1．協議議事録（Minutes of Meetings ： M／M）

MINUTES OF MEETING
BETWEEN THE JAPANESE THIRD PREPARATORY STUDY TEAM AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE ARGENTINE REPUBLIC ON THE JAPANESE TECHNICAL COOPERATION FOR THE PROJECT ON REGIONAL GEOLOGICAL MAPPING WITH ADVANCED SATELLITE DATA IN THE ARGENTINE REPUBLIC

The Japanese Third Preparatory Study Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Kojiro Matsumoto, visited the Argentine Republic from October 31 to November 10, 2000 for the purpose of clarifying the background of the project proposal made by the authorities concerned of the Government of the Argentine Republic (hereinafter referred to as "the Argentine side"), discussing the concept and scope of the Japanese Project-Type Technical Cooperation for the Project on Regional Geological Mapping with Advanced Satellite Data (hereinafter referred to as "the Project").

During its stay in the Argentine Republic, the Team exchanged views and had a series of meetings on the Project with the Argentine side.

As a result of the meetings, both sides reached common understandings concerning the matters referred to the documents attached hereto.

Buenos Aires, November 7, 2000

Mr. Kojiro Matsumoto
Leader
Third Preparatory Study Team
Japan International Cooperation Agency
Japan

Mr. Juan Carlos Sabalúa
Executive Secretary
Argentine Geological and Mining Survey
(SEGEMAR)
The Argentine Republic

ATTACHED DOCUMENT

1 Name of the Project

Both sides agreed to use "The Project on Regional Geological Mapping with Advanced Satellite Data" as the name of the Project.

2 Implementing Agency of the Project

Argentine Geological and Mining Survey (Servicio Geologico Minero Argentino, hereinafter referred to as "SEGEMAR") under supervision of Secretariat of Energy and Mining, Ministry of Economy, will bear overall responsibility for the implementation of the Project.

The Project will be implemented at Geology and Mineral Resources Institute (Instituto de Geologia y Recursos Minerales, hereinafter referred to as "IGRM").

The present organization chart of SEGEMAR and IGRM is as shown in ANNEX 1.

3 Administration of the Project

President of SEGEMAR, as the Project Director, will bear overall responsibility for the coordination and implementation of the actions and proceedings in order to achieve the general goals of the Project.

Director of IGRM, as the Project Manager, will be responsible for the managerial and technical matters of the Project.

Director of Regional Geology Direction, the Acting Director of Remote Sensing and GIS Division, Director of Geological and Mining Resources Direction, and Environmental and Applied Geology Direction, as the Coordinators, will assist the Project Manager for the managerial and technical matters of the Project, such as planning, allocating budget, assigning necessary staff, monitoring, and coordinating with organization and/or directions concerned.

The organization chart for the administration of the Project is as shown in ANNEX 2.

4 Duration of the Project

The duration of the technical cooperation for the Project by the Government of Japan will be four (4) years from the date agreed by both sides in the Record of Discussions (hereinafter referred to as "R/D") to be concluded between JICA and SEGEMAR.

5 Site of the Project

The Project will be implemented at IGRM. The present address is as follows:
Address:Av. Julio A. Roca 651, 1322, Buenos Aires

The location map of the present premise is as shown in ANNEX 3.

IGRM explained to the Team that it had abandoned the plan to move to Parque Tecnológico Miguelete and still has possibility to move to another premise.

In this respect, the Team expressed some concern about the fact that the site of the project has not been determined, and requested that the Argentine side should decide the site by the end of November and to complete preparation before the Project starts, and the Argentine side agreed.

6 Master Plan of the Project

(1) Super Goal A

Geological maps and thematic maps prepared by IGRM are utilized by mining investors in Argentine.

(2) Overall Goal A

Geological maps and thematic maps for mineral exploration using advanced satellite data are prepared by IGRM.

(3) Project Purpose A

IGRM is able to utilize advanced satellite data such as Advanced Spaceborne Thermal Emission and Reflection Radiometer (hereinafter referred to as "ASTER") and/or PALSAR (Synthetic Aperture Radar sensor currently under development in Japan) in order to make geological maps and thematic maps for mineral exploration.

(4) Outputs A

1. Technology transfer system is established.
2. Equipment and advanced satellite data necessary for technology transfer are operated and maintained appropriately.
3. Counterparts are able to utilize advanced satellite data such as ASTER and/or PALSAR in order to make geological maps and thematic maps for mineral exploration.
4. Usefulness of the remote sensing data is understood by the persons concerned and users through seminars and workshops.

(5) Overall Goal B

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

(6) Project Purpose B

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

(7) Outputs B

1. Technology transfer system is established.
2. Equipment and advanced satellite data necessary for technology transfer are operated and maintained appropriately.
3. Counterparts understand how to utilize advanced satellite data such as ASTER and/or PALSAR in environmental and hazardous area study.

7 Fields of Technology Transfer

Both sides agreed that technology transfer from the Japanese experts to the Argentine counterparts (hereinafter referred to as "C/P") would be made in the following fields.

1. Data handling and fundamental concept of earth resources satellite data
2. Digital image processing and thematic mapping of alteration minerals and lithology with silica content by ASTER data
3. Application of ASTER data to geological mapping and mineral resources exploration
4. Microwave analysis using PALSAR data
5. Introduction to environmental analysis using ASTER and/or PALSAR data
6. Introduction to hazardous area analysis using ASTER and/or PALSAR data
7. Introduction to hyperspectral data analysis

The details of the fields of technology transfer are described in ANNEX 4.

8 Concept on Flow of Products and their Application in the Project

Both sides agreed that concept on flow of products, and their application for specific objectives as a whole, and the scope of the Project which is determined in "6 Master Plan" and "7 Fields of the Technology Transfer" within the flow is as shown in ANNEX 5.

9 Measures to be taken by the Japanese Side

The project will be carried out under the framework of Project-Type Technical Cooperation, which is the combination of the following three (3) components:

(1) Dispatch of Japanese Experts

(Long-term experts)

Both sides agreed that long-term experts would be dispatched in the following fields.

1. Chief advisor
2. Coordinator
3. Digital image processing
4. Geological remote sensing

(Short-term experts)

Both sides agreed that short-term experts would be dispatched in specific fields in relation to the fields of technology transfer as necessity arises.

At this moment, the experts in the following fields are expected to be dispatched:

1. Introduction of ASTER
2. Installation of DEM software
3. Installation of data management system
4. SAR data application
5. Environmental analysis
6. Hazardous area analysis
7. Hyperspectral data application

The requesting form for dispatch of Japanese experts (Form A1) should be submitted to the Government of Japan by the Argentine side at least two (2) months prior to the scheduled arrival date to the Argentine Republic.

(2) Training of C/P in Japan

The Team explained that a certain number of C/P would be accepted for training in Japan during the cooperation period according to the following program:

1. Number : Approximately two (2) yearly
2. Term : About a couple of weeks to two (2) months, depending upon the fields as well as the C/P dispatched to Japan
3. Fields : Remote sensing

The Argentine side requested the Team to accept four (4) or five (5) C/P yearly, but the Team replied that it is difficult for budgetary constraint of the Japanese side and the Argentine side understood.

The Team, further, requested the Argentine side and the latter agreed that the C/P may apply to other training courses conducted by JICA, however, sufficient consultation should be held between the Japanese experts and the C/P before the application to avoid impeding the smooth implementation of the Project.

The application form for the training program in Japan (Form A2A3) should be submitted to the Government of Japan by the Argentine side at least two (2) months prior to the scheduled arrival date to Japan.

(3) Provision of Equipment

Both sides confirmed the machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for technology transfer in the Project as shown in ANNEX 6, which is divided into the three (3) categories.

Among these three categories, the Argentine side requested to the Japanese side the provision of the Equipment shown as Category A.

The Team agreed to convey the request of the Argentine side as for the other Equipment in Category A to the Japanese authorities concerned, stating that the actual provision will be subject to the budget appropriation of the Government of Japan. However, the Team explained that provision of a vehicle is difficult because of budgetary constraint of the Japanese side and the Argentine side understood.

The Team explained and the Argentine side agreed that the costs and responsibility necessary for domestic transport, installation, adjustment, maintenance and repair of the Equipment should be borne by the Argentine side.

The requesting form for provision of equipment (Form A4) should be submitted to the Government of Japan by the Argentine side immediately after R/D has been signed.

10 Measures to be taken by the Government of the Argentine Republic

(1) Buildings and Facilities for the Project

The Argentine side will prepare the building and facilities necessary for the implementation of the Project. The layout of the present building and rooms is as shown in ANNEX 7.

The Team requested and the Argentine side agreed to prepare enough space for the provisional layout of facilities and equipment necessary for the Project, as shown in ANNEX 8, if IGRM moves to another premise which is mentioned in "5 Site of the Project".

Furthermore, Office space for the Japanese experts which are equipped properly with office equipment such as phones and a facsimile which have at least two (2) extension line for Japanese experts, one (1) international telephone line, electric wiring, LAN, and desks, will be prepared before the start of the Project.

(2) Long Term Assignment of C/P

For the successful implementation of the Project, the Argentine side will provide the full time and part time services of C/P who are listed in ANNEX 9 and the administrative personnel.

Should the allocation of C/P and the administrative personnel be changed for either the personnel or administrative reasons, the Argentine side will immediately take necessary measures to supplementary assign appropriate number of personnel for the Project.

(3) Machinery, Equipment and Materials

The Argentine side will supply at its own expenses machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than

those provided by the Government of Japan through JICA.

The Equipment that is now existing at IGRM and is able to be utilized for the Project is shown as Category B in ANNEX 6. The Team requested that the Argentine side should prepare vehicles for field survey and add it to Category B. The Argentine side explained that it is difficult to prepare vehicles surely when necessity arises, because schedule for allocation of vehicles in IGRM is decided six (6) months before the scheduled use. But the Team explained the necessity of timely allocation of vehicles and requested the Argentine side to secure them, and the Argentine side understood.

(4) Local Costs

The necessary amount of local costs by the Argentine side will be indispensable for the successful implementation of the Project.

In this regard, both sides confirmed that the cost necessary for operation of the Project, which is listed below, is to be borne by the Argentine side.

1. Expense for satellite data
2. Field allowance and transportation for ground truth
3. Expense for sample analysis
4. Allocation of temporary supportive staff for data processing, ground truth, etc.
5. Expense for workshops and seminars
6. Expense for consumable, electricity, etc.

The Argentine side presented the budgetary plan for these costs, which is shown as ANNEX 10.

(5) Privileges, Exemptions and Benefits to the Japanese Experts

In accordance with the provisions of article VI of the Agreement on Technical Cooperation between the Government of Japan and the Government of the Argentine Republic, signed in Tokyo on October 11, 1979, the Government of the Argentine Republic will grant in the Argentine Republic, privileges, exemptions and benefits to the Japanese experts and their families.

(6) Sustainability of the Project

The Argentine side will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of the Japanese technical cooperation, through the full and active involvement in the Project of all related authorities, beneficiary groups and institutions so that the technologies and knowledge acquired by the counterpart personnel through the Project should ultimately contribute to the economic and social development of the Argentine Republic.

11 Schedule of the Project

Both sides agreed on the Tentative Schedule of Implementation for the Project as shown in ANNEX 11.

Furthermore, both sides drafted the Plan of Operations (hereinafter referred to as "PO") and Annual Plan of Operations (hereinafter referred to as "APO") for the Japanese fiscal year 2001 for the

Project as shown in ANNEXES 12 and 13, respectively.

The PO and APO are regarded as tentative and should be discussed further between the Japanese experts and the Argentine side after the Project starts.

12 Project Cycle Management

(1) Application of Project Cycle Management Method

Both sides reconfirmed that project planning, monitoring and evaluating method entitled Project Cycle Management (hereinafter referred to as "PCM") will be applied to the Project to monitor and evaluate the level of the achievement and enhance the communication for its smooth implementation.

