

REPORT ON TOPOGRAPHIC MAPPING PROJECT
FOR
UPPER STREAM AREA OF NEGARA RIVER BASIN
SOUTH KALIMANTAN, REPUBLIC OF INDONESIA
(Second Year Work)

- Aerial Photography
- Pricking, Field Identification
- Field Completion
- Aerial Triangulation, Stereo Plotting
- Compilation

MARCH 1985

JAPAN INTERNATIONAL COOPERATION AGENCY

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I R
85/043

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Field Completion

Aerial Triangulation. Stereo-Plotting.

Compilation

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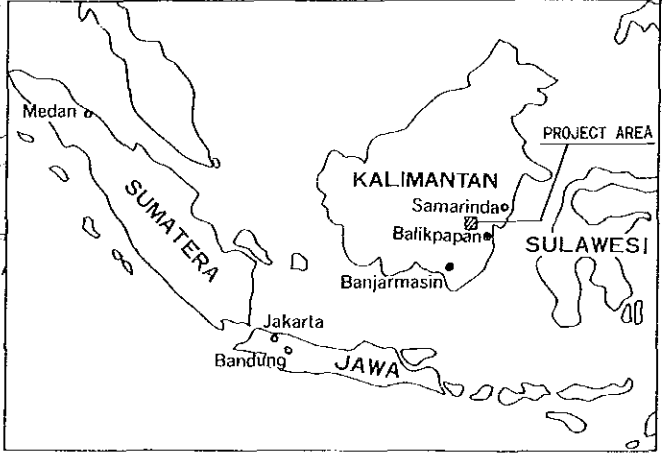
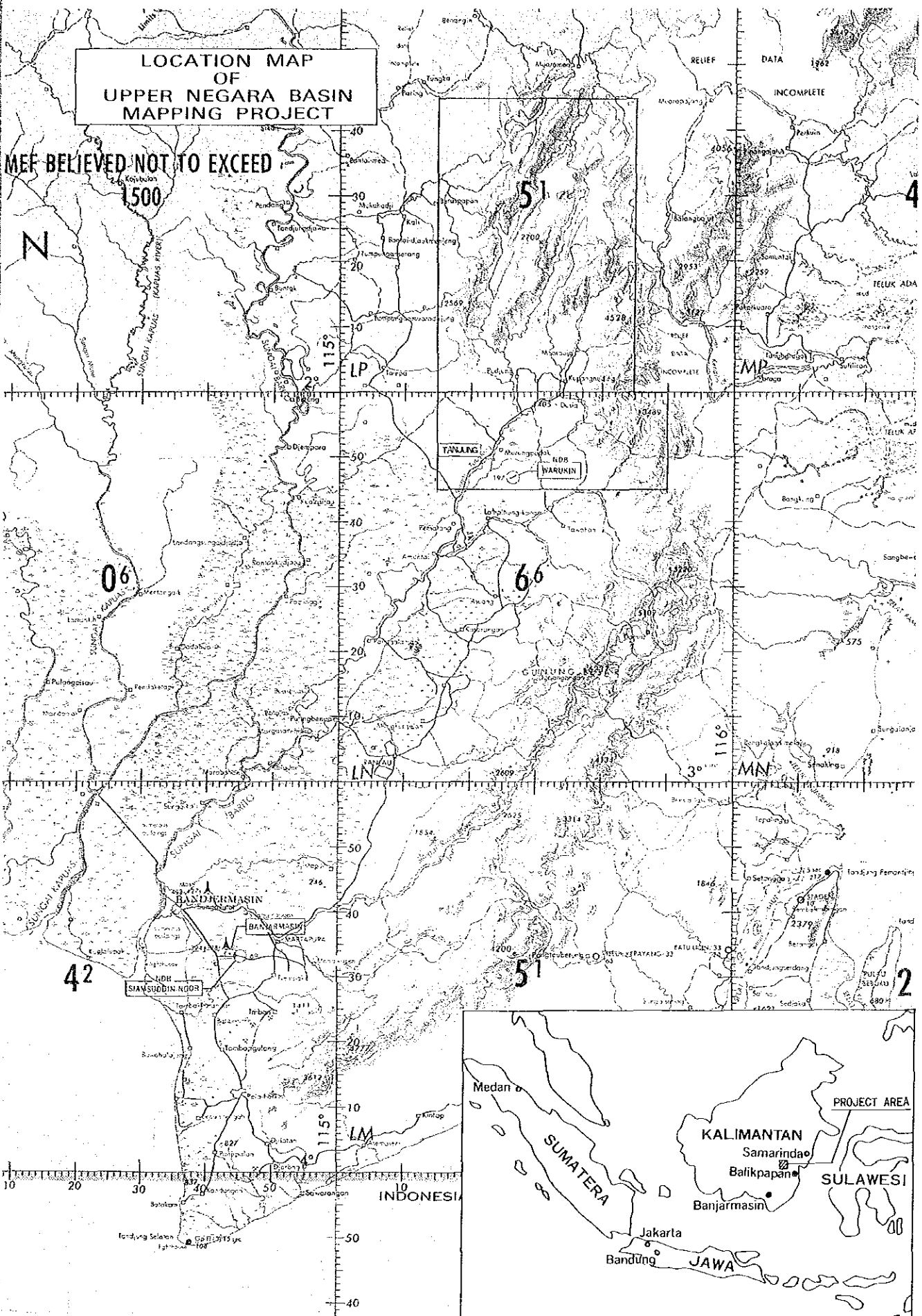
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国際協力事業団

受入 月日 '85. 8. 5	108
登録No. 11809	554
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**LOCATION MAP
OF
UPPER NEGARA BASIN
MAPPING PROJECT**

**MEF BELIEVED NOT TO EXCEED
1500**



Meeting with the Indonesian side



← Discussion on the minutes
(DPU)

Discussion on the map
symbols (BAKOSURTANAL)



Confirmation of adminis-
trative boundaries,
administrative names,
etc. at the field com-
pletion (Government
office of Kabupaten
Tabalong)

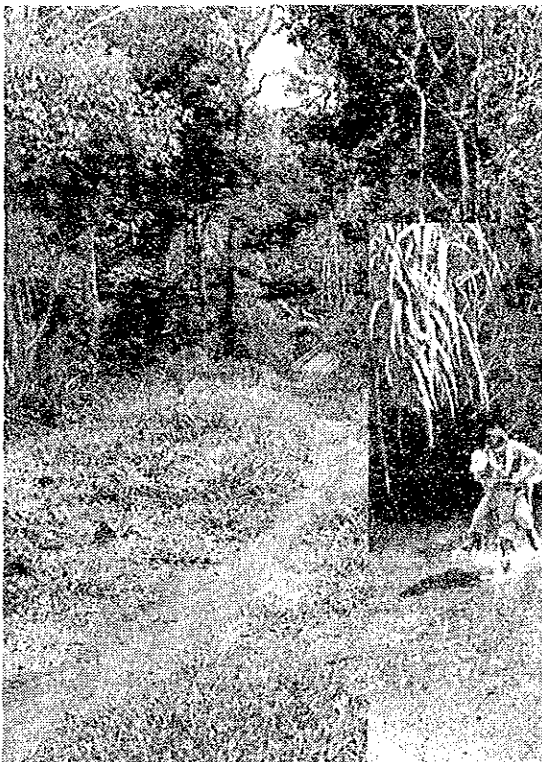


Road



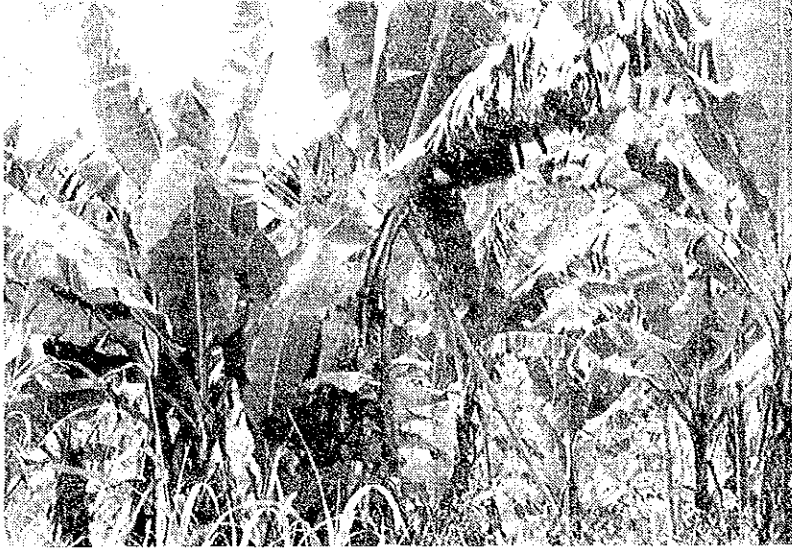
National Highway ←

Company Road
(for timber
transportation) →



Foot Path ←

Farm and Rice Field



Banana



Sing Kong (Tapioka)



