

Terminal Evaluation

Latin America and the Caribbean

1. Outline of the Project

- Country: Argentine Republic
- Project Name: Regional Geological Mapping with Advanced Satellite Data^[1]
- Sector: mining
- Cooperation Type: Project-Type Technical Cooperation
- Competent Division: Natural Resources and Energy Conservation Team, Group II, Economic Development Department
- Cooperation Amount: (at evaluation) Approximately 350 million yen
- Period of Cooperation
(R/D):
2001.3.1-2005.2.28
(Extension): -
(F/U): -
(E/N) (Grant Aid) -
- Implementing Agency: Argentine Geological and Mining Survey (SEGEMAR)
- Cooperation Agency: JICA
- Other Donors: -

1-1 Background and Outline of the Cooperation

The potentiality of existence of mineral resources in Argentina has been highly estimated; therefore the Argentine Government put the promotion of mining as a core to revive the economy. However the basic geological information required for exploring and developing the mineral resources have not been well arranged. To that end, the Argentine government has had its Geological and Thematic Maps National Program in operation since 1993, at the Argentine Geological and mining Survey (SEGEMAR). However, the shortages of personnel and equipment prevent these efforts from showing sufficient achievements. Under these circumstances, the Argentine government asked the Japanese government for project-type technical cooperation in an attempt to increase efficiency of geological and thematic maps by introducing advanced technologies for satellite data processing analysis and equipment and software required for those technologies. In response, the Japanese government conducted three short-term surveys from June through November 2000 in order to confirm the significance of the project and to draft a project document specifying the basic concepts, along with other details. In December 2000, JICA dispatched Japanese Implementation Study Team that signed R/D with SEGEMAR to start the Project. The four-year cooperation program started on March 1, 2001.

1-2 Details of the Cooperation

a. Project A

(1) Overall Goal

Geological maps and thematic maps^[2] for mineral exploration using advanced satellite data are prepared by Geology and Mineral Resources Institute (IGRM)^[3]

(2) Project Purpose

IGRM is able to utilize advanced satellite data such as ASTER^[4] and/or PALSAR^[5] in order to make geological maps and thematic maps for mineral exploration

(3) Outputs

1. System for utilizing satellite data is established.
2. Equipment and advanced satellite data are managed and maintained properly.

3. IGRM geologists have enough technology to utilize advanced satellite data such as ASTER and/or PALSAR on geological and thematic mapping for mineral exploration.

4. Usefulness of the remote sensing data is understood by the persons concerned and users through seminars and workshops.

(4) Input (actual result)

Japanese Side:

Long-term Experts: 4 persons Provision of Equipment: 91.5 million Yen

Short-term Experts: 22 persons C/P Training in Japan: 9 persons

Argentine Side:

Counterpart: Full-time 6 persons LocalCost: 341.500 pesos
Part-time 42 persons (at the evaluation)

b. Project B

(1) Overall Goal

Thematic maps for environmental conservation and hazard prevention are prepared by IGRM.

(2) Project Purpose

IGRM understands how to utilize advanced satellite data such as ASTER and/or PALSAR in environmental or hazardous area study.

(3) Outputs

1. System for utilizing satellite data is established.
2. Equipment and advanced satellite data are managed and maintained properly.
3. IGRM geologists understand how to utilize advanced satellite data such as ASTER and/or PALSAR in environmental or hazardous area study.

(4) Input

(Same as Project A)

2. The Summary of Evaluation Team

Members:

Leader:

Mr. Kiyoshi Masumoto, Team Director, Natural Resources and Energy Conservation Team, Group II, Economic Development Department, JICA

Remote Sensing Technology

Mr. Masatane Kato, Assistant General Manager, Department of Research and Development, Earth Remote Sensing Data Analysis Center

Project Management

Ms. Itsuka Ikehara, Staff, Natural Resources and Energy Conservation Team, Group II, Economic Development Department, JICA

Evaluation Analysis

Mr. Kenichi Kumagai, General Manager, International Cooperation Department, Industrial Services International Co., Ltd.

Period of Evaluation:

From September 23 to October 9, 2004

Evaluation Stage:

Terminal

3. Results of the Evaluation

3-1 Project Performance

- The Inputs as planned were done except the local cost. (However the shortage of the local cost had not given big influence to the Project.)
- The all planned activities are executed. (Except the PALSAR data practice, due to the postpone of the satellite launch)
- The Output of 'Project A' and 'Project B' will be achieved as the system for utilizing satellite data is established and C/P understand how to utilize such data in order to make geological maps and thematic maps.
- The Project Purpose of 'Project A' and 'Project B' will be achieved as C/P already made some geological maps and thematic maps based on transferred technology.
- The Implementation Process has been almost favorable.

3-2 Summary of Evaluation Results

(1) Relevance

[Project: A]

The project is relevant. The Argentine national strategy to foster the mining to be a main sector in the country has not changed since the start of the Project. The importance of the mining promotion that is considered to contribute to the future economic revival has been rather increasing. The 'national geological and thematic mapping' in conformity to the national strategy is indispensable for mineral exploration and development, and the ASTER data utilization, which was developed in Japan and is now under technical transfer in the Project, is adequate to increase the quality and efficiency of the mapping.

[Project B]

The project is relevant. The environmental conservation and hazard prevention policies have been rather strengthened as reform of the Mining Environmental Law is under consideration of the National Parliament. Society requirements have also been rising. Therefore the analysis and/or thematic map making use of ASTER data are anticipated to be promoted in various areas.