(2) Project Design Matrix

Both sides reconfirmed that the Project Design Matrix (hereinafter referred to as "PDM") ought to be designed at the planning stage of the Project, as a framework clarifying the multi-level chain of cause-to-effect such as input to output, output to project purpose, and project purpose to overall goal.

Then, both sides agreed on the draft of PDM as shown in ANNEX 14 and reconfirmed the following:

a. After necessary revision, the first version of PDM will be finalized and attached to the Minutes of Discussions of Implementation Study Team.
b. The Coordinators and the Japanese experts should examine the indicators in the planning stage of the Project, which is scheduled in the first year of the cooperation period, so that indicators and/or targets for project purpose and outputs should be as objectively verifiable as possible.
c. PDM should continue to be reviewed and revised if necessary, with further discussion between both sides.

(3) Monitoring

The Team explained and the Argentine side agreed the following:

a. Based on PDM, regular monitoring on the achievement of the Project should be implemented primarily by the Coordinators and the Japanese experts, in order to grasp the progress and the achievement of the Project and to modify the plan and take necessary actions for smooth implementation.
b. Within the first 6 months after the commencement of the Project, the Coordinators and the Japanese experts should establish the monitoring plan and system which is drafted in ANNEX 15, and thereafter, monitoring should be done and the result should be distributed to the organizations and/or personnel concerned with the Project.

(4) Evaluation

The Team explained and the Argentine side agreed the following:

a. Evaluation of the Project is to be conducted, based on the five basic evaluation components as

shown in ANNEX 16.

b. The midterm evaluation will be conducted jointly by both sides in the middle of the cooperation period, in order to examine the achievement of the Project and modify the plan if necessary.

c. The final evaluation of the Project will be conducted jointly by both sides, approximately 6 months before the termination of the cooperation period, in order to examine the achievement of the Project.

13 Joint Coordinating Committee of the Project

For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in ANNEX 17.

14 Common Language

Both sides confirmed that the common language used in any activities of the Project should be English.

15 Project Document

The Team showed the Argentine side the draft of the Project Document, which is drafted with information gathered in the first and second preparatory studies, and made some questions to collect some more information necessary to complete the draft. The Team explained to the Argentine side that the final draft of the Project Document would be completed by the beginning of December and given to the Argentine side through JICA Argentine Office before the Implementation Study Team is dispatched.

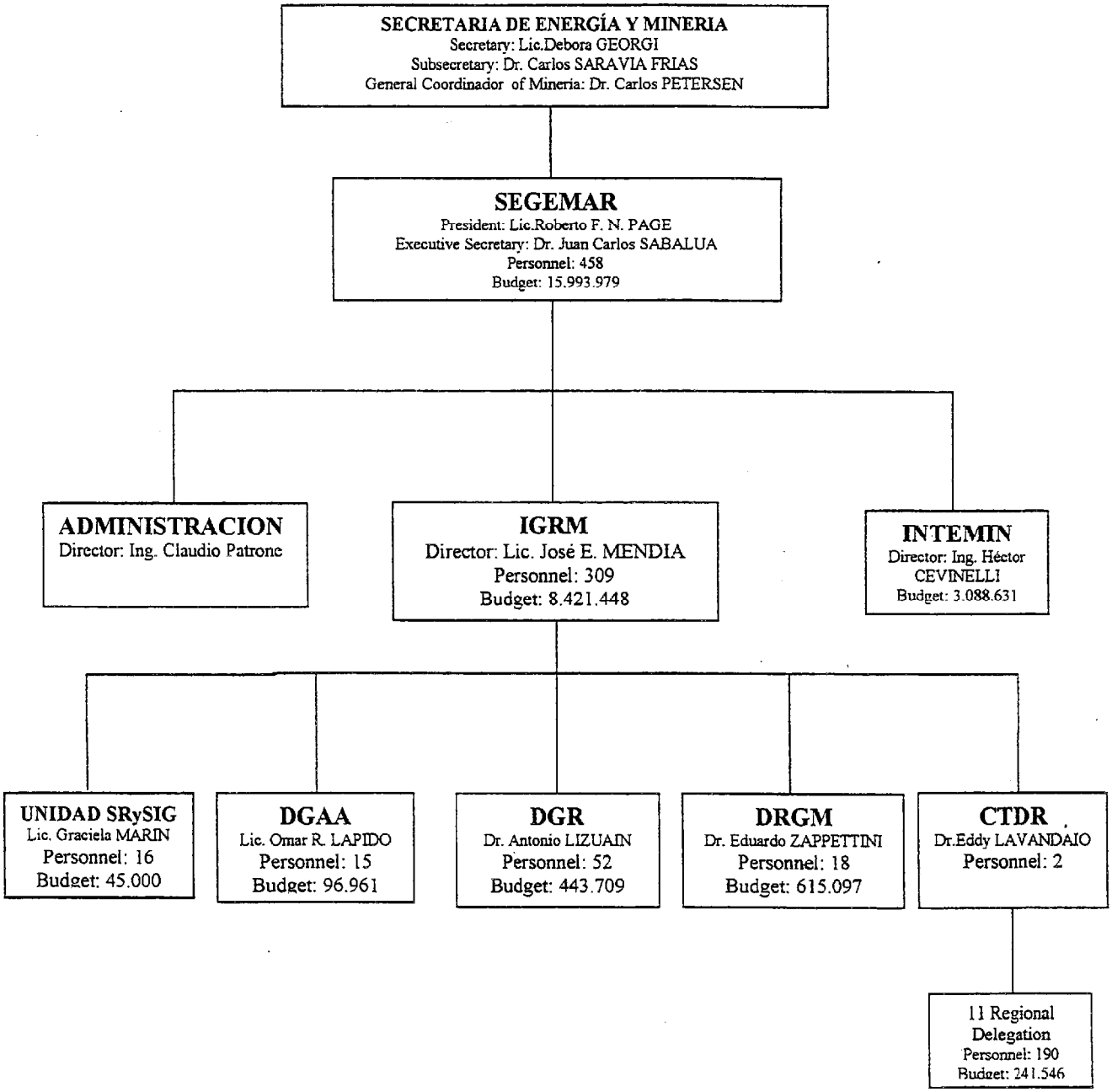
16 Others

(1) Both sides agreed that the items mentioned above 1 to 16 are still provisional and will be discussed further with other necessary things to be finalized when the Implementation Study Team is dispatched.

(2) The list of attendants at the meetings is as shown in ANNEX 18.