Rice Field

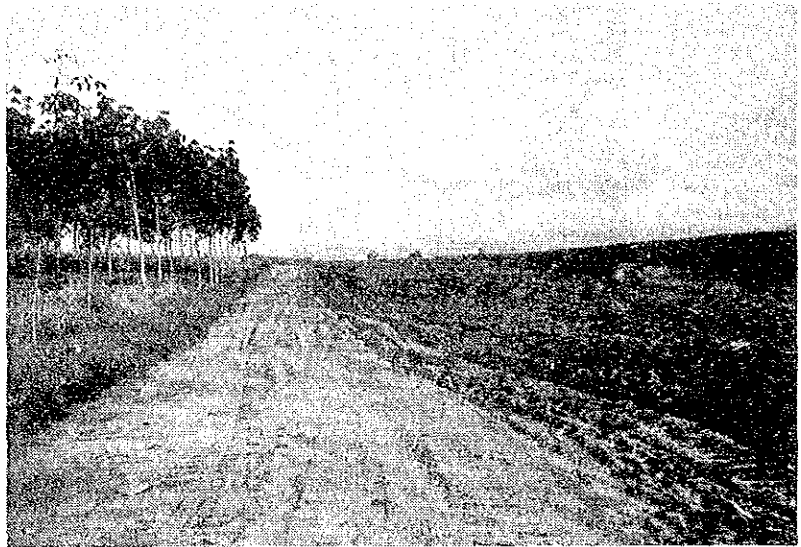


Rubber Plantation

Rubber trees immediately
after plantation. →



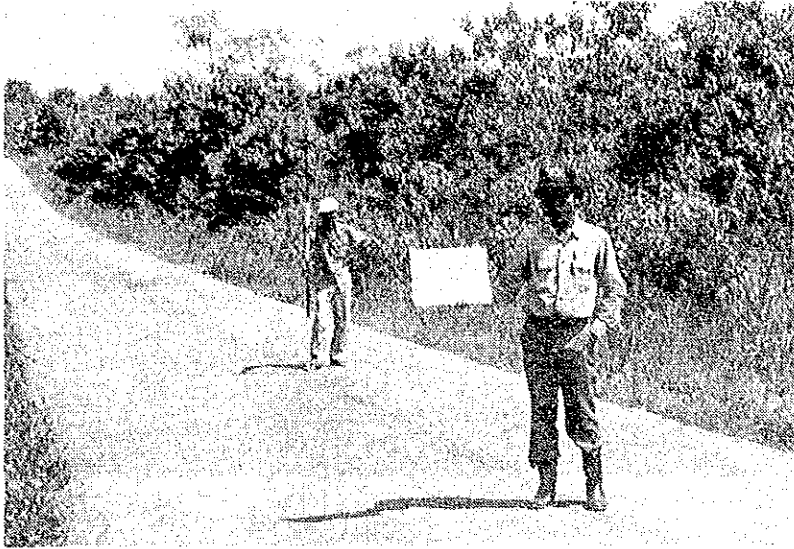
Newly developed land for
rubber plantation and
field. →



Rubber plantation
left uncared. →



Field Work



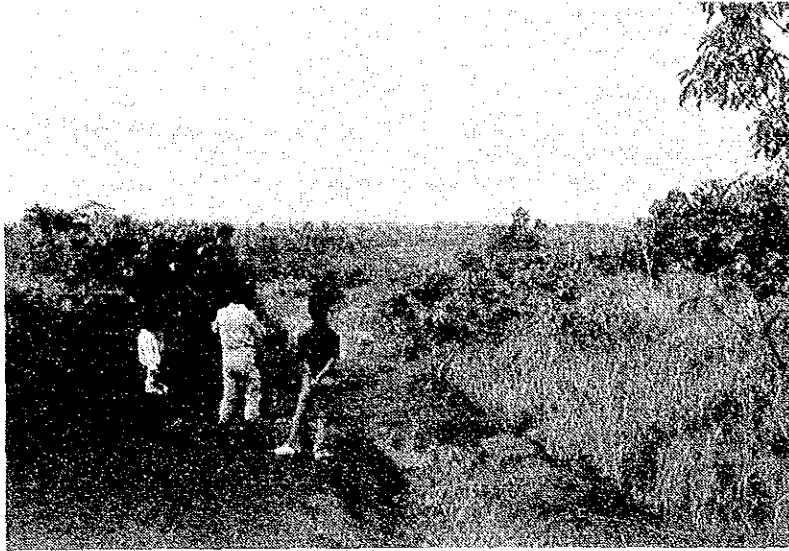
Pricking work



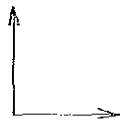
Field completion
work on road

Plane table survey on the
newly constructed highway
which connects Tanjung
and Murungpudak.





Field Identification
work



Field Completion Work



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1 BACKGROUND

The Government of Indonesia has been promoting regional development programmes based on the idea of transmigrating its inhabitants from over-populated areas.

In the South Kalimantan Province, the basin of the Negara River, a tributary of the Barito, has been selected for the programme, the basin being considered as having relatively higher potentiality for regional development of water resources, agriculture and others. However, the basic and useful materials required for promoting the programme such as national geodetic controls, basic maps, etc. have been not available for the region, and it is now felt urgent to provide the region with such essential materials.

Under such circumstances, the Government of Indonesia requested to the Government of Japan cooperation for the topographic mapping project of upper stream area of the Negara River basin in South Kalimantan.

The preliminary survey was carried out for the project by Japan International Cooperation Agency (JICA) for about 50 days of February - April, 1983.

During the preliminary survey, a series of meetings was held with the Directorate General of water Resources Development, Ministry of Public Works (DGWRD, DPU), and the Scope of Work* was signed on April 14, 1983 between the both Governments. This project will, based on the Scope of Work, be carried out for the period of 3 years beginning from the fiscal year 1983 to 1985, consisting of the following major work:

Aerial Photography: Scale 1/60,000 **

Area Approx. 10,000 km²

Topographic mapping: Scale 1/50,000

Area Approx. 6,500 km²

* Topographic mapping project of downstream area of the Negara River basin is also set forth in the Scope of Work.

** The scale of the aerial photography has been changed to 1:50,000, as described in the First Year Report.

2 OUTLINE OF THE SECOND YEAR WORK

2-1 Purpose

The topographic mapping project of upper stream area of the Negara River basin has been formulated in order to provide the region with basic materials such as national geodetic controls, basic maps required for water resources, agricultural developments, which have long been impeded due to non-availability of such essential materials.

In the first year work, the aerial photography and ground control point survey (NNSS observation and leveling) were carried out from July to October 1983 in South Kalimantan, Indonesia. Data processing and report preparation were also conducted in the same year work.