(2) Effectiveness

[Project A and B]

The effectiveness of the Project is high. The management system of the Project has been established; the equipment provided has been appropriately utilized and managed; the C/Ps acquired the technology needed for their own work. Thus, the Project Purpose will be achieved. C/Ps also deepen understanding through holding seminars and work shops for disseminating utilization of satellite data. As a result, several mining companies ordered ASTER image processing to SEGEMAR. That contributes the achievement of super goal.

(3) Efficiency

[Project A and B]

The Efficiency of the Project is high. The timing of C/P allocation is adequate, and the qualities of C/Ps are commendable; C/Ps have been coped with their subjects of the Project seriously. The provided equipments are suitable both in quality and quantity, and almost all the equipments have been fully utilized in the Project. However, at the beginning of the Project some problems with the timing occurred, such as delay of delivery of personal computers and delay of installation of Internet system, etc. Until 2002, there were delays of field survey caused by local cost disbursement. These problems, however, are solved now.

(4) Impact

[Project A and B]

The positive Impact is very big. The ASTER data is expected to be utilized in many fields, such as mineral resources development, oil resources development, environment and forestry. SEGEMAR has received orders for images from these users. The Impact has spread to the neighboring countries, because the MAPGAC, which is the geosciences project of multi-countries in Andes area supported by the Canadian Geological Survey, decided the policy to use the ASTER data. Until the end of the project, 8 geological maps and 2 metallogenic maps will be completed and over all goal will be achieved.

(5) Sustainability

[Project A and B]

If the financial base is reinforced, the sustainability will be high. The activities aiming at achieving the Overall Goal have been already started. It is expected that the new mineral exploration will be activated in its near future; and users' needs to the

geological and thematic maps using advanced remote sensing data are very high because these are useful for labor saving for exploration works. Also users have great expectation of the ASTER data utilization for environment and hazard monitoring. Through the project, C/Ps acquired enough skill to deal with ASTER data to respond users' expectation. SEGEMAR already built charge system on such services and the revenue is allocated to organizational expenses. It is clear that the disbursement of local cost has been improved now, but it is still difficult to estimate whether enough funding to manage the activities will be supplied after the Project completion.

3-3 Factors that Promoted Realization of Effects

(1) Factors Concerning to Planning

The ASTER utilization technology is the latest achievement in mapping techniques, and its high quality has been proved through the mapping work.

(2) Factors Concerning to the Implementation Process

C /Ps have acquired the technology of ASTER data utilization through their actual work, and they could concentrate their efforts to achieve the concrete goal, which is making maps of the assigned areas as their routine work.

3-4 Factors that Impeded Realization of Effects

(1) Factors Concerning the Planning

N/A

(2) Factors Concerning to the Implementation Process

- Due to the economical crisis in Argentina, the disbursement of local costs and exported equipment, and field survey became difficult until 2002.
- At the beginning of the Project, delays of purchasing PCs, Internet installation and its imperfection affected the Project activities.
However, these problems were solved at the evaluation.

3-5 Conclusion

The Project Purpose will be achieved as C/Ps already made more informative geological maps and thematic maps by utilizing satellite data. Furthermore, the Project has made a big impact on domestic and foreign users. The long-term plan aiming at increasing the Sustainability has been prepared, and the Project has advanced remarkably toward the achievement of the Overall Goal. The remaining issue of Sustainability for the Project is to secure the Government funds for continuing and enhancing the Project activities.

3-6 Recommendations

(1) For the sake of strengthening the 'Sustainability', SEGEMAR shall make more efforts to impress the Government about the usefulness of the advanced remote sensing technology in the field of natural resources exploration (minerals, oil, groundwater, forestry, soils etc,) and in the field of environment and hazard prevention. Moreover, SEGEMAR should consolidate its remote sensing working group into an advanced center for image processing, interpretation and training in the fields of mining, oil, groundwater, forestry, soils etc, in close cooperation with other Ministries and Provincial agencies concerned, in addition to the enhancement of the satellite data processing services to users for the purpose of creating the independent revenue sources.

(2) The C/Ps shall study continuously, keeping contact with the Japanese Experts to obtain the technological advices and interchanges.

(3) After the Project, continuous contact with JICA Argentine Office is recommended to inform the latest condition of SEGEMAR and request support if necessary

3-7 Lesson Learned

The C/Ps have acquired the transferred technology better than the SEGEMAR executives expected. This is the result that C/Ps have concentrated their efforts to achieve the quantitative goal that required making some sheets of maps as their routine work. It is worthy to note that the Experts give practical advice to solve the problems emerged from the C/Ps' routine work, as a good example of efficient technical transfer.

[1]

Remote sensing is the way of deriving information about the earth's land and water areas from images acquired from sensors put in aircraft or satellites.

[2]

Thematic maps stands for metallogenic maps and hazardous maps.

[3]

IGRM is one of research institutes of SEGEMAR. IGRM is consists of Remote Sensing GIS Division, DGAA (Environmental and Applied Geology Direction), DGR (Regional Geology Direction), DGRM (Geological Mining Resources Direction) and CTDR (Coordination of Regional Delegations)

[4]

ASTER stands for Advanced Spaceborne Thermal Emission and Reflection Radiometer. ASTER was developed by cooperative research between NASA and Japan's Ministry of Economy, Trade and Industry (METI). ASTER can capture high spatial resolution data compared with conventional sensors.

[5]

PALSAR stands for Phased Array type L-band Synthetic Aperture Radar. The sensor has a beam steerable in elevation, which allows us to obtain a wider swath. PALSAR is expected to utilized for mineral exploration and Environmental monitoring.