LIST OF ANNEXES

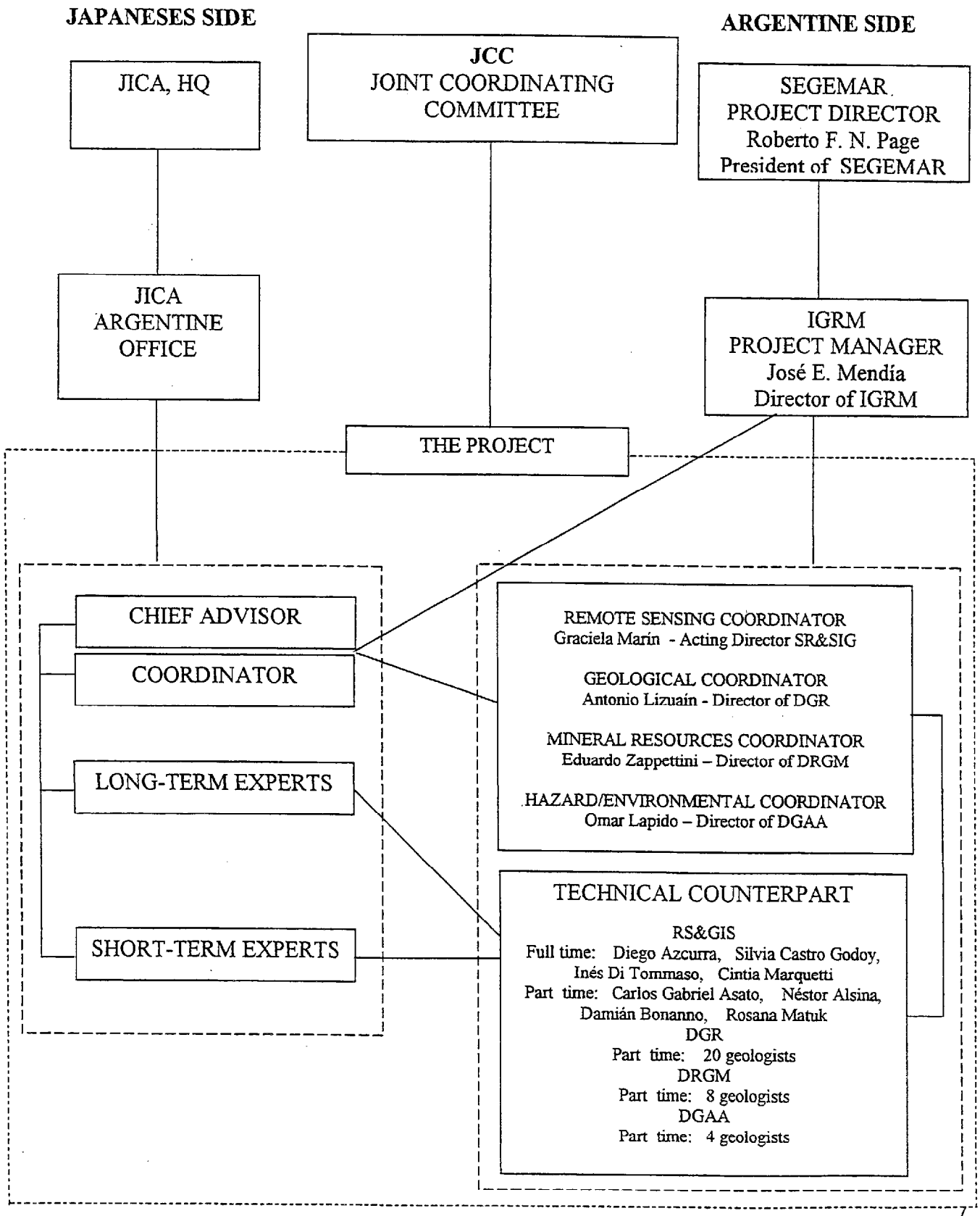
ORGANIZATION , 2000 BUDGET AND STAFF

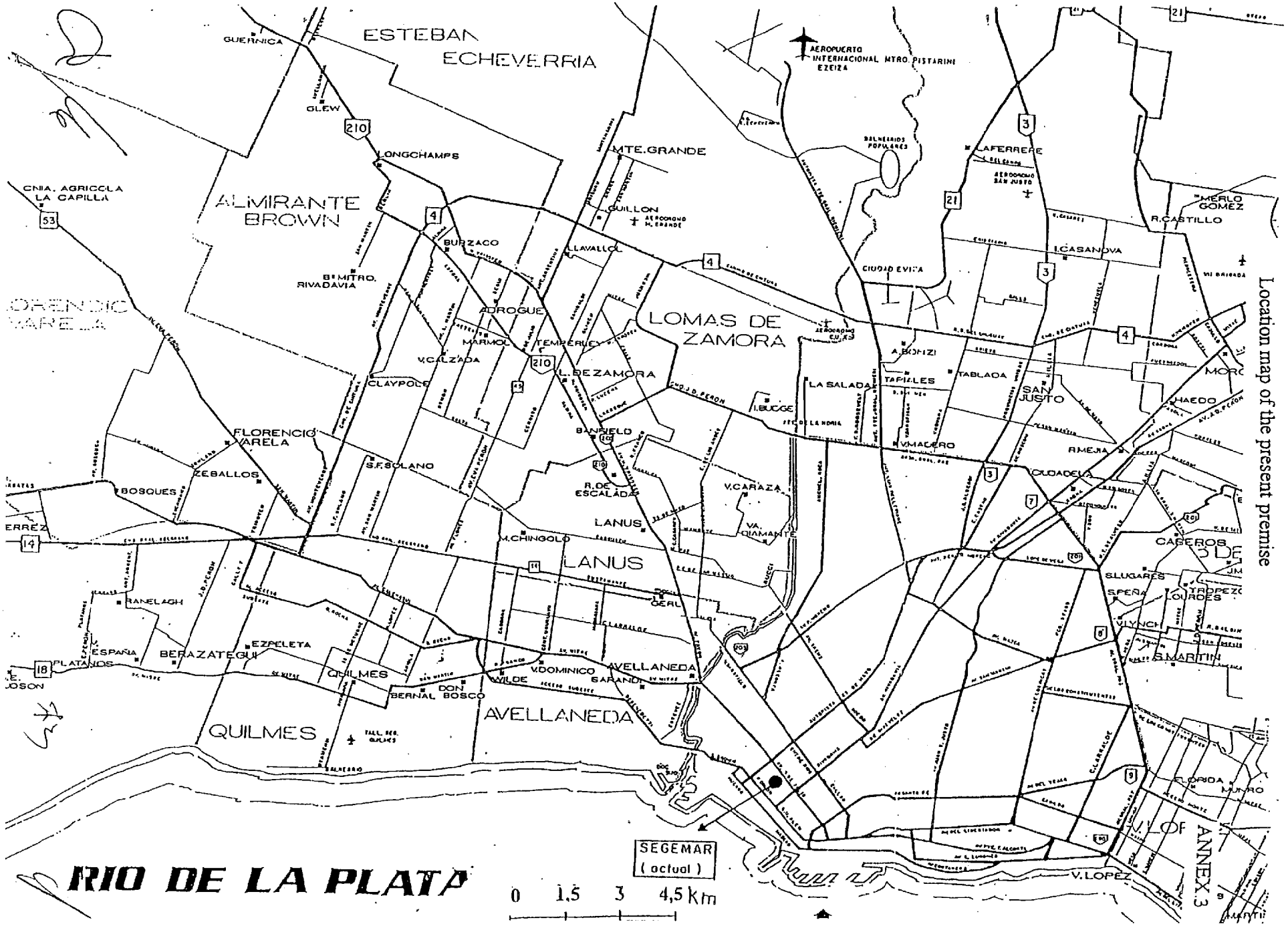


SEGEMAR – Servicio Geológico Minero Argentino
IGRM – Instituto de Geología y Recursos Minerales
INTEMIN – Instituto de Tecnología Minera
DGAA – Dirección de Geología Ambiental y Aplicada
DGR – Dirección de Geología Regional
DRGM – Dirección de Recursos Geológico-Mineros
UNIDAD SRySIG – Unidad de Sensores Remotos y Sistemas de Información Geológica
CTDR – Coordinación Técnica de Delegaciones Regionales

ANNEX 2

REGIONAL GEOLOGIC MAPPING WITH ADVANCED SATELLITE DATA IN THE ARGENTINE REPUBLIC





Location map of the present premise

ANNEX 4

Details of the fields of technology transfer

I. Data handling and fundamental concept of earth resources satellite data

1. Introduction to new hardware and software

    a. Hardware management

    b. Software handling (remote sensing, GIS, others)

    c. Data management (raw data, image products)

2. Basic concept of remote sensing and its application to geological use

    a. Visible and near-infrared (VNIR), and short-wave infrared (SWIR) sensing

    b. Thermal infrared (TIR) sensing

    c. Stereoscopic image and digital elevation model (DEM)

    d. Microwave sensing

    e. Satellite platform, orbit, data acquisition

    f. Case studies of geological mapping based on various remote sensing data

3. Effective use of ASTER data from pre-launch studies

II. Digital image processing and thematic mapping of alteration minerals and lithology with silica content by ASTER data

1. Pre-processing (data loading, line replacing, geometric correction, mosaicking)

2. Image enhancement (stretching, filtering, statistical treatment, fast Fourier transform, others)

3. SWIR analysis

    a. Methodology to obtain apparent reflectance

    b. Construction and management of spectral library

    c. Methodology of mapping alteration minerals (binary encoding, spectral angle mapping, matched filtering, spectral unmixing, others)

4. TIR analysis

a. Separation of emissivity from temperature

b. Silica abundance estimation based on emissivity spectra

III. Application of ASTER data to geological mapping and mineral resources exploration

1. Alteration mineral mapping based on SWIR data

a. Three-dimensional interpretation of common hydrothermal systems

b. Geological interpretation based on SWIR mapping results

d. Field verification for improving mapping quality

e. Operation of spectrometer and data acquisition of reflectance spectra in the field

2. Lithologic mapping by TIR data

a. Extraction of silica-introduced portion in hydrothermal systems

b. Lithologic interpretation based on emissivity spectra

c. Field verification for improving mapping quality

d. Operation of radiometer and data acquisition of field emissivity spectra

3. Application of DEM data to geology

a. Data handling and analytical method

b. Geological analysis by DEM

4. Integration of remote sensing analysis and geological field survey

a. Comprehensive analysis of VNIR/SWIR/TIR mapping results

b. Integrated Interpretation of geology and mineral resources (mineral potential analysis)

IV. Microwave analysis using PALSAR data

1. Data handling and image processing (data loading, noise mitigation, correction of distortion, mosaicking, others)

2. Land use analysis (forest analysis) by radar polarimetry

3. Topographic analysis by radar interferometry

V. Introduction to environmental analysis using ASTER and/or PALSAR data

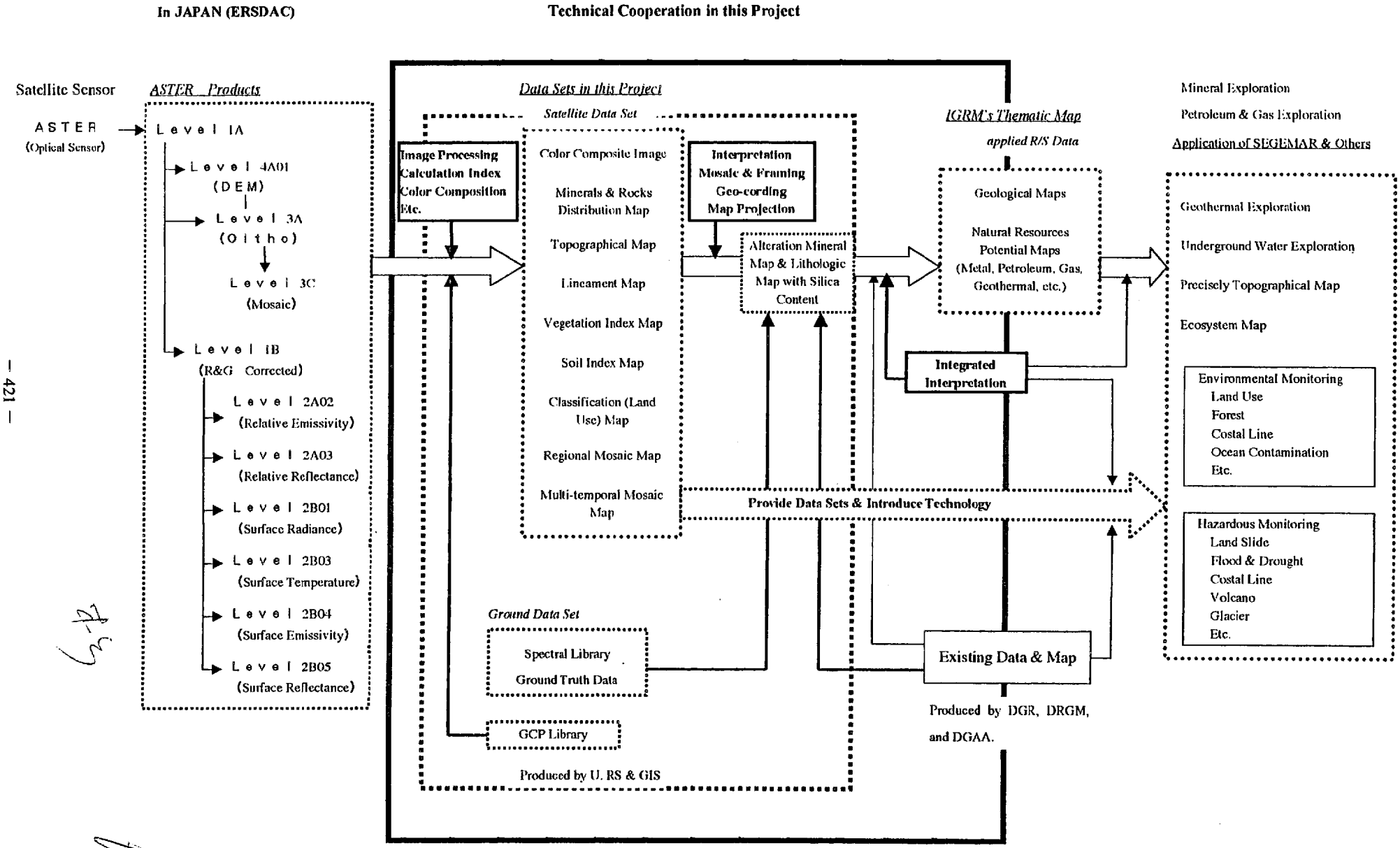
1. Land use analysis (provisional)
2. Vegetation index analysis (provisional)
3. Soil index analysis (provisional)

VI. Introduction to hazardous area analysis using ASTER and/or PALSAR data

1. Flood level observation (provisional)
2. Coastal line monitoring (provisional)
3. Drought monitoring (provisional)
4. Volcano monitoring (provisional)
5. Land slide monitoring (provisional)