The second year work, following the first year, aimed at implementing work such as pricking, field identification, aerial triangulation, stereo-plotting, compilation, field completion and aerial photography for the remaining area including data processing and report preparation in Indonesia and Japan.

2-2 Outline of project area

The project area is in the South Kalimantan Province for the most part, and at the southern end of the Kalimantan (Borneo) Island. The Kalimantan Island, the third largest Island in the world, lies roughly at the centre of the Malay Islands and belongs to the Great Sunda Islands. With the equator almost at its center, the Kalimantan Island is in region of high temperature and high humidity and has annual average temperature

of 30°C, annual range of 2 - 4°C and annual precipitation exceeding 3,000 mm. The terrain features of the island with such high temperature and humidity are mountainous on the northern and eastern part of the equator, and low and wet vast swamps formed by rivers such as the Barito, Kapuas etc. extend on the southern and western part of it.

The South Kalimantan Province is divided in the east-west direction by the range of mountains extending in the north-south direction which include Aurbunak, Besar, Lumut, Sarempaka and others with an elevation of 1,000 - 1,800 m. The project area lies to the west of the mountain range. Out of the mountainous area flow many rivers and streams which join to form the Barito River pouring into the Java Sea. The river Tabalong flows south-ward from the project area, having small streams as it originates in Sarempaka mountains, and joins the Barito river at Marabahan, changing its name on the way to Negara river. In rather dry area in the basin of these rivers are villages such as Tanjung, Amuntai, Banjarmasin.

For about 250 km from Banjarmasin to Tanjung, leads northward a national highway which has been maintained in a comparatively good condition. The highway branches off in Tanjung in the project area; one road leads over the mountain range to Samarinda in the East Kalimantan, and the other leads to Buntok in the Central Kalimantan. This is the only one national highway available. They have an enterprise road called "Company Road" of timber company and Petroleum Corporation, which leads to the jungle area and hill area.

Villages in the project area other than Tanjung are Haruai, Muarauya, Kelua, Tanta etc. all scattered along the highway. The most parts in the northern mountainous area are virgin jungle without villages at all. Briefing the terrains, vegetation etc. of the project area, it is hilly terrains generally flat with dense brushwoods and grass and also flat swamp alluvial low lands from the southern to northwestern part, and in the eastern part, it is mountainous area changing to jungle in north.

2.3 Work period

(Field Work)	(From)	(To)
Aerial Photography	June 18, 1984	August 26, 1984
Headquarters	July 9, "	September 7, "
Pricking, Field Identification	July 18, "	September 4, "
Field Completion	January 16, 1985	February 15, 1985
(Home Office Work)		
Aerial Triangulation	Middle of August, 1984	Early part of October, 1984
Stereo-plotting	End of September, 1984	Middle of November, 1984
Compilation	Middle of October, 1984	Middle of December, 1984

2-4 Organization of survey team

(Pricking & Field Identification)

General	Sho Saito	July 27 - Aug. 11, 1984 (16 days)
Deputy General	Hiroshi Kimura	July 9 - Sep. 7, 1984 (61 days)
Chief Surveyor	Minoru Murata	July 9 - Sep. 7, 1984 (61 days)
Pricking & Field Identification	Mikio Togashi	July 9 - Sep. 7, 1984 (61 days)
"	Hiroo Morita	July 18 - Sep. 4, 1984 (49 days)
"	Tokuji Morita	July 18 - Sep. 4, 1984 (49 days)
"	Tokuhei Matsuo	July 18 - Sep. 4, 1984 (49 days)
"	Kazuyuki Nishijima	July 18 - Sep. 4, 1984 (49 days)
Supervisor of Aerial Photography	Daikichi Nakajima	June 18 - Aug. 26, 1984 (70 days)

(Field Completion)

General	Sho Saito	Feb. 1 - Feb. 15, 1985 (15 days)
Field Completion	Mikio Togashi	Jan. 16 - Feb. 15, 1985 (31 days)
"	Hiroo Morita	Jan. 16 - Feb. 9, 1985 (25 days)
"	Tokuji Morita	Jan. 16 - Feb. 9, 1985 (25 days)
"	Tokuhei Matsuo	Jan. 16 - Feb. 9, 1985 (25 days)
Map Symbols	Tsutomu Kusaka	Feb. 1 - Feb. 15, 1985 (15 days)

2-5 Amount of work proposed

(1) Aerial Photography

Scale	1:50,000
Flight distance	215 km
Number of Course	5 courses
Number of Photo	60 sheets

(2) Pricking

- i) at every 2 km along the routes of leveling conducted in the first year work
- ii) at NNSS Point (D-A609)

(3) Field Identification

Within the proposed area (6,500 km²)

- i) to conduct the field survey on the specified area (578 km²) along the main roads, and
- ii) to perform the photo-interpretation based on criteria obtained from the field survey for the remaining area

(4) Field Completion

6,500 km ²	9 sheets (net 8.3 sheets)
-----------------------	---------------------------

(5) Aerial Triangulation

400 models

(6) Stereo-plotting

6,500 km ²	9 sheets (net 8.3 sheets)
-----------------------	---------------------------

(7) Compilation

6,500 km ²	9 sheets (net 8.3 sheets)
-----------------------	---------------------------

2-6 Plan and results

Survey Item	Amount of Work	
	Plan	Results
Aerial photography	1. Flight distance 215 km 2. Number of course 5 courses 3. Number of photo 60 sheets	448 km 16 courses 160 sheets
Pricking	1. At every 2 km along the routes of leveling conducted in the 1st year 2. At NNSS point (D-A609)	1. Along the leveling route, at existing leveling points 2 points at new leveling points 30 points at other leveling points 161 points total 193 points 2. At NNSS point D-A609 1 point
Field Identification	6,500 km ²	6,570 km ²
Field completion	6,500 km ² (Net 8.3 sheets)	6,570 km ²
Aerial Triangulation	400 models	426 models
Stereo-plotting	6,500 km ² (Net 8.3 sheets)	6,570 km ² (Net 8.39 sheets)
Compilation	6,500 km ² (Net 8.3 sheets)	6,570 km ² (Net 8.39 sheets)

2.7 Main equipment

The main equipment and instruments used in the second year work are as follows:

(1) Aerial Photography

- 1) Aircraft : Beechcraft Super S.18
- 2) Aerial Camera: Zeiss/Jena MRB. 9/2323 F. 88 mm
- 3) Film : Kodak Double X

(2) Photo Processing

- 1) Developer : Morse Co. Processing Kit (rewind type)
- 2) Contact Printer: Log Electric Co. Electronic Printer

(3) Pricking

Level : Sokkisha B2 (borrowed from DPU)

(4) Field Identification

Measuring tape (cloth) 50 m

(5) Aerial Triangulation

- 1) Point transfer device KERN PMG 2
- 2) Comparator Zeiss/Jena Stecometer
- 3) Computer UNIVAC 1100

(6) Plotting

- 1) Stereo-plotter Zeiss/Jena Stereometrograph G
Wild A10
Zeiss Planimat D2
- 2) Coordinategraph Daini Seikosha D-SCAN

(7) Field Completion

Plane Table 1 set

2-8 Survey schedule

The survey schedule for the second year work is shown in the Appendix.

(see Appendix 1)

2-9 Supervision of field work

In the second year work, JICA sent supervisors to Indonesia for meetings with the Directorate General of Water resources Development, DPU, the Provincial Government of South Kalimantan, etc. and for supervision of the field work as follows:

(For the Field Identification)

Dr. Yoshitake Egawa Overseas Cooperation Officer, International Affairs Div., Economic Affairs Bureau, Ministry of Construction
July 23 - August 11, 1984 (20 days)

(For the Field Completion)

Mr. Minoru Akiyama Overseas Cooperation Officer, International Affairs Div., Economic Affairs Bureau, Ministry of Construction

Mr. Hiroshi Murakami Staff, the First Development Survey Div., Social Development Cooperation Dept., JICA
February 7 - February 15, 1985 (9 days)

2-10 Meetings with Indonesian side

At the time of the field identification work in August 1984 and, also, at the time of the field completion work in February 1985 in the second year, the meetings were held with the Indonesian side.

