, Group II, Economic Development Department, JICA
Evaluation Analysis	Mr. Kenichi Kumagai	Representative Director, International Consulting Services Co., Ltd.
Evaluation	From February 19 to March 5, 2006	Evaluation Stage: Terminal

3. Outline of the Evaluation

3-1 Project Performance

- Input was appropriate as planed.
- Planed almost all Activities will be completed However, the completion of technology transfer of InSAR data utilization (6.3 and 6.4) required multi-period data is considered to be difficult due to the delay of launching of PALSAR.
- The Outputs will be achieved. (Excluding the output achieved by the utilization of SAR data, which was obstructed by a Important Assumption)
- The Project Purpose will be achieved and the implementation process is excellent.

3-2 Summary of the Evaluation

(1) Relevance

According to the National Development Plan, strengthening the development and production in mining sector is important issue in Turkey. Therefore, development of the mineral exploration technology utilizing advanced technology corresponds with that policy.

In addition to that, the establishment of the information and data system regarding to the environmental conservation is also mentioned as a key issue in the Plan.

As the advanced remote sensing technologies developed in Japan, such as ASTER, are highly applicable to these subjects, the Project Purpose and the Overall Goal are consistent with the national policy of the Turkey.

(2) Effectiveness

The methodology for exploration and the diagnosis for environment and disaster will be established; and the promising areas for mineral exploration will be extracted. Moreover, C/Ps have been able to transfer the acquired technology to the other institutions and other countries. Therefore, it is evident that the achievement of the Project Purpose is the results of the Project Outputs.

However, obtaining PALSAR data within the original Project period and the utilization of SAR data

became uncertain due to the delay of launch of the ALOS.

(3) Efficiency

Turkish C/Ps were allocated properly and Japanese experts were dispatched on time. Almost all of provided equipment has been utilized efficiently and the maintenance of the equipment was smooth by local procurements. Also, the local costs have been disbursed sufficiently in timely manner. Therefore, the Input contributed the achievement of Project Outputs.

(4) Impact

The usefulness of the ASTER data utilization was recognized in Turkey as the results of implementation of the Project and RSC has been carried the joint projects with other divisions/departments of MTA in response to their requests. Moreover, Project has already started to produce Impacts on the end users, as we can see in requests for image analyses and spectral measurements from mining companies. In addition to that, one joint research with a university was implemented, and another program with other university will start.

Also, the trainings for other institutions including Third Countries Training Program were carried out and the evaluation from participants was quite high.

(5) Sustainability

MTA/RSC was reorganized with the start of this Project and will be supported financially and methodically by MTA. RSC has strengthened the capacity of geological analysis through the utilization of advanced remote sensing data. This capacity was confirmed by the reliance expressed by related institutions. The sustainability of RSC will be assured by the effort of enhancing its service in providing products to the users.

3-3 Factors that Promoted Realization of Effect

(1) Factors Concerning the Planning

- The technical transfer has been carried out, focusing on groups. One group is consisted of experts in different fields, and the cooperation of the experts has generated the multiplier effect.
- The ASTER utilization technology is the latest, and its high quality has been proved through the case study.
- JICA could dispatch leading authorities in the fields of ARS technology as Long-/Short-term Experts.

(2) Factors Concerning the Implementation Process

- The leadership of Turkish Implementing Agency in the Project has been suburb.
- The talented full-time C/Ps has tackled the activities with intensity.
- The monitoring has operated very effectively, and its results have been reflected on the Project Activities.

3-4 Factors that Impeded Realization of Effect

(1) Factors Concerning the Planning

N/A

(2) Factors Concerning to the Implementation Process

A delay of launch of ALOS affected the implementation of technical transfer in the field of processing and application of PALSDAR data.

3-5 Conclusions

Project Purpose will be achieved. Plans aiming at securing the Sustainability have been discussed, and the Project has begun some activities for achieving the Overall Goal. Moreover, RSC is stable government organization from the viewpoints of finance and organizational system.

Therefore, the Sustainability of the Project is considered to be high.

3-6 Recommendations

(1) The enhancement of cooperation among other Ministries

To reflect the products of RSC for policy decision-making in the field of the environmental conservation and disaster prevention, the cooperation with the organization of other Ministries is important. However among the staff, especially engineers of Ministries, the cooperation on utilization of advanced remote sensing data is discussed, on personal basis in most cases. In order to actualize the join project, positive cooperation among the executives of Ministries and establishment of cross-sectional systems such as task force are desired.

(2) Enhancement of Training System

At present, the arrangement for TCTP in 2006 has been carried out; C/Ps have prepared for the Training held in May, from November. Due to the arrangement, flexibility of the Project activities has been decrease. While, the trainings at RSC are important for the technological upgrade of C/Ps and for the dissemination of advanced remote sensing technology. Therefore the studies on the establishment of organization for training management, preparation of training course models and so on that decrease the C/Ps burden on the preparation are required.

(3) Technological enhancement

The progress of advanced remote sensing technology is rapid and the duration of data acquisition of the sensor is limited because of its life. For the everlasting technological acquisition, the study on assuring the financial sources sufficient for the enhancement of cooperation with related foreign organizations, sending RSC staff to the international seminars and conferences for long-term are desired. In addition, MTA should keep RSC equipment and software updated to follow advanced technology on remote sensing.

(4) The contribution of international cooperation

Depending on the advanced technology and experience of international cooperation so far attained by the project, MTA can provide international service and assistance for problem solving in the field of mineral exploration and natural hazard prevention to other countries.

3-7 Lesson Learned

- The technology transfer have been carried out, focused on the case study group rather than

personnel, also a group is consisted of experts in different fields, and the cooperation of the experts has generated the multiplier effect.

- The detailed monitoring was carried out based on the indicators to each sub-item of activity; and through the verifications on the results of monitoring and arrangement countermeasures carried out by C/Ps and experts, thus the achievement the Outputs have been strictly pursued.