VII. Introduction to hyperspectral data analysis

Concept on Flow of Products and Their Application in the Project



Equipment necessary for technology transfer in the Project

Category A

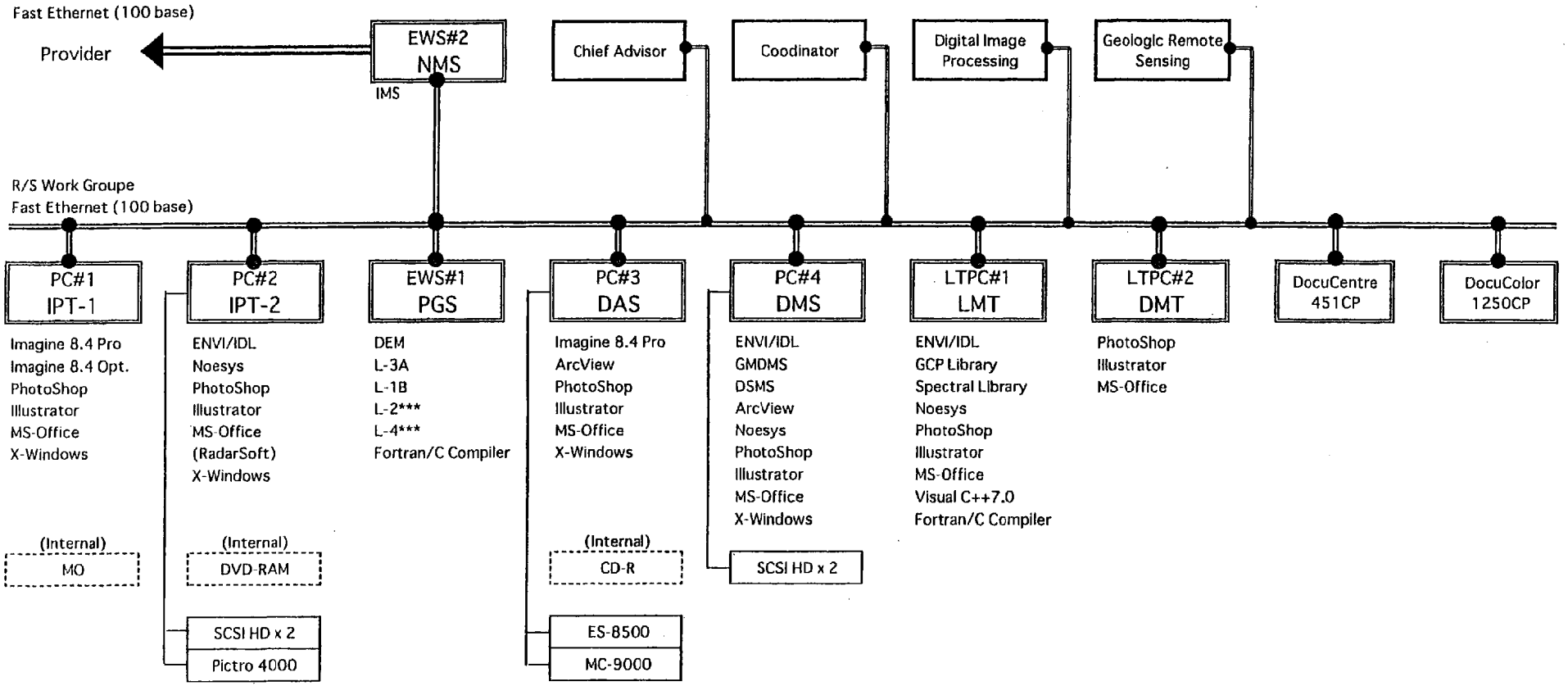
R/S Processing System

	Quantity	Specification			
Hardware					
EWS					
	1	4 CPU	450 MHz<	4 MB< Cache	SUN Ultra 80 Model 4450
		4 GB< RAM			
		Internal HDD	18 GB SCSI x 2		
		External HDD	18 GB SCSI x 12, RAID Array		SUN StorEdge A1000
		Graphics Board	Expert3D		
		21"CRT			
		8mm Tape Drive	(External)		
		12-24GB 4mm DDS-3 Tape Drive(internal)			
		CD-ROM	(Internal)	32x speed	
		DVD-ROM	(Internal)		
		100M Fast Ethernet			
		Keyboard			
		Mouse			
		CoProcessor			SunPCi
		OS			Solaris 7
		with Accessories			
		with Support			Silver Support
NETWORK					
Server	1	Sun Enterprise 220R A34-ULD1-512MFA1			
		12-24GB 4mm DDS-3 Tape Drive(internal)			
		with Setup			
		with Accessories			
Desktop PC					
	4	2 CPU	933 MHz<		HP Kayak XU800
		FSB	133 MHz<		
		512 MB< RAM			
		Internal HDD	18 GB SCSI x 2		
		Graphics Board			
		Video Memory	64 MB<		
		100Base-TX Lan Adapter			
		CD-ROM	48x speed		
		21"CRT			
		OS	Windows NT Workstation 4.0+SP6		
		Keyboard			
		Mouse			
		with Accessories			
		CPU Stand			
Desktop					
Accessories	1	CD-RAM Drive	(Internal)		
	1	DVD-RAM Drive	(Internal)		
	1	MO Drive	(Internal)		
	4	SCSI 18G HD	(External)		
FujiXerox	1	Network Printer			DocuCentre 451CP
FujiXerox	1	Network Color Printer & Scaner			DocuColor 1250CP

FujiXerox	1		+ Document Gate 2
Fuji Film	1	Color Photo Printer	Pictrogrphy 4000 120MB Pictro Rip
EPSON	1	Image Scaner	EPSON ES-8500
EPSON	1	InkJet Color Plotter	EPSON MC-9000SR
Note PC			
	2	1 CPU Movile Pentium III 850MHz< 128 MB RAM Internal HDD 30GB< 100Base-TX Lan Card USB Mouse USB Hub	SONY VAIO XR100F/K
Power Supply			
	2	Uninterruptable 1KVA, 10minutes Backup	
Software			
ENVI/IDL	3	Ver.3.2+SP2	Image processing
Noesis	3	Ver.2.0	HDF Viewer
ERDAS	2	Imagene 8.4 professional	PC Version
ERDAS	1	Imagine 8.4 OrthoRadar	PC Version, for SAR
	1	Imagine 8.4 StereoSAR	PC Version, for SAR
	1	Imagine 8.4 IFSAR	PC Version, for SAR
(	1	Imagine 8.4 Vector	PC Version)
(	1	Imagine 8.4 VirtualGIS	PC Version)
(	1	Imagine 8.4 OlthoBASE	PC Version)
(	1	Imagine 8.4 ATCOR2	PC Version)
PCI	1	RadarSoft (Atlantis)	PC Version, for SAR
ArcView	2	Ver.3.2	GIS Viewer
	2	Image Analyst	GIS Viewer Tool
	2	Spatial Analyst	GIS Viewer Tool
Humming Bird	6	Exceed 7.0	X-Windows Emulator
Adobe	6	Photoshop 6.0	
	6	Illustlator 9.0	
Symantec	6	System Works 2000	
Micro Soft	6	Office 2000 Pro	
	1	Visual C++7.0	
Lahey	1	Fortran/C Compiler	
Sun	1	Forte C++ Personal Edition	Solaris Version
	1	Forte Fortran Desktop Edition	Solaris Version
ERSDAC	1	DEM Processor	EWS
	1	L-3A Processor	EWS
	1	L-1B Processor	EWS
	1	GMDMS	PC
	1	DSMS	PC
	1	IMS	EWS
	1	Spectral Library	PC
	1	GCP Library	PC

Plan for network of this R/S processing system is shown in the next page.

R/S Work Group System



NMS	Network Management System (Network Server)
PGS	Products Generating System (Data Server)
IPT	Image Processing Terminal
DAS	Data Analyzing System
DMS	Data Management System
LMT	Library Management Terminal
DMT	Document Management Terminal

	Internal HTTP Server GIS Data Server
1	SUN Enterprise 250, 400 Mb RAM, 18Mb HD MAIN ARC/INFO Aplication and Development System. Arc/Info Map Production Server. Arc/Info Digitizing Server. 3 Arc/Info Licenses Internal HTTP Server GIS Data Server
1	ACER ALTOS 9000 COMPUTER Pentium PRO 256 Mb RAM, LINUX RED HAT OS 6.1, 4 Gb SCSI HD. MAIN FILE SERVER
1	PLOTTER A0 HP 755CM 74 Mb RAM Postscript printer Network supported

3. Others

Quantity	Description
1	COMPUTADORA PENTIUM DELL OptiPlex Pentium 200 64 Mb RAM, 1Gb SCSI HD Development and Data Administration platform with Arc/Info EWS, X Windows emulator, Arc/View 3.2.
1	PENTIUM COMPUTER DELL OptiPlex Pentium 200, 32 Mb, 1Gb SCSI HD. Administrative Computer. Windows NT 4 p3. Arc-View 3.1 (Graciela Marin computer)

Shareable Equipment

Quantity	Description
1	PLOTTER A0 HP 755CM 74 Mb RAM Postscript printer Network supported
1	LASER PRINTER HP 5M 8 Mb RAM Postscript printer Network supported
1	A0 SCSI Scanner B/W 800 dpi max.
1	PENTIUM COMPUTER ACER ALTOS 300 Pentium 200, 32 Mb, 1Gb SCSI HD. LINUX RED HAT 6.1 OS UNIX Aplication Development Server

Equipment for Field Survey

Item		Number
1	Field Portable Spectroradiometer	
	GER3700 Main Body, Tripod, Standard Battery Power Supply Cable, Battery Charger Cable AC Power Supply Cable, Manual	1
	PC(for data processing)	1
	Reflection Diffuser Plate	1
2	FT-IR Spectrometer	
	Model 102 Main Body, Tripod, Standard Battery Battery Checker, Power Suply Cable Battery Charger Cable 0.4 litter liquid nitrogen dewar-bottle Diffuse gold plate, Manual	1
3	GPS	
	GeoExplorer III (39100-00-ENG) (Trimble) External Power Kit External Antenna Kit RTCM/NMEA Data Splitter Cable	4
	Hard Carrying Case	4
	PC(for data processing)	2
	1 Yr Extended Warranty (hardware)	4

Category B

REMOTE SENSING AREA

Quantity	Description
2	PENTIUM COMPUTER DELL OptiPlex Pentium II 64 Mb RAM, 4 Gb SCSI HD Image Processing Platform PCI, ER-Mapper 5.2
1	KAYAK COMPUTER XM600 7/800 Pentium III 800 Mhz 256 Mb RAM, 9 Gb SCSI HD Image Processing Platform ERDAS Imagine 8.4 (NT)

GIS AREA

1. Digitizing and Edition Component

Quantity	Description
1	PENTIUM COMPUTER ACER 5200 Pentium 200 64 Mb 2Gb SCSI HD Windows NT 4 p3. ArcView 3.1. Microstation. X Windows Server Digitizer platform with Arc-Info EWS and Microstation. Attched scanning system (A0 Scanner connected)
2	PENTIUM COMPUTER DELL OptiPlex Pentium 200 32 Mb RAM, 1Gb SCSI HD Digitizing platform with Arc/Info NT
1	PENTIUM COMPUTER DELL OptiPlex Pentium 200 32 Mb RAM, 1Gb SCSI HD X Windows Digitizing platform width LINUX RED HAT 6.1
1	COMPAQ COMPUTER DESK PRO EP Pentium III 650 Mhz 256 Mb RAM 18 Gb SCSI HD X Windows Digitizing platform width LINUX RED HAT 6.1
3	DIGITIZER TABLE SUMAGRAPHICS IV

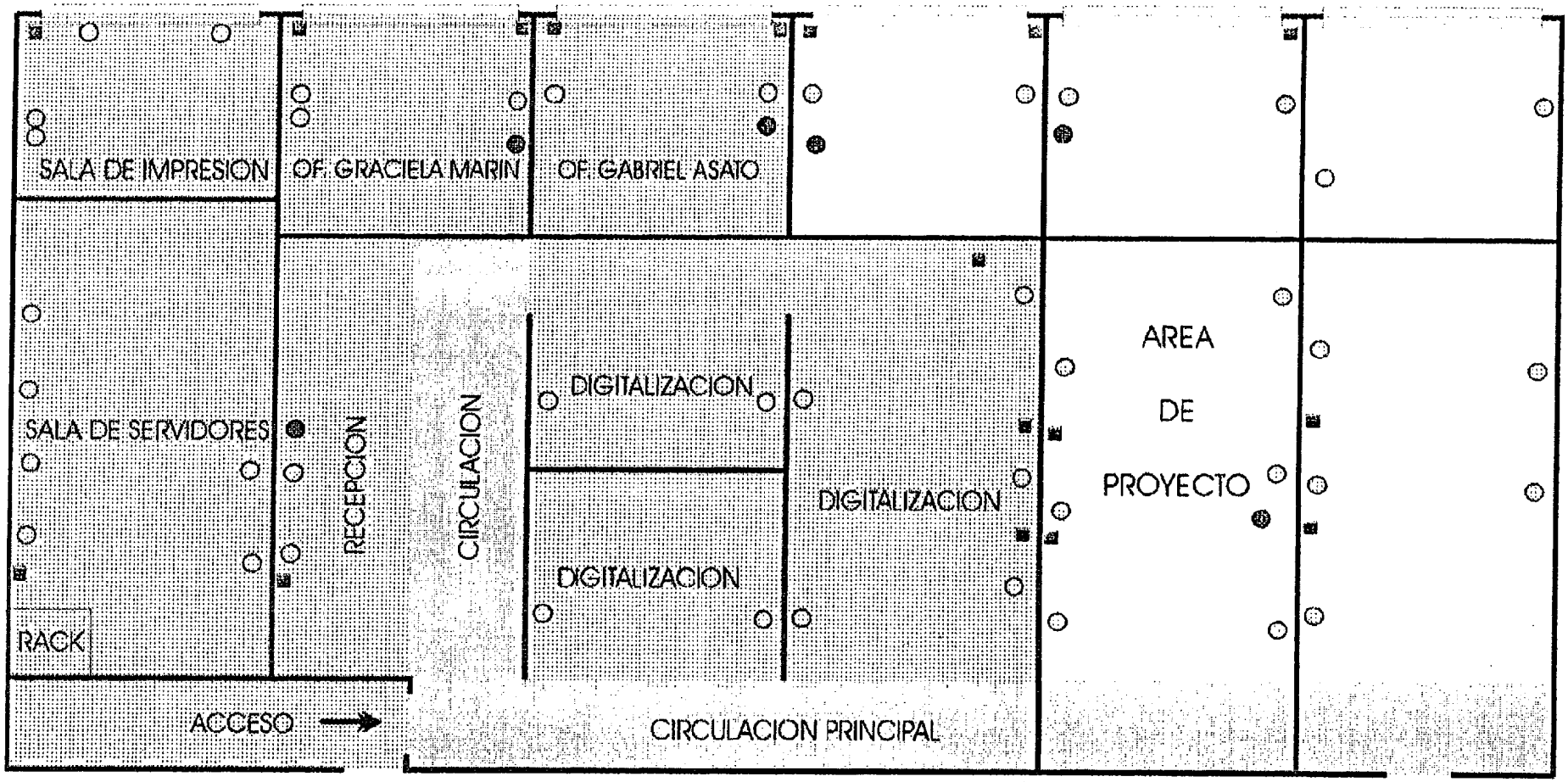
2. Server System

Quantity	Description
1	SUN Sparcstation 20, 128 Mb RAM, 8Mb HD MAIN ARC/INFO Aplication and Development System. Arc/Info Map Production Server. Arc/Info Digitizing Server. 3 Arc/Info Licenses