Outline of the meetings is as follows:

2-10-1 Meetings at the field identification work (Minutes signed on August 10, '84)

Meetings were held at the Directorate General of Water Resources Development, DPU, on the second year work as well as at BAKOSURTANAL in relation to the specifications of map symbols and application (SPESIFIKASI PETA REPABUMI INDONESIA SKALA 1:50,000), which were prerequisite to the field identification work, in technical details. (See Appendix 2 - (1).)

In connection with the supplement items of the above specifications, meeting was also held with the Indonesian side. (See Appendix 2 - (2) Appendix-c "Official Report, 1:50,000 scale Topographic Map")

2-10-2 Meeting at the field completion work (Minutes signed on February 14, '85)

At the Directorate General of Water Resources Development (DGWRD. DPU) as well as at BAKOSURTANAL, meetings were held in connection with the administrative boundaries (Provincial boundary in particular) which could not be confirmed at the time of the field completion work. At the meetings, recognizing that the administrative boundaries should be essentially the matter of the Indonesian side, the date of termination of plotting boundaries by the Indonesian side and its delivery time to Japan were discussed and agreed by the both sides.

Also, detailed technical discussions were held on marginal information, map symbols, zip-a-tone, printing paper, etc. in regard to the drawing and printing work. (See Appendix 2 - (2))

2-11 Cooperation of Indonesian counterparts

At the time of the pricking and field identification work in July - August '84 and the field completion work in January - February '85, the Indonesian officials who cooperated to the survey work were as follows:

	DGWRD. DPU	BAKOSURTANAL	PROVINCIAL GOVERNMENTS
J A K A R T A	Mr. Sarbini Ronodibroto	Prof. Jacob Rails	Mr. Syahrieh Darham
	Mr. M. Sidharta	Mr. Bebas Purnawan	Mr. Donnis N. Singaraca
	Mr. Suharto	Mr. Riadika Mastra	Mr. Dandung S.
	Mr. Soetopo		Mr. Ardansyah Fama
	Mr. Baban A.		Mr. Eddy Rosasi
	Mr. Kartono		Mr. H. Bakeri BA
	Mr. ALi Syahbana		Mr. Nasir Nasution
	Mr. Hilman Kosasih		Mr. Bramantyo
	Mr. Harianto W.		Mr. M. Moelyono
	Mr. Subandiyo		Mr. R. M. Manurung
	Mr. Pramono		Mr. Amrullah
Mr. Moh. Rusfai		Mr. Gt. Zulfikar	
Mr. Beddi Juwadi		Mr. Dyaya Fitriani	
B A N J A R A M A S I N	Mr. Hally Dezar		Mr. Ardiansyah
	Mr. A. Tamdjid		Mr. Ismet
	Mr. Rachmat Norlias		Mr. Gt. M. Jumberi
	Mr. T. Eko Haryanto		Mr. Yuhanie D.
	Mr. Keiji Miya		Mr. H. Djohansyah
	Mr. Zulkarnain B. SC		Mr. Irawan S.
	Mr. Fx Agus Susanto		Mr. Rifani
	Mr. Nana Nasuha BE		Mr. M. Nawawi BA.
	Mr. Suwoto		Mr. Yusran Kaderi
	Mr. Didy Sukardi		Mr. Satar A.
T A N J U N G	Mr. M. Syamsi Fadilah		Mr. Hariaman Harian
	Mr. Yussie BE		Mr. Heru Agus Utomo
			Mr. Maskuni BA
			Mr. Darwin Awi BA

. : Indonesian Counterparts in the second year work.

3 PREPARATION FOR FIELD SURVEY

3-1 Survey headquarters (base camp)

The survey headquarters and base camp were set up at the same place as that of the last year of which address is given below. The town of Tanjung has a population of about 20,000 and is the centre of administration, economy, culture, etc. of the Kabupaten Tabalong. The national highway leads from Banjarmasin to Tanjung where it branches off to the central and East Kalimantan. Thus, Tanjung City occupies convenient location for the transportation in the project area. However, there was no modern hotel in this town but several village inns used by the travelling salesmen. Shops in the town were also small and they sold only daily necessities. It was indeed a very inconvenient place for daily life, but on the other hand, it could be said that this place was the only place which formed a town in the project area. Taking the above matters into consideration, and due to the reason of security, one of the inns provided with comparatively good accommodation facilities was selected for the headquarters.

Name of Inn: Penginapan Tabalong

Address : Tanjung, South Kalimantan

3-2 Charter of survey vehicles, etc.

As same as the case in the last year, it was impossible to charter vehicles for survey activity in Tanjung. The cartage was made in Banjarmasin and the vehicle was transported to Tanjung for about 240 km. Considering the local terrain conditions which were hilly at the most part, and the poor road

condition caused by a prolonged rainy season due to unusual weather, selection of the type of vehicle and a driver were made putting a priority on those which had an experience in the first year work. For the field completion work, particularly, selection of vehicles and drivers who had well experienced in the first and the second year work, were carefully performed, considering the work condition in the midst of rainy season and short period of work.

3-3 Telecommunication

In order to make a direct communication to Japan or to Jakarta from Tanjung, it was necessary to drive up to Banjarmasin. In Tanjung, the radio facility was available only at the District Police Station and the District Office, but such facility was not open for the public use. The wireless radio could not be used because of the Indonesian law and regulations. Postal service was also very poor. For example, it took about fifteen days for a letter to reach Banjarmasin through Jakarta from Japan.

3-4 Pass ("Surat Jalan")

The survey team members working in Indonesia should carry the pass and the passport. It took several days to obtain the pass, therefore, it was necessary to take this matter into consideration when a working schedule was planned.

4 AERIAL PHOTOGRAPHY

4-1 Outline of work

Photographing and check of photographs were executed for the Northern mountainous area, where has not been covered by the first year work. The aerial photographing and the photograph check were planned as follows:

- a. Number of photographing course - 5 courses
- b. Number of photographs taken for check - 60 sheets

4-2 Aerial photographing

Taking the result of the first year work into consideration, photographing was executed in the latter part of June preceding the field work. The climate at the project area was worse than the last year. In the every afternoon, it came to rain and in the early morning, the staff had, before taking off, to collect the weather information at the air port office, Balikpapan Air Port, or from the crew of a regular air line who flew on the project area.

As same as the last year, there were very few chances for photographing. Partial blue sky observed in the morning was soon shadowed by a rapid growth of clouds. The aircraft crews were instructed everyday to fly to the project area for the photographing. In case impossible to take a photograph due to bad weather, the aircraft conducted to fly over the proposed course for confirmation of the point to be photographed.

Photography of the courses 01, 0A, 1B and 2B had been executed twice each due to sudden change of weather on the way of operation, however, the flight altitude could be kept to the flight datum plane set before. In August, from around 10th of the month, fuel at the airbase became short and the aircraft had to drop at the Balikpapan Air Port for fuel supply several times. Number of days and flight frequency required for photography were as follows:

Total photographing days	- 47 days
Flight frequency	- 46 days
Total flight hour	- 114 hrs. 35 min.

(Details)

Flight hours including test flight	- 24 hrs. 30 min.
Return without exposure	- 90 hrs. 05 min.

4-3 Photographic processing and check

Photographs were processed according to the same standard of the last year. Processing material and equipment such as processing chemicals, photographic paper, processing equipment, etc. of the same grade as of the last year were used. The exposed films were developed by one roll and contact prints were produced for check. The check was made according to the checking list. Care was taken to make prints of all the exposed films for check. The final print was made at Cibogo Lab. of P.T. EXSA International Co., Ltd. and, at the same time, the annotation was also checked.