	FGDC Metadata Server Internal HTTP Server
1	Five 2x CDROM SCSI Tower, width HP 4x CD ROM recorder
1	HEXABYTE 870 LT (under UNIX)
When necessity arises	Equipment for Workshops and Seminars (copy machine, LCD projector etc.)

FOR FIELD SURVEY

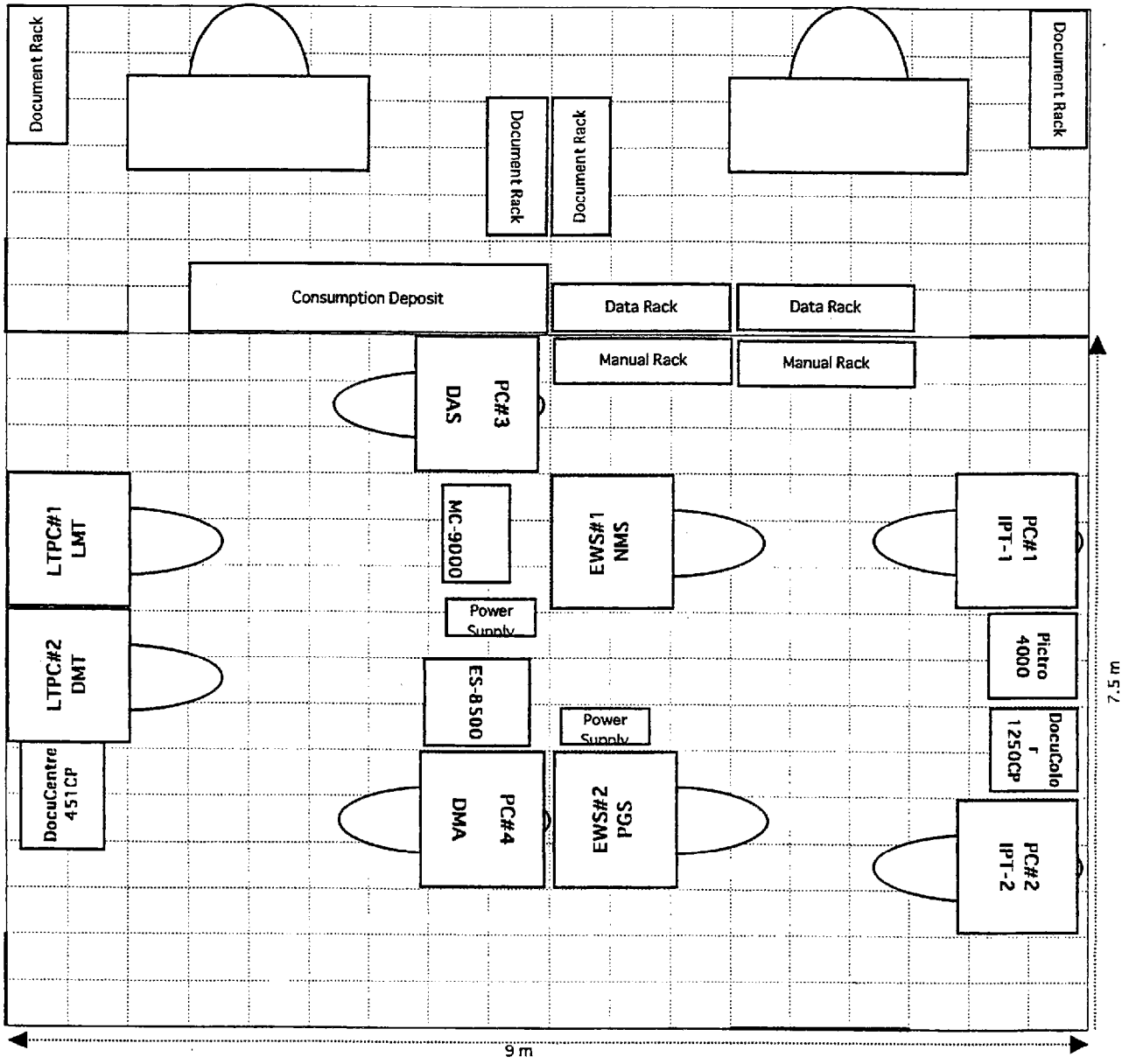
When necessity arises	Vehicles
When necessity arises	Equipments for field survey (rock hammer, portable-GPS etc.



- Puestos de trabajo red interna SR y SIG.
- Puestos de trabajo red externa.
- Red telefónica alternativa.

Unidad Sensores Remotos y SIG
Piso 8 sectores 30, 1, 2, 3 y 4.

Provisional layout of necessary facilities and equipment



ANNEX 9

List of full-time and part-time counterpart

1. Coordinators

Name	Position
Graciela Marín	Acting Director of the RS&GIS Division
Antonio Lizuain	Director of Regional Geology Direction (DGR)
Eduardo Zappettini	Director of Geological and Mining Resources Direction (DRGM)
Omar R. Lapido	Director of Environmental and Applied Geology Direction

2. RS and GIS Division Staff

	Present Activity	Project Activity
Carlos Gabriel Asato - Geologist, specialized in RS and GIS (1991).	Corporate GIS administrator, GIS and integration data projects developer.	GIS Administrator, GIS developer, RS process participation.
RS Project Staff – Full Time (provisional)		
Inés Di Tommaso – Geologist (1979) and GIS operator (1996).	GIS digitizer.	RS process and interpretation.
Silvia Castro Godoy – Geologist (1993) and GIS operator (1996).	GIS digitizer.	RS process and interpretation.
Diego Azcurra – Geologist (2000) specialized in RS (1997).	RS processing.	RS process and interpretation.
Cintia Marquetti – Geologist 2000).	RS processing.	RS process and interpretation.
RS Project Staff – Part Time		
Rosana Isabel Matuk Herrera – Computer Analyst (2000).	RS&GIS network administrator	RS&GIS network administrator.
Nestor Alsina – Mathematician (1977), specialized in RS and GIS.	RS processing.	RS process participation.
Damian Bonnano – Technician (1998) in RS (1999).	RS processing.	RS process participation.
GIS Staff		
Jorge Romano – Geologist (1992) specialized in computer systems.	Arc/Info programming. Digital map production administrator.	
Silvia Chavez – Geologist (2000) and GIS operator (1996).	GIS digitizer.	
Veronica Molina – Math-Topographic Technician (1992) and GIS operator (1996).	GIS digitizer.	
Norberto Gabriel Candaosa - Math-Topographic Technician (1997) and GIS operator (1997).	GIS digitizer.	
María Liliana Gambandé Alvarez – Geographer (1994) and GIS operator (1998).	GIS digitizer.	
Ana Felisa Tavitian Serrano - Math-Topographic Technician (1994) and GIS operator (1996).	GIS digitizer.	
María Isabel Olmos – Geographer (1990) and GIS operator.	GIS digitizer.	

3. Part-time counterpart from other sections

Sections	No of staff
Regional Geology Direction (DGR)	20 geologists
Geological and Mining Resources Direction (DRGM)	8 geologists
Environmental and Applied Geology Direction (DGAA)	4 geologists

BUDGETARY PLAN OF THE COST NECESSARY FOR OPERATION OF THE PROJECT WHICH IS TO BE BORNE BY THE ARGENTINE SIDE

Item Description	Budget 2001	Budget 2002	Budget 2003	Budget 2004	Budget 2005 (Jan-Mar/00)	
Software maintenance / up grade	8000	8000	12000	12000	2000	
Hardware maintenance	7000	7000	8500	8500	500	
Consumables (paper, ink, toner, CD, other)	5000	5000	6500	6500	500	
ASTER data delivery (transportation, and consumables from Japan to Argentina)	5000	5000	5000	5000	1000	
Air tickets / transportation	4000	4000	4000	4000	1000	
Field Allowances	56000	56000	62000	62000	5000	
Field Operative Costs (assistants, oil, truck maintenance, library, photography, others)	15500	15500	15500	15500	2000	
Samples Chemical Analyzes		4000	5600	5600	1500	
K-AR / U-PBS Age Determination		10000	14000	14000	3000	
Petrography Slide Sections		3800	5200	5200	1500	
Seminar/Workshop	2000	2000	2000	2000		
Part time Data Entry	5000	7200	7200	7200	2000	
Total:	**107500**	**127500**	**147500**	**147500**	**20000**	**550000**

Remarks:

- **Geological and metalogenetic maps**: During the project, 4 geological maps (1:100.000) and 1 metalogenetic map (1:250.000) will start by year. Eighteen (18) months will be necessary to finish each one, so at the end of the project, 8 geological and 2 metalogenetic maps will be finished; also 4 geological and 1 metalogenetic maps will be started.

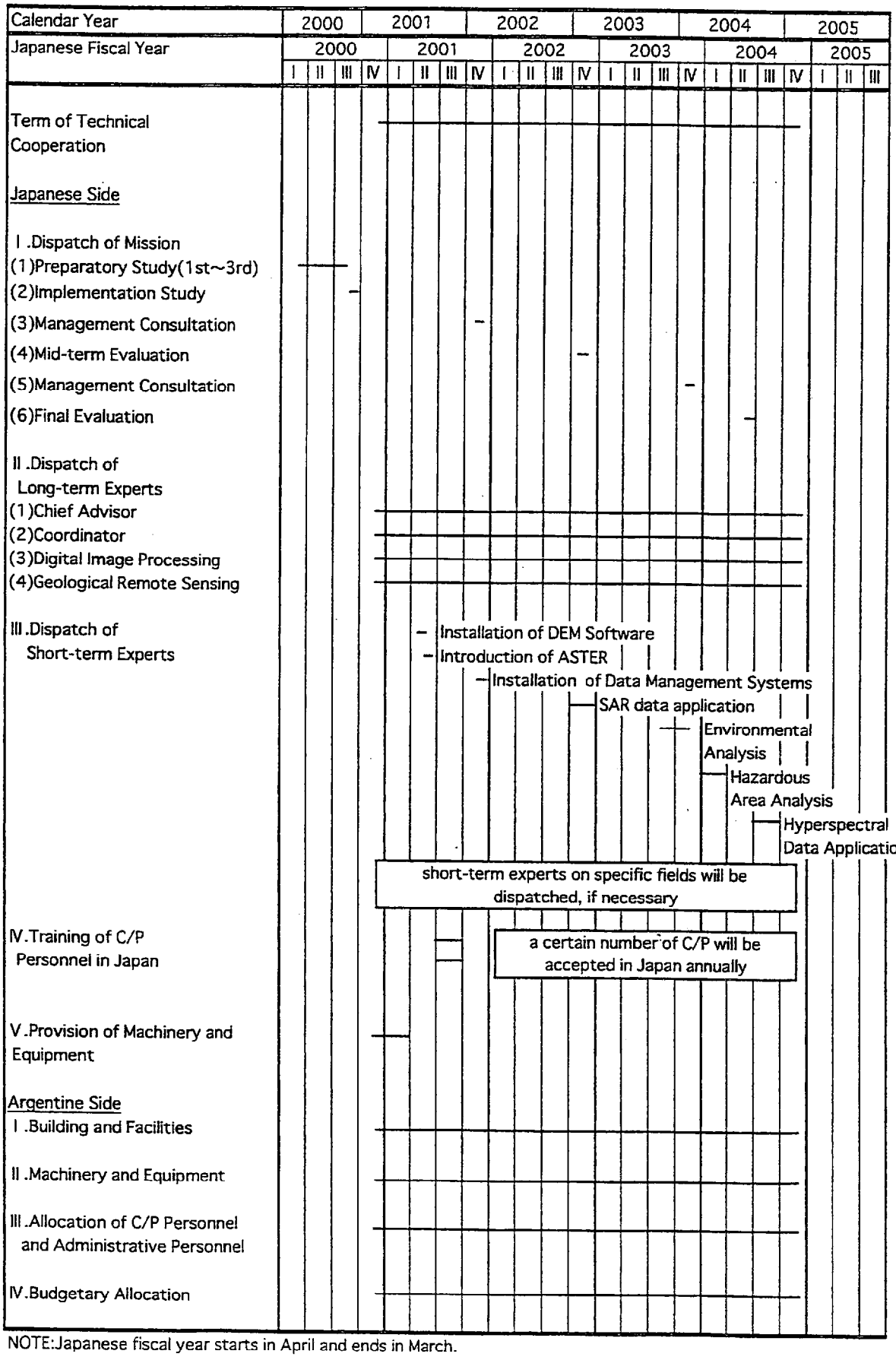
- **X-ray analysis**: The X-ray analysis will be done in the laboratories of INTEMIN.

- **Vehicles**: The vehicles of SEGEMAR will be used for field survey. It should be necessary to request them 6 months before the scheduled use. Nevertheless extraordinary needs will be attended according to the circumstances.

- **Seminars**: Four seminar(s)/workshop(s) by year will be developed in order to show the new technology to all the professionals into SEGEMAR, universities, national and provincial organizations, companies and consultants. Two of the seminar(s)/workshop(s) will be held in Buenos Aires, and the other two will be held in the Provinces.

Tentative Schedule of Implementation (TSI)

ANNEX 11



NOTE:Japanese fiscal year starts in April and ends in March.

Plan of Operations for the whole period

2000.11.7

OUTPUT	ACTIVITY	TARGET	Calendar Year / JFY	2000	2001				2002				2003				2004					In charge		REMARKS
				IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	Japan	Argentina	
A1. Technology transfer system is establish	1-1 Allocate staff as planned																					CA	P/H	
	1-2 Allocate expert as planned																					CA	P/H	
	1-3 Make the plan of operation																					CA	P/H	
	1-4 Make the budgetary plans																					CA	P/H	
	1-5 Make and implement the monitoring and evaluation plan																					CA	P/H	
	1-6 Operate the joint coordinating committee																					CA	P/H	
A2. Equipment and advanced satellite data necessary for technology transfer are operated and maintained properly	2-1 Make and implement equipment operation and maintenance plan																					Expert both	RS/GIS DRG	
	2-2 Establish and operate data management systems																					Expert Image P.	RS/GIS	
	2-3 Procure and install necessary equipment																					Expert both	RS/GIS DGR	
	2-4 Allocate budget for operation and maintenance of equipment																					CA	RS/GIS DGR	
	2-5 Instruct C/P on operation and maintenance of equipment																					Expert both	RS/GIS DGR	
A3. IGRH C/Ps are able to utilize advanced satellite data such as ASTER and/or PALSAR in order to make geological maps and thematic maps for mineral exploration.	3-1 Training for hardware and soft vware																					Expert Image P.	RS/GIS	
	3-2 Introduce interpretation examples by using ASTER simulation data																					Expert Geology	RS/GIS DGR,DGRH	
	3-3 Instruct C/P on ASTER data processing																					Expert Image P.	RS/GIS	
	3-4 Instruct C/P on utilization of ASTER DEM																					Expert Geology	RS/GIS DGR	
	3-5 Instruct C/P on alteration mapping and silica content mapping by ASTER data																					Expert Geology	RS/GIS DGR,DGRH	
	3-6 Instruct C/P on field survey for alteration mapping, silica content mapping																					Expert Geology	DGR DGRH	
	3-7 Instruct C/P on integrated geological interpretation by ASTER data																					Expert Geology	IGRH	
	3-8 Instruct C/P on PALSAR data analysis																					Short T.Expert	RS/GIS	
	3-9 Instruct C/P on Hyperspectral data analysis																					Short T.Expert	RS/GIS	
A4. Usefulness of the remote sensing data is understood by the persons concerned and users through seminars	4-1 Hold seminars and workshops																					CA	P/H	
B.3 C/Ps of DGAA understand how to utilize advanced satelite data such as ASTER and/or PALSAR in environmental or hazardous area study	1.Instruct C/P on Environmental analysis by using ASTER and/or PALSAR																					Short T.Expert	RS/GIS DGAA	
	2.Instruct C/P on Hazardous area analysis using ASTER and/or PALSAR																					Short T.Expert	RS/GIS DGAA	
	3.Instruct C/P on field survey for environmental/hazardous are study																					Short T.Expert	DGAA	

Annual Plan of Operations for the Year 2001

2000.11.7

Output	Activity	Target	2000 Mar	(JFY)2001 Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	in charge Japan	in charge Argentine	Remarks
A1. Technology transfer system is establish	1-1 Allocate staff as planned															CA	P/M	
	1-2 Allocate expert as planned															CA	P/M	
	1-3 Make the plan of operation															CA	P/M	
	1-3-1 Make the plan of operation for whole period															CA	P/M	
	1-3-2 Make the annual plan of operation for JFY 2001															CA	P/M	
	1-3-3 Make the annual plan of operation for JFY 2002															CA	P/M	
	1-4 Make the budgetary plans															CA	P/M	
	1-4-1 Make the budgetary plan for whole period															CA	P/M	
	1-4-2 Make the budgetary for JFY 2001															CA	P/M	
	1-4-3 Make the budgetary for JFY 2002															CA	P/M	
	1-5 Make and implement the monitoring and evaluation plan															CA	P/M	
	1-5-1Make the monitoring and evaluation plan															CA	P/M	
	1-5-2 Make the monitoring report of JFY 2001															CA	P/M	
	1-6 Operate the joint coordinating committee															CA	P/M	
A2. Equipment and advanced satellite data necessary for technology transfer are operated and maintained properly	2-1 Make and implement equipment operation and maintenance plan															Expert I.P.and G.	RS/GIS DGR	
	2-1-1 Make equipment management plan															CA	RS/GIS DGR	
	2-1-2 Implement equipment management plan															CA	RS/GIS DGR	
	2-2 Establish and operate data management systems															EXPERT IMAGE P.	RS/GIS	
	2-2-1 Establish of data search and DGR system for ASTER															EXPERT IMAGE P.	RS/GIS	
	2-2-2 Operation of data search and DGR system for ASTER															EXPERT IMAGE P.	RS/GIS	

Annual Plan of Operations for the Year 2001

2000.11.7

Output	Activity	Target	2000 Mar	(JFY)2001 Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	In charge Japan	In charge Argentine	Remarks
	2-2-3 Establish of data management system for ASTER															EXPERT IMAGE P.	RS/GIS	
	2-2-4 Operate of data management system for ASTER															EXPERT IMAGE P.	RS/GIS	
	2-2-5 Plan ASTER data set processing policies															EXPERT IMAGE P.	RS/GIS	
	2-2-6 Establish ASTER data set processing system															EXPERT IMAGE P.	RS/GIS	
	2-2-7 Operate of ASTER data set processing system															EXPERT IMAGE P.	RS/GIS	
	2-2-8 Establish of ASTER data set archive and distribution system															EXPERT IMAGE P.	RS/GIS	
	2-2-9 Operate ASTER data set archive and distribution system															EXPERT IMAGE P.	RS/GIS	
	2-3 Procure and Install necessary equipment															Expert I.P. and G.	RS/GIS DGR	
	2-4 Allocate budget for operation and maintenance of equipment															AC	RS/GIS DGR	
	2-4-1 Estimate cost for operation and maintenance equipment budget															AC	RS/GIS DGR	
	2-4-2 Estimate frequency of consumable supply															AC	RS/GIS DGR	
	2-4-3 Make the budget plan for equipment operation and maintenance consumable supply															AC	RS/GIS DGR	
	2-5 Instruct C/P on operation and maintenance of equipment															Expert I.P. and G.	RS/GIS DGR	
A3. IGRM C/Ps are able to utilize advanced satellite data such as ASTER and/or PALSAR in order to make geological maps and thematic maps for mineral exploration.	3-1 Training for hardware and software															EXPERT IMAGE P.	RS/GIS	
	3-1-1 Set-up for Image Processing System (H/W)															EXPERT IMAGE P.	RS/GIS	incluit OS
	3-1-2 Training for Image Processing System (H/W) Operation															EXPERT IMAGE P.	RS/GIS	incluitOS
	3-1-3 Installation of Image Processing System (S/W)															EXPERT IMAGE P.	RS/GIS	ENVI, Noesys, PhotoShop etc.
	3-1-4 Training for Image Processing System (S/W) Operation															EXPERT IMAGE P.	RS/GIS	ENVI, Noesys, PhotoShop etc.
	3-1-5 Installation of ArcView															EXPERT IMAGE P.	RS/GIS	

Annual Plan of Operations for the Year 2001

2000.11.7

Output	Activity	Target	2000	(JFY)2001												in charge		Remarks
			Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Japan	Argentine	
	3-1-6 Training for ArcView															EXPERT IMAGE P.	RS/GIS	
	3-1-7 Installation of ERDAS Imagine 8.4															EXPERT IMAGE P.	RS/GIS	
	3-1-8 Training for ERDAS Imagine 8.4															EXPERT IMAGE P.	RS/GIS	
	3-1-9 Installation of RadarSoft															EXPERT IMAGE P.	RS/GIS	JFY2003
	3-1-10 Training for RadarSoft															EXPERT IMAGE P.	RS/GIS	JFY2003
	3-1-11 Training for HyperSpector															EXPERT IMAGE P.	RS/GIS	JFY2004
	3-2 Introduce interpretation examples by using ASTER simulation data															EXPERT GEOLOGY	RS/GIS DGR,DGRM	
	3-2-1 ASTER data characteristics															EXPERT GEOLOGY	RS/GIS DGR,DGRM	
	3-2-2 An example of mineral discrimination technique															EXPERT GEOLOGY	RS/GIS DGR,DGRM	
	3-2-3 Spectral characteristics of alteration mineral of Porphyry Copper Deposits															EXPERT GEOLOGY	RS/GIS DGR,DGRM	
	3-2-4 Spectral characteristics of other deposits															EXPERT GEOLOGY	RS/GIS DGR,DGRM	
	3-3 Instruct C/P on ASTER data processing															EXPERT IMAGE P.	RS/GIS	
	3-3-1 Understanding of ASTER specification															EXPERT IMAGE P.	RS/GIS	
	3-3-2 Understanding of ASTER Format															EXPERT IMAGE P.	RS/GIS	
	3-3-3 Reformatting ASTER data															EXPERT IMAGE P.	RS/GIS	Radiometric & Geometric
	3-3-4 ASTER bands operation															EXPERT IMAGE P.	RS/GIS	
	3-3-5 ASTER DEM processing															EXPERT IMAGE P.	RS/GIS	
	3-3-6 ASTER L-3A processing															EXPERT IMAGE P.	RS/GIS	JFY2002
	3-3-7 ASTER L-2 processing															EXPERT IMAGE P.	RS/GIS	JFY2002