Table 1 Daily Photographing Report

Date	Flight Time	Weather	Remarks
June 22			Photographic contract signed with P.T. EXSA International Co., Ltd.
June 23	06:10 - 09:35 (3h 25 m)		The aircraft moved from Jakarta to Banjarmasin Airport. Until July 3 - check and adjustment of the aircraft, photographic equipment, meeting with the staff of EXSA and test flight.
July 3	10:45 - 12:50 2h 05m	fine	Test of photography
4	07:55 - 10:25 2h 30m	fine/rainy	Return due to heavy clouds
5	07:30 - 09:45 2h 15m	cloudy	"
6	14:30 - 16:30 2h 00m	rainy/cloudy	"
7	07:25 - 09:25 2h 00m	cloudy	"
8	07:35 - 10:15 2h 40m	fine	"
9	07:25 - 10:45 3h 20m	cloudy	C-14
10	07:25 - 09:15 1h 50m	rainy/cloudy	Return due to heavy clouds
11	07:25 - 09:25 2h 00m	cloudy	"
12	07:55 - 09:55 2h 00m	cloudy	"
13	07:45 - 09:50 2h 05m	cloudy	"
14	09:45 - 10:45 1h 00m	rainy	Return due to rain
15	07:15 - 09:50 2h 35m	cloudy	Return due to heavy clouds
16	07:30 - 10:35 3h 05m	fine/rainy	"
17	08:00 - 09:45 1h 45m	rainy/fine	"
18	07:30 - 09:55 2h 25m	cloudy	"
19		rainy	No flight due to rain
20	07:20 - 09:40 2h 20m	cloudy	Return due to heavy clouds

Date	Flight Time	Weather	Remarks
July 21	07:30 - 09:40 2h 10m	cloudy	Return due to heavy clouds
22	08:30 - 10:40 2h 10m	"	"
23	08:15 - 11:05 2h 50m	cloudy/rainy	Return due to rain
24	07:30 - 11:15 3h 45m	fine	C-4, C-3B
25	07:35 - 10:00 2h 25m	fine	Return due to heavy clouds
26	07:20 - 11:35 4h 15m	fine	C-0, C-1, C-2, C-3, C-4C
27	07:30 - 11:35 4h 05m	cloudy	C-8A, C-5A, C-5B, C-15
28	08:00 - 10:30 2h 30m	fine	Return due to heavy clouds
29	07:50 - 10:25 2h 35m	cloudy	"
30	07:30 - 10:05 2h 35m	fine	"
31	07:45 - 10:00 2h 15m	cloudy	"
Aug. 1	07:25 - 09:35 2h 10m	fine	"
2	07:30 - 09:45 2h 15m	cloudy	"
3	07:30 - 09:35 2h 05m	cloudy	"
4	07:40 - 09:50 2h 10m	cloudy	"
5	07:30 - 09:55 2h 25m	fine	"
6	07:30 - 09:50 2h 20m	cloudy	"
7	07:25 - 09:25 2h 00m	fine/rainy	"
8	07:30 - 09:45 2h 15m	fine/rainy	"
9	07:25 - 09:35 2h 10m	fine	"
10	07:40 - 09:10 1h 30m	cloudy	"
	12:05 - 13:30 1h 25m		"
11	07:25 - 09:30 2h 05m	cloudy	"
12	07:20 - 10:20 3h 00m	fine/cloudy	"
13	08:00 - 09:35 1h 35m	rainy	Return due to rain
14	07:25 - 09:45 2h 20m		
	11:15 - 12:35 1h 20m	fine	C-4G, C-0A, C-1B, C-2B

Date	Flight Time	Weather	Remarks
Aug. 15	07:45 - 09:55 2h 10m	cloudy/fine	Return due to heavy clouds
16	07:35 - 09:45 2h 10m		"
	10:40 - 12:05 1h 25m	cloudy	"
17	07:25 - 08:55 1h 30m		"
	10:25 - 11:50 1h 25m	fine	"
18	07:10 - 09:10 2h 00m		
	09:35 - 10:55 1h 20m	fine	C-16
19	07:50 - 11:30 (3h 40m)		Ferry flight: Banjarmasin - Sumaran - Jakarta.

4-4 Organization of photographing crew

The line up of the photographing operation is as follows:

Supervisor and Inspector: Mr. Daikichi Nakajima
Pilot : Mr. Martono, Mr. Suparno &
Mr. Tan G.P.
Co-Pilot/Mechanic : Mr. Utoyo, Mr. Turkan
Navigator : Mr. Sumardi
Photographer : Mr. Maryadi Anis
Photo Processing : Mr. Subaryanto

4-5 Result of photographing and check

Aerial photography and the check work had been executed within the contract period. However, owing to the difficulties to identify the actual terrain features with the topographic map used for this flight plan, it was necessary to take pictures of more courses than those estimated in the original plan.

A part of some photographs were covered by clouds but most of them were outside of the mapping area giving not serious influence to the aerial triangulation and considered sufficient. A clock of camera and a instrument number counter were not in good order and some photographs had not such information on them. However, those were considered not serious defect to the aerial triangulation and subsequent work, and instruction was given to continue the operation. The result of photographing and check were as follows:

- 1) Number of film : 2 rolls
- 2) Number of planned flight course: 5 courses

- 3) Number of flight course covered: 16 courses
- 4) Number of photos taken : 160 sheets
- 5) Total flight distance : 448 km

In the project area, weather used to change abruptly from fine to cloudy and the photographing operation had to be conducted within short period of favourable time. Due to such climatic characteristics, existence of small part of clouds was considered unavoidable as far as the plotting would not be obstructed.

However, utmost care had been paid on the checking work of the photos taken, particularly on the following points:

- 1) Photo of which principal point, major villages, etc. should not be covered by clouds.
- 2) Photo should not give any unfavourable effects on the aerial triangulation.