Annual Plan of Operations for the Year 2001

2000.11.7

Output	Activity	Target	2000	(JFY)2001												In charge		Remarks
			Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Japan	Argentine	
	3-3-8 ASTER L-4 processing															EXPERT IMAGE P.	RS/GIS	JFY2002
	3-3-9 ASTER L-3C processing															EXPERT IMAGE P.	RS/GIS	JFY2002
	3-3-10 Mosaicing and framing for ASTER data															EXPERT IMAGE P.	RS/GIS	JFY2002
	3-3-11 Mosaicing and framing for ASTER data set															EXPERT IMAGE P.	RS/GIS	JFY2003
	3-3-12 ASTER data set processing for GIS															EXPERT IMAGE P.	RS/GIS	JFY2003
	3-4 Instruct C/P on utilization of ASTER DEM															EXPERT GEOLOGY	DGR	JFY2002
	3-5 Instruct C/P on alteration mapping and silica content mapping by ASTER data															EXPERT GEOLOGY	DGR	
	3-5-1 Spectral characteristics of altered minerals															SHORT-T.EXPERT	DGR	
	3-5-2 Prediction algorithm for altered minerals and silica contents															SHORT-T.EXPERT	DGR	
	3-5-3 Discrimination technique by ASTER data															SHORT-T.EXPERT	DGR	
	3-6 Instruct C/P on field survey for alteration mapping, silica content mapping															EXPERT GEOLOGY	DGR,DGRM	
	3-6-1 Portable spectrometer training															SHORT-T.EXPERT	DGR,DGRM	
	3-6-2 Field data archive															SHORT-T.EXPERT	DGR,DGRM	
	3-7 Instruct C/P on integrated geological interpretation by ASTER data															EXPERT GEOLOGY	IGRM	JFY2003
	3-8 Instruct C/P on PALSAR data analysis															SHORT-T.EXPERT	RS/GIS IGRM	JFY2003
	3-9 Instruct C/P on Hyperspectral data analysis															SHORT-T.EXPERT	RS/GIS IGRM	JFY2003
A4. Usefulness of the remote sensing data is understood by the persons concerned and users through seminars	4-1 Hold seminars and workshops															CA	P/M	
B.3 C/Ps of DGAA understand how to utilize advanced satellite data such as ASTER and/or PALSAR in environmental or hazardous area study	1. Instruct C/P on Environmental analysis by using ASTER and/or PALSAR															Short T.Expert	RS/GIS DGAA	
	2.Instruct C/P on Hazardous area analysis by using ASTER and/or PALSAR															Short T.Expert	RS/GIS DGAA	
	3. Instruct C/P on field survey for environmental/hazardous area study															Short T.Expert	DGAA	

Project Design Matrix (Ver. 1)

2000.11.7

Project Name: Regional Geologic Mapping with Advanced Satellite Data in the Argentine Republic
Duration of the Project : From March 1, 2001 to February 28, 2005
Prepared by : both sides after discussion based on the draft by the Japanese side

Implementing Agency :
-Argentine side : Argentine Geological and Mining Survey (SEGEMAR)
-Japanese side : Japan International Cooperation Agency (JICA)

Target Area : the whole country of the Argentine Republic
Target Group : Geologists who are engaged in thematic mapping with remote sensing in SEGEMAR

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
(Super Goal A) Geological maps and thematic maps prepared by IGRM are utilized by mining investors in Argentine.			
(Overall Goal A) Geological maps and thematic maps for mineral exploration using advanced satellite data are prepared by IGRM.	1. The area covered with the thematic maps is expanded. 2. The sort of the thematic map increases. 3. Users (other government organizations and private companies) are able to access the thematic maps easily.	1. Number of the thematic maps made 2. Sort of the thematic maps made 3. Questionnaires to the users	a. Prices of metals don't decrease drastically. b. Administrative measures necessary for promoting mining investments (e.g. improvement of mining rights management system) are carried out.
(Project Purpose A) IGRM is able to utilize advanced satellite data such as ASTER and/or PALSAR in order to make geological maps and thematic maps for mineral exploration.	1. Alteration mineral maps and lithologic maps with silica content of quality are made.	1-1. Evaluation by Japanese experts 1-2. Evaluation by Evaluation Committee 1-3. Questionnaire to the users	a. Personnel and budget are allocated to continue operations for thematic mapping after the Project ends. b. System for distributing the thematic maps is established.
(Output A) 1. Technology transfer system is established. 2. Equipment and advanced satellite data necessary for technology transfer are operated and maintained properly. 3. C/Ps are able to utilize advanced satellite data such as ASTER and/or PALSAR in order to make geological maps and thematic maps for mineral exploration. 4. Usefulness of the remote sensing data is understood by the persons concerned and users through seminars and workshops.	1-1. Enough C/Ps of adequate qualification are allocated. 1-2. Enough experts of adequate qualification are allocated. 1-3. Enough budget is allocated and disbursed properly. 2-1. Operation and maintenance plan for equipment and satellite data is made and implemented. 2-2. Enough budget for operating and maintaining the equipment and the satellite data is allocated and disbursed. 2-3. Enough knowledge on operating and maintaining the equipment is acquired by the C/Ps. 3. I~IV, VII of the fields of technology transfer are acquired by the C/Ps concerned.. 4-1. Many persons concerned and users attend seminars and workshops. 4-2. Usefulness of the remote sensing data is understood by the attendants of the seminars and workshops.	1. Record of inputs 2-1. Operation and maintenance plan for equipment 2-2. Budget plan and record of disbursement for operating and maintaining the equipment 2-3. Monitoring sheet for technology transfer 3. Monitoring sheet for technology transfer 4-1. Number of attendants of the seminars and workshops 4-2. Questionnaires to the attendants of the seminars and workshops	a. C/Ps continue to work at IGRM.
(Overall Goal B) Thematic maps for environment conservation and hazard prevention are prepared by IGRM.	1. The area covered with the thematic maps is expanded. 2. The sort of the thematic map increases. 3. Users (other government organizations) are able to access the thematic maps easily.	1. Number of the thematic maps made 2. Sort of the thematic maps made 3. Questionnaires to the users	
(Project Purpose B) IGRM understands how to utilize advanced satellite data such as ASTER and/or PALSAR in environmental or hazardous area study.	1. V and VI of the fields of technology transfer are acquired by the C/Ps concerned.	1. Monitoring sheet for technology transfer	a. C/Ps acquire the method of thematic mapping with field verification. b. Personnel and budget are allocated to continue operations for thematic mapping after the Project ends. c. System for distributing the thematic maps is established.
(Output B) 1. Technology transfer system is established. 2. Equipment and advanced satellite data necessary for technology transfer are operated and maintained properly. 3. C/Ps of DGAA understand how to utilize advanced satellite data such as ASTER and/or PALSAR in environmental or hazardous area study.	1. (Same as Output A) 2. (Same as Output A) 3. (Same as Project Purpose B)		

ANNEX 15

MONITORING AND EVALUATION PLAN (Draft)

November 7, 2000

O. Outline of the Project

Name of the Project	Regional Geological Mapping with Advanced Satellite Data in the Argentine Republic
Term of Cooperation	From March 1, 2001 to February 28, 2005
Responsible Person	Argentine P.M, Japanese CA

I. Plan of the Project

1. Project Design Matrix (PDM)

-The PDM was formulated by the Japanese Implementation Study Team in consultation with the Argentine side on(Annex ****)

2. Plan of Operations (PO)

-The PO was formulated by the Japanese Implementation Study Team in consultation with the Argentine side on(Annex ****)

-The PO will be reviewed annually in March by the Project Team and revised if necessity arises.

-The APO for the next Japanese Fiscal Year will be settled on annually in March by the Project Team (Annex****).

II. Operation System of Monitoring and Evaluation

1. Monitoring

(1) Semi Annual Monitoring

-This will be implemented quarterly by the Japanese long term expert and Coordinators(Project team) in order to monitor the progress of the activities along with the PO.

(2) Annual Monitoring

-This will be implemented semiannually(March and September) by the Project team in order to monitor the progress of the activities along with the PO and the achievement of the outputs along with PDM indicators. The summarized results will be distributed to the organizations and/or personnels concerned with the Project.

-The result of the monitoring by the Project team will be confirmed by the Japanese Management Consultation team and Joint Coodinating Committee in March.

2. Evaluation

(1) Mid-Term Evaluation

-This will be conducted by the Project Team, Japanese Management Consultation Team and Joint Coordinating Committee (JCC) in the middle of the cooperation period of the Project in order to mid-term-evaluate the five (5) basic evaluation components.

(2) Pre-Evaluation

-This will be conducted by the Project Team two (2) or three (3) months before the Final Evaluation in order to pre-evaluate the five (5) basic evaluation components.

(3) Final Evaluation

-This will be conducted jointly by both sides approximately six (6) months before the termination of the cooperation period of the Project by the both Governments through JICA and SEGEMAR in order to examine the level of achivement of the master plan of the Projects as stipulated in the Records of Discussion (R/D) in December 2000.

III. Tentative Schedule for Monitoring and Evaluation

Time	Kinds of Monitoring/Evaluation	Organizations In Charge	Methods
by September 2001	Establishing monitoring plan and system	Project Team	Monitor the progress of the activities along with the PO
September 2001	Semiannual Monitoring		Monitor the progress of the activities along with the PO
March 2002	Annual Monitoring	Project Team Japanese Management Consultation Team Joint Coordinating Committee	Monitor the progress of the activities along with the PO Monitor the achievement of the outputs along with PDM indicators
September 2002	Semiannual Monitoring	Project Team	Monitor the progress of the activities along with the PO Monitor the achievement of the outputs along with PDM indicators
March 2003	Annual Monitoring Mid-term Evaluation	Project Team Japanese Management Consultation Team Join Coordinating Committee	Monitor the progress of the activities along with the PO Monitor the achievement of the outputs along with PDM indicators Analyze with five(5) Basic Evaluation Components
September 2003	Semiannual Monitoring	Project Team	Monitor the progress of the activities along with the PO
March 2004	Annual Monitoring	Project Team Japanese Management Consultation Team Joint Coordinating Committee	Monitor the progress of the activities along with the PO Monitor the achievement of the outputs along with PDM indicators
June 2004	Pre-Evaluation	Project Team	Analyze with five(5) Basic Evaluation Components
September 2004	Final Evaluation	Both Governments	Analyze with five(5) Basic Evaluation Components

IV. Subjects of Monitoring and Evaluation

1. Monitoring

-The subjects of Monitoring are explained in Annex****

2. Evaluation

-The subjects of evaluation are explained in Annex ****

<<MONITORING & EVALUATION SHEET - Provisional>>

1. Date of Monitoring (Quarterly/Semi-Annual/Annual)

2. Person(s) Who Carryied Out Monitoring (Name, Official Title, Qualification)

3. Results I (Themes and Subjects of Technology Transfer)

Theme & Subject	Proceeding										Achievement									
	C/P A	C/P B	C/P C	C/P D	C/P E	C/P F	C/P G	C/P H	C/P I	C/P J	C/P A	C/P B	C/P C	C/P D	C/P E	C/P F	C/P G	C/P H	C/P I	C/P J
1. Introductory training for hardware and software to make thematic maps using advanced satellite data such as ASTER and/or PALSAR																				
2. Introduction on interpretation examples using ASTER simulation data																				
3. ASTER data processing																				
4. Utilization of ASTER DEM																				
5. Alteration mapping and silica content mapping by ASTER data																				
6. Field verification survey for alteration mapping and silica content mapping																				
7. Integrated geological interpretation by ASTER data																				
8. PALSAR data analysis																				
9. Introduction on hyperspectral data analysis																				
10. Introduction on environmental analysis using ASTER and/or PALSAR																				
11. Introduction on hazardous area analysis using ASTER and/or PALSAR																				
12. Instruction on field survey for environmental/hazardous area mapping																				
13																				
14																				
15																				
16																				
17																				
18																				
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30																				

31. Alteration mineral maps and lithologic maps with silica content of quality are made		
32. Environmental and hazardous area analysis maps are acquired		

4. Results II (Technology Tranfer Systems and Organizations)

System & Organization	Proceeding	Achievement
1. Stuff allocation as planned		
2. Expert allocation as planned		
3. Make the plan of operation		
4. Establishment on budgetary plan		
5. Implementation of the monitoring and evaluation plan		
6. Operation the joint coordinating committee		
7. Implementation of equipment operation and maintenance plan		
8. Establishment on data management systems		
9. Procurement and installation of necessary equipment		
10. Allocation of budget for operation and maintenance of equipment		
11. Instruction on operation and maintenance of equipment		
12. Holding for seminars and workshops		

5. Summary and Comments

1. Summary of This Term (1. Expansion of areas covered by the thematic maps, 2. Increase in the sort of thematic maps, 3. Users (government organizations and private companies) being able to access the thematic maps easily):
2. Comments:
3. Joint Coodinating Committee Comments:

Five (5) Basic Evaluation Components

1. Five (5) Basic Evaluation Components

The five basic components defined by JICA as mentioned below are in line with those used for the evaluation works by DAC and other international assistance organization. Introduction of these components has enabled a consistent, well-balanced evaluation, which minimizes evaluator bias. Further, it allows us to share the results, knowledge and lessons with other aid organizations, since we are using common components and can discuss with them from the same viewpoints.

(1) Efficiency

Evaluate the method, procedure, term and cost of the project with a view to productivity.

(2) Effectiveness

Evaluate the results in comparison with the goals (or revised ones) defined at the initial or intermediate stage, and evaluate the attributes (factors and conditions) of the results.

(3) Impact

Evaluate the positive and negative effects of the project, extent of the effect and beneficiaries.

(4) Relevance

Preliminary evaluate whether the needs in the country have been correctly identified, and whether the design is consistent with the national and/or master plan.

(5) Sustainability

Evaluate the autonomy and sustainability of the project after the termination of cooperation, from the perspectives of operation, management, economy, finance and technology.

2. Relation between Five Basic Components and PDM

The following five components are used for the evaluation and a selection of a project.

(1) Efficiency

(2) Effectiveness

(3) Impact

(4) Relevance

(5) Sustainability

These components are directly connected to the elements of PDM as shown in the Figure in the following page.

The component "Efficiency" is a measure to qualitatively and quantitatively compare all resource (input) to the results (output) of the project in order to evaluate the economic efficiency or conversion from input to output.

The parameter "Effectiveness" us a measure to evaluate whether the purpose has been achieved or not, or to evaluate how much the outputs contributed to the achievement of the purpose, or to evaluate whether or not the characteristics of the outputs were as expected.

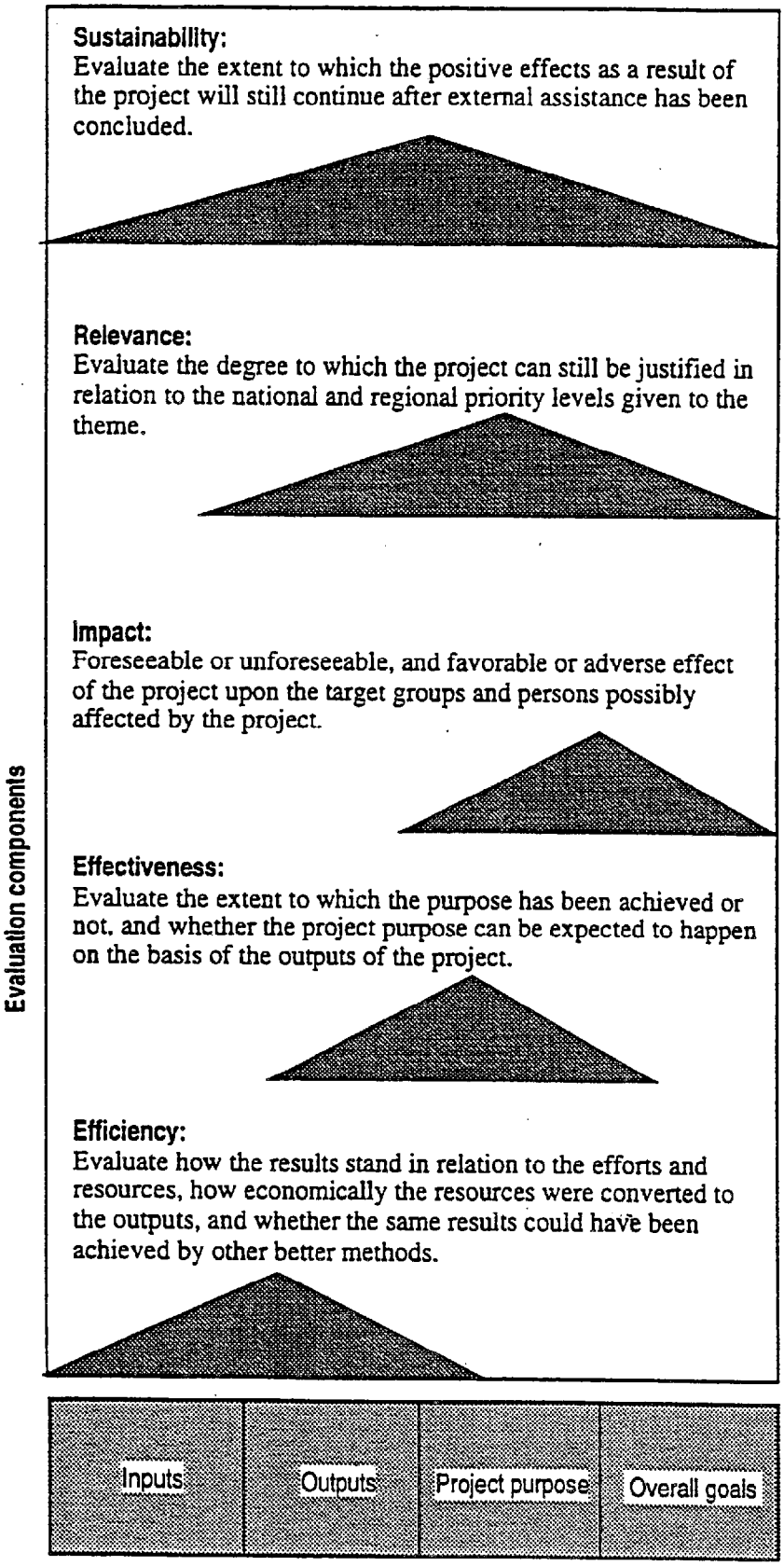
The parameter "Impact" is a foreseeable or unforeseeable, and a favorable or adverse effect of the project upon society. The evaluate impact, both the goal and project purpose should be referred to in the beginning of the evaluation. Evaluation with this components could lead to more than the confirmation as whether or not the goals have been obtained. Evaluation with this component requires comprehensive surveys in many cases.

The parameter "Relevance" is to comprehensively evaluate whether or not the project meets the overall goals, politics of both the donor and recipient, local needs and given priority levels, in order to decide whether the project should be continued, reformulated or terminated.

The component "Sustainability" is to comprehensively evaluate how long the favorable effect as a result of the project can continue after the project has been terminated. Evaluation with this component is required to decide how much the local resources should continue to be used for the project, and to evaluate how much the country receiving the assistance has been considering important. According to OECD (1989), "Sustainability" is a component to be used for the final test of the success of a development project.

All five components are essential for any of the projects or programs. The five components give necessary information to the decision maker so that he/she can decide how to approach the next step. Since each of the five components build on the intervention strategy, they also lay the foundation for standardization in monitoring and information handling within and among organizations and agencies.

In practice, each of the five parameters should also contain project-specific information.



Five Components vs. Goal Hierarchy

Functions and Composition of Joint Coordinating Committee

1 Functions

The Joint Coordinating Committee will be held at least once a year and whenever necessity arises. Its functions are as follows:

(1) To settle on the Annual Plan of Operations (APO) of the Project in line with the Tentative Schedule of Implementation (TSI) and the Plan of Operations (PO) formulated under the framework of the Record of Discussions;
(2) To coordinate necessary actions to be taken by both sides;
(3) To review the overall progress of the Project
(4) To exchange views on major issues arising from or in connection with the PO.

2 Composition

(1) Chairperson
President of SEGEMAR
(2) Members
(Argentine side)
(a) Director of IGRM
(b) Director of Regional Geology Direction (Dirección de Geología Regional: DGR)
(c) Coordinator of Coordination of Regional Delegation (Coordinación Técnica de Delegaciones Regionales: CTDR)
(d) Director of Environmental and Applied Geology Direction (Dirección de Geología Ambiental y Aplicada: DGAA)
(e) Director of Geological and Mining Resources Direction (Dirección de Recursos Geológico-Mineros:DRGM)
(f) Acting Director of Remote Sensing and GIS Division (Unidad de Sensores Remotos y Sistemas de Información Geografica: UNIDAD SRySIG)
(g) Other personnel concerned with the Project decided by the Argentine Republic side, if necessary

(Japanese side)
(a) Chief Advisor
(b) Coordinator
(c) Other Japanese Experts designated by the Chief Advisor
(d) Representative(s) of JICA Office in the Argentine Republic
(e) Other personnel concerned to be decided and dispatched by JICA, if necessary

Note : Official(s) of the Embassy of Japan may attend the Joint Coordinating Committee meeting as observer(s).

ANNEX 18

List of Attendance at the Meetings

Argentine Side

(1)Secretariat of Energy and Mining

Mr. Carlos A Petersen	General Coordinator of Mining

a. SEGEMAR

Mr. Juan Carlos Sabalúa	Executive Secretary (Secretario Ejecutivo)
Mr. José E. Mendía	Director of Geology and Mineral Resources Institute (Instituto de Geología y Recursos Minerales : IGRM)
Ms. Graciela Marín	Acting Director of Remote Sensing and GIS Division (Unidad de Sensores Remotos y Sistema de Información Geografica : Unidad SR y GIS), IGRM
Mr. Antonio Lizuain	Director of Regional Geology Direction (Dirección de Geología Regional : DGR), IGRM
Mr. Mario R. Franchi	Coordinator of Program Geological Maps, IGRM
Mr. Eduardo Zappettini	Director of Geological and Mining Resources Direction (Dirección de Recursos Geológico Mineros : DGRM), IGRM
Mr. Omar R. Lapido	Director of Environmental and Applied Geology Direction (Dirección de Geología Ambiental y Aplicada : DGAA), IGRM

b. National Direction of Mining

Mr. Miguel A. Guerrero	National Director of Mining

c. Expert of JICA

Mr. Kyoichi Koyama	Expert of Investment Promotion for Exploration and Mining

(2) Ministry of Foreign Affairs

Mr. Fernando R. Lerena	Director of Bilateral Cooperation (Ministerio de Relaciones Exteriores)

Japanese side

(1)Preparatory Study Team

Mr. Kojiro Matsumoto	Leader
Mr. Hitoshi Nakamura	Technical Cooperation Planning
Mr. Kohei Iida	Technical Transfer Planing
Mr. Manabu Kaku	Digital Image Processing
Mr. Itoshi Kohno	Geological Remote Sensing
Ms. Yukari Saito	Preliminary Assessment
Mr. Koji Yamaguchi	Cooperation Planning

(2) JICA Argentine Office

Mr. Juan Carlos Yamamoto	Staff