Fig. 1 Index Map of Aerial Photography

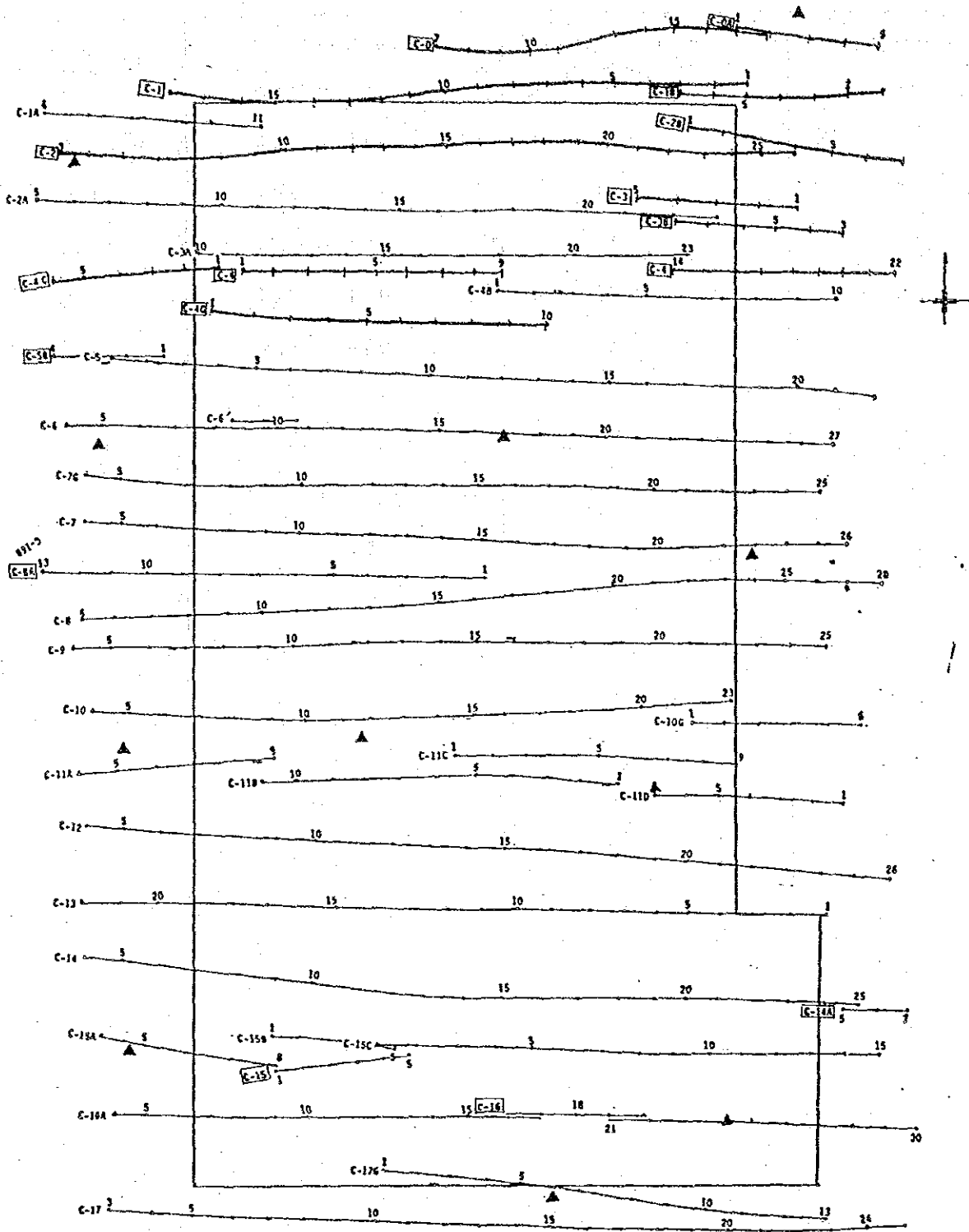


Photo scale about 1:50.000

- [C-0] Course of Aerial Photography (the 2nd year)
- C-6 Course of Aerial Photography (the 1st year)

Table 2 Number of Aerial Photographs by Courses

Course No.	Counter No.	Compiled No.	Amount
C-0	179 - 192	5 - 18	14
C-0A	410 - 414	1 - 5	5
C-1	105 - 124	1 - 20	20
C-1B	415 - 421	1 - 7	7
C-2	125 - 150	1 - 26	26
C-2B	422 - 428	1 - 7	7
C-3	151 - 155	1 - 5	5
C-3B	25 - 32	1 - 8	8
C-4	3 - 11, 16 - 24	1 - 9, 14 - 22	18
C-4C	167 - 174	1 - 8	8
C-4G	397 - 406	1 - 10	10
C-5B	201 - 205	1 - 5	5
C-8A	175 - 187	1 - 13	13
C-14A	8 - 10	5 - 7	3
C-15	300 - 305	1 - 6	6
C-16	571 - 575	5 - 9	5
Total			160 sheets

5 FIELD WORK (PRICKING, FIELD IDENTIFICATION, FIELD COMPLETION)

5-1 Outline of work

5-1-1 Pricking

Pricking was made for use them as the picture point of the aerial triangulation and plotting work to be executed in Japan. Bench mark prickings were made on the 2-time enlargement aerial photograph with the monumented points of the direct levelling route (2nd and 3rd orders) and indirect levelling route, which were carried out in the first year work, and other selected points which elevation measured on the routes at 2 km interval for photo orientation.

Pricking of NNSS observation point (D-A609) were made on the photographs taken in the second year work.

5-1-2 Field identification

Field identification was executed for items to be expressed on the map for the stereo-plotting and compilation work. For 578 km² of the total project area of 6,500 km², the area along the main roads, the field survey was made according to the contact prints of the aerial photographs, which were carried by the survey team, and the rest of the area was made by photographic interpretation according to criteria got by the field survey.

5-1.3 Field completion

Using copies of compilation manuscripts, administrative boundaries, geographic names within the project area of 6,500 km² have been checked and confirmed. In addition to the uncertain items, omitted items, etc. were checked. Also meetings were held to discuss about drawings and printing work.

5-2 Pricking

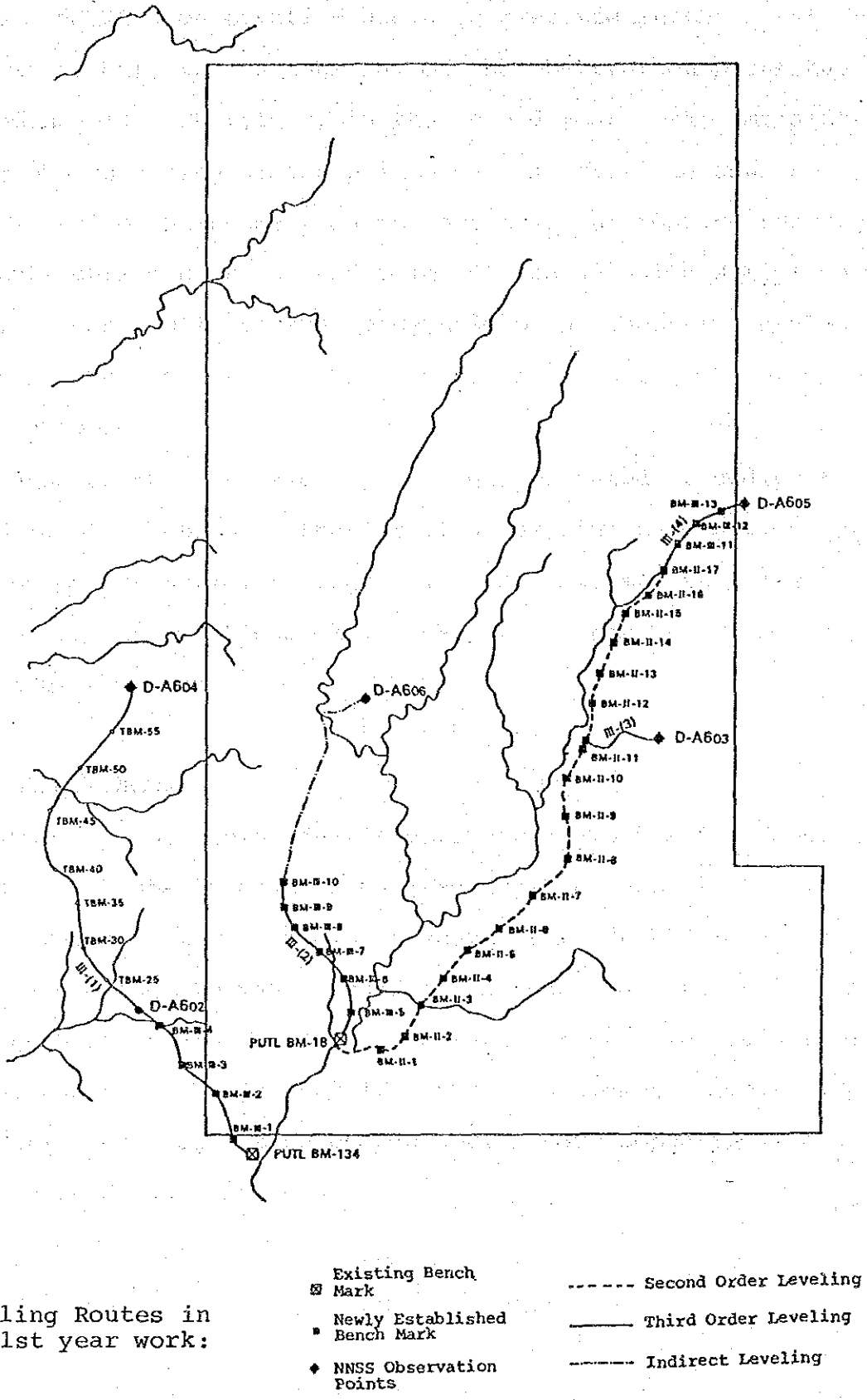
5-2.1 Pricking of leveling points

Monumented points (2 existing bench marks, 17 2nd order and 13 3rd order points) on the direct leveling route which had been set in the first year work, were pricked on the 2-time enlargement photographs (scale: about 1/25,000).

The bench marks selected for photo orientation were road crossings, bridges, houses, crossings of vegetation boundary and extended lines of road on the direct and indirect leveling routes, which were selected as distinguished points on the photographs. Those points were observed with levels (SOKKISHA B2) from the neighboring bench mark monuments, temporary bench marks and indirect leveling points in cm unit by direct leveling and pricked on the 2-time enlargement photographs. The elevation value at the pricking points were calculated from the results of the first year work and shown on the 2-time enlargement photos with red ink in centimeters along with the name of the point. Observation of the pricking points was originally planned by plane table survey. However, owing to the facts that the intervisibility was longer than estimated,

the observation was done using the levels borrowed from the Indonesian side in exchange for giving technical guidance by the Japanese side.

Fig. 2 Route Map of Pricking Work



Leveling Routes in the 1st year work:

- Existing Bench Mark
- Newly Established Bench Mark
- NNSS Observation Points
- Second Order Leveling
- Third Order Leveling
- Indirect Leveling Points

5-2-2 Pricking of NNSS observation point

Regarding NNSS Observation Point, installation of the signal and NNSS observation had been executed in the first year work, but, the photography of the observation point had not been done. Therefore, in the second year work, immediately after photographing of the point, it was tried to confirm by the 5-time enlargement photograph. As the result, the signal was not confirmed but by referring of the signal description note, it was confirmed that eccentric point (house) was clearly taken in the photograph. Therefore, the pricking was made in the desk work.

Considering the pricking work was executed preceding the field identification so that it might be finished in time for the subsequent aerial triangulation process, the final result of the pricking work was carried back to Japan by Mr. Saito, leader of the team.

5-3 Field identification

The area of field identification was 6,500 km². However, the area was mostly covered by inaccessible mountains. Therefore, the field work was executed for 578 km², most of which are along the major roads and access roads to the villages (about 450 km). Administrative boundaries, geographical names, road and bridge classifications, building symbols, vegetation and vegetation boundaries, river, topography, etc. were checked and confirmed.

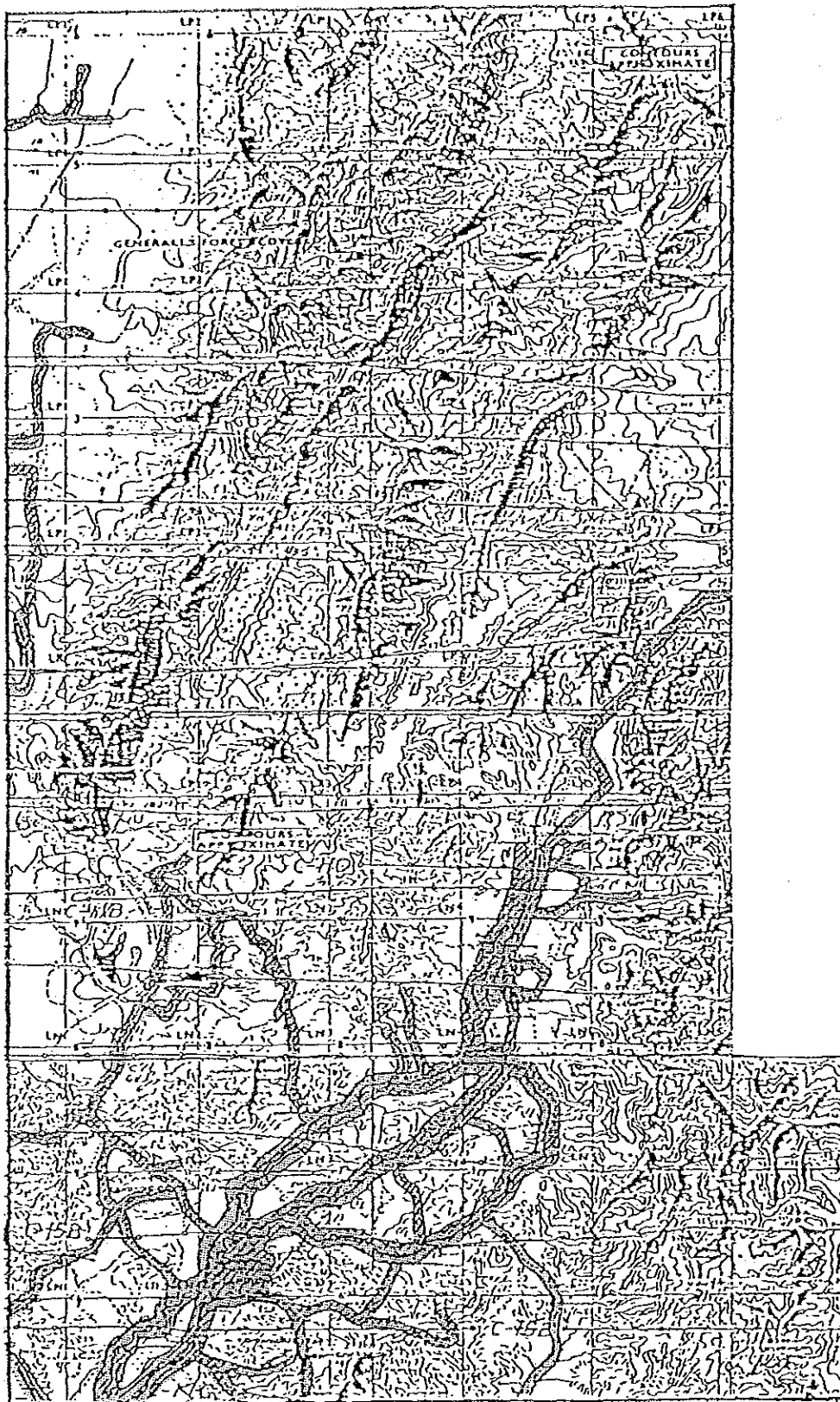
At the same time, information for annotation such as, administrative boundaries, geographical names and others were collected at the local offices concerned.

For the inaccessible area, the photograph interpretation was made according to criteria obtained from the field reconnaissance work. The result of the field identification was classified and inked on the contact prints of the photos (with odd number) in three colors (red, blue and green). Geographical names were plotted on the overlays of the photos.

It was impossible to plot the administrative boundaries due to the reason that the most of the drawings provided by Indonesian side had no description of the scale or topographic feature. As the result of the discussion with BAKOSURTANAL on this matter, it was decided that such information would be plotted on the copies of the compilation manuscripts at the time of field completion by Indonesian side.

As to the map symbols, Specifications of Map Symbols and Application for 1:50,000 National Base Map, provided by the Indonesian side in the first year, (SPESIFIKASI PETA RUPABUMI INDONESIA SKALA 1:50,000 BAKOSURTANAL) was applied according to the instruction of the Indonesian side. Regarding the map symbols, study had been made in Japan before departure of the team and the questions raised about the application of the map symbols were discussed with the Indonesian side (BAKOSURTANAL) and agreed as the attached minutes. (See Appendix 2-(1) and 2-(2) Appendix-C.)

Fig. 3 Plan of Field Identification



▨ — Field reconnaissance area

5.4 Field completion

As the result of plotting and compilation conducted based on the results of the field identification, the field completion work was decided to carry out surveys on the following items:

1. Administrative Boundary (PROPINSI boundary, KABUPATEN boundary, KECAMATAN boundary).
2. Administrative Name (PROPINSI name, KABUPATEN name, KECAMATAN name, DESA name, KAMPUNG name).
3. Geographical Names (name of mountains, rivers, etc.)
4. Questions at the compilation work (foot path connecting the villages, selection of the temporary house in farm land).
5. Contents of the Compiled manuscripts (errata, ommision, expression, etc.).
6. Discussion with BAKOSURTANAL on scribing and printing.

Outline of the above work is as follows:

(1) Administrative Boundary

Three parties (one Japanese staff and one Indonesian staff per party) was sent to three Provinces (South Kalimantan, Central Kalimantan and East Kalimantan) and had the Governors of the Provinces Plotted boundaries on the copies of the compilation manuscripts and received the official seals and signatures on them.

On January 30, Japan-Indonesia Joint Meeting was held at Tabalong Governor Office of South Kalimantan (Tanjung) for discussing and confirming administrative boundary.

On February 5, Japan-Indonesia Joint Meeting was held at the Provincial Government Office of South Kalimantan (Banjar-masin) for discussing the matter of administrative boundaries of the three Provinces. The boundaries plotted on the copies of the compilation manuscripts provided by the Governors were checked at the meeting and were found that about 70 percent of them did not conform to reality.

Further discussion was made, however, it was difficult to confirm the boundaries. Japanese side hoped to bring the matter to an end but by a strong request of Indonesian side, it was decided that by the middle of April, boundaries would be plotted on the compilation manuscript copies by Indonesian side and those copies would be sent to Jakarta Office of JICA by the middle of May without fail. Both Japanese and Indonesian side agreed and noted the above matters.

(2) Administrative Names and Geographical Names

The compilation manuscript copies which contained the information obtained in the field identification had been thoroughly checked by the Indonesian side. The copies were handed over to the heads of towns through the Governors for check for seven days. On those copies, roads and bridges were colored by color pencils and the names collected at the field identification were underlined. Those treatment had been done for easy reading and checking by the Indonesian side.

As the result, a certain number of names were newly added. However, on rivers and mountains in the Northern forestry area, only a few names could be added, because there were virgin

jungle area and the available map was the only one which was made about forty years ago with the scale of 1/250,000.

Geographical name lists were checked by the counterpart (the Ministry of Public Works, Banjarmasin) and BAKOSURTANAL. Each list had their signature for approval.

(3) As to the compilation, questions were raised regarding huts scattered in the rice field and farm and pathes. The huts in the rice field were very small sized and used as a warehouse for agricultural tools. Usually no one lived in there except for a week or so in the busy season. There are also no foot path to the huts. Those in the farm were used for almost the same purpose as ones in the rice field, but, the size was little bigger and had foot pathes to the huts. About 10 percent of them were occupied.

Therefore, all of those huts were erased except for some of those in the farm which were left considering layout of the map.

The pathes were plotted with the utmost care at compilation, however, the area was covered by rubber plantation and forest and the pathes under the tree could not be plotted. In spite of every effort paid to plot the pathes which connected with villages, only a part of such pathes could be connected on the map. This problem was discussed with the Indonesian side and was agreed as unavoidable.

(4) New highway connecting Tanjung and Murungpudak was plotted by the plane table survey. This highway was constructed after the photography in the first year work and the plotting of it was realized by the strong request of the Indonesian side.

(5) Detailed discussion was held on scribing and printing with BAKOSURTANAL. (See Appendix 2-(2) Appendix 7).

5-5 Organization of survey team

The field work were conducted by three parties, respectively. The followings are the organization of a party.

For pricking and identification:

Japanese surveyor:	2
Counterpart	: 1
Labor	: 3 for pricking
	: 1 for field identification
Driver	: 1
Vehicle	: 1

For field completion:

Japanese surveyor:	1
Counterpart	: 1
Labor	: 1
Driver	: 1
Vehicle	: 1

5-6 Result of field work

5-6-1 Pricking

Pricking of bench marks were executed smoothly, because the leveling routes had been covered by aerial photographs taken in the first year work. Most of the bench mark monuments, temporary bench marks, indirect leveling points, which were covered by the first year work, had not been lost or damaged and the pricking work was possible more than planned.

Regarding NNSS Observation point pricking, photographing of the point (D-A609) was done in the second year work. By checking of the 5-time enlarged photograph, it was confirmed that the signal could not be seen but by referring of the signal description note, the eccentric point (house) was clearly taken in a photograph. Therefore, the pricking was made in the office by the staff, who were in charge of setting signal and eccentric survey in the first year work. The final result of the bench mark pricking was carried back to Japan on August 11, 1984 by the Leader of the Team. The result of NNSS observation point was also carried back on September 4, 1984 by Team members.

5-6-2 Field identification

When the field identification was executed, it was still in the rainy season. The road conditions were bad and the team faced with the difficulties to enter into the mountaneous area. Thus most of the data collected at the field work had no information such as scale or topographic features and could not be of any help to accurately plot the administrative

boundaries, geographical names, etc. on the photographs. This problem was discussed with BAKOSURTANAL and re-survey was decided to be executed during the period of field completion.

The field work was executed for 578 km² along the major roads. To the rest of the project area, the photo interpretation was made based on the criteria obtained in the field.

For the Northern mountainous area covered by the second year work, photo interpretation was executed in Japan after the survey team returned to home.

A special treatment was taken to the rubber plantations. Theoretically, they should be adopted as the plantation, however, there were very few well-kept plantation and most of them became mixed forests with miscellaneous trees. As the result of the discussion with BAKOSURTANAL on this matter, they were finally classified as the plantation due to the reason that they had been plantation when they were established.

In spite of every effort done at the field identification to confirm and plot the pathes and rivers in the rubber plantation and the forest, a large part of them could not be identified. Therefore, they were arranged to be plotted at the detail plotting process in Japan and an instruction was given to the operators to plot as much interpretable part as possible using a plotting instrument.

5-6-3 Field completion

In spite of the rainy season, rainfall was less than expected. However, the road conditions became worse year by year.

a. A survey on the administrative boundaries was the main work in the field completion as mentioned in the Paragraph 5-4. Planning and preparation sufficient to carry out the above work had been made by the survey team. The compilation manuscript copies had been handed over to the Indonesian side beforehand for getting their cooperation in identifying the boundaries. However, as the result, the boundaries could not be determined. Main reasons were, an agreement on the boundaries had not been concluded among the neighboring Provinces and there were not any map on the boundary even in the case that the boundary agreement had been concluded.

In this regard, the followings were decided as the result of meetings held on February 5, 1985 at the Provincial Government Office of South Kalimantan in Banjarmasin with Indonesian side (parties from East Kalimantan Province were absent), and of February 14, 1985 at the Ministry of Public Works (DPU) in Jakarta with Indonesian side including parties from East Kalimantan Province.

- 1) Those three Provinces (South Kalimantan, Central Kalimantan and East Kalimantan) shall plot the boundaries on the compilation manuscript copies and deliver them to DPU, Banjarmasin by the end of April.
- 2) DPU, Banjarmasin shall immediately delivery the said data to DPU, Jakarta, and DPU, Jakarta shall transfer them onto BAKOSURTANAL.
- 3) BAKOSURTANAL shall transfer the boundaries data onto another stable copy of the compilation manuscripts accurately and faithfully. However, in case if the boundary was not

determined, it was decided to transfer the boundary from the existing map (scale 1:250,000) by the authority of BAKOSURTANAL onto the print to prevent omission, gap and discrepancy.

4) The completed data on the boundary should be delivered to Jakarta Office of JICA by May 15, 1985. The Japanese side has noted that in case if the above-mentioned matters are not carried out, the Japanese side will have no responsibility for plotting the boundary on the topographic map in problem. Besides the provincial boundaries, the other boundaries (KABUPATEN, KECAMATAN) have already been determined except for a part of them.

b. It was found that the huts scattered in the rice field and the farm were for temporary use and were almost empty. In order to unify the expression on the map, only some of them were selected considering a balance with the neighboring villages.

c. For the densely populated area, originally only Tanjung and the residential area of PERTAMINA in MURUNGPUK were applied. However, in compliance with the request by BAKOSURTANAL, other towns indicated by BAKOSURTANAL were added.

d. Regarding the paths which were disconnected on the compilation manuscript copies, an approval was obtained from the Indonesian side.