

No 011

STUDY REPORT  
ON  
THE PROJECT FOR THE IMPROVEMENT OF  
EQUIPMENT FOR IRRIGATION IN  
EASTERN INDONESIA  
IN THE REPUBLIC OF INDONESIA

JICA LIBRARY



J 1136216 (7)

MARCH 1997

JAPAN INTERNATIONAL COOPERATION AGENCY

GRO

97-056

118  
33  
RO



1136216(7)

## PREFACE

In response to a request from the Government of the Republic of Indonesia, the Government of Japan decided to conduct a basic design study on the Project for the Improvement of Equipment for Irrigation in Eastern Area and entrusted the Japan International Cooperation Agency ( JICA ) to conduct the study with the assistance of the Japan International Cooperation System ( JICS ).

JICA sent to Indonesia a study team from the 14th October to the 2nd November,1996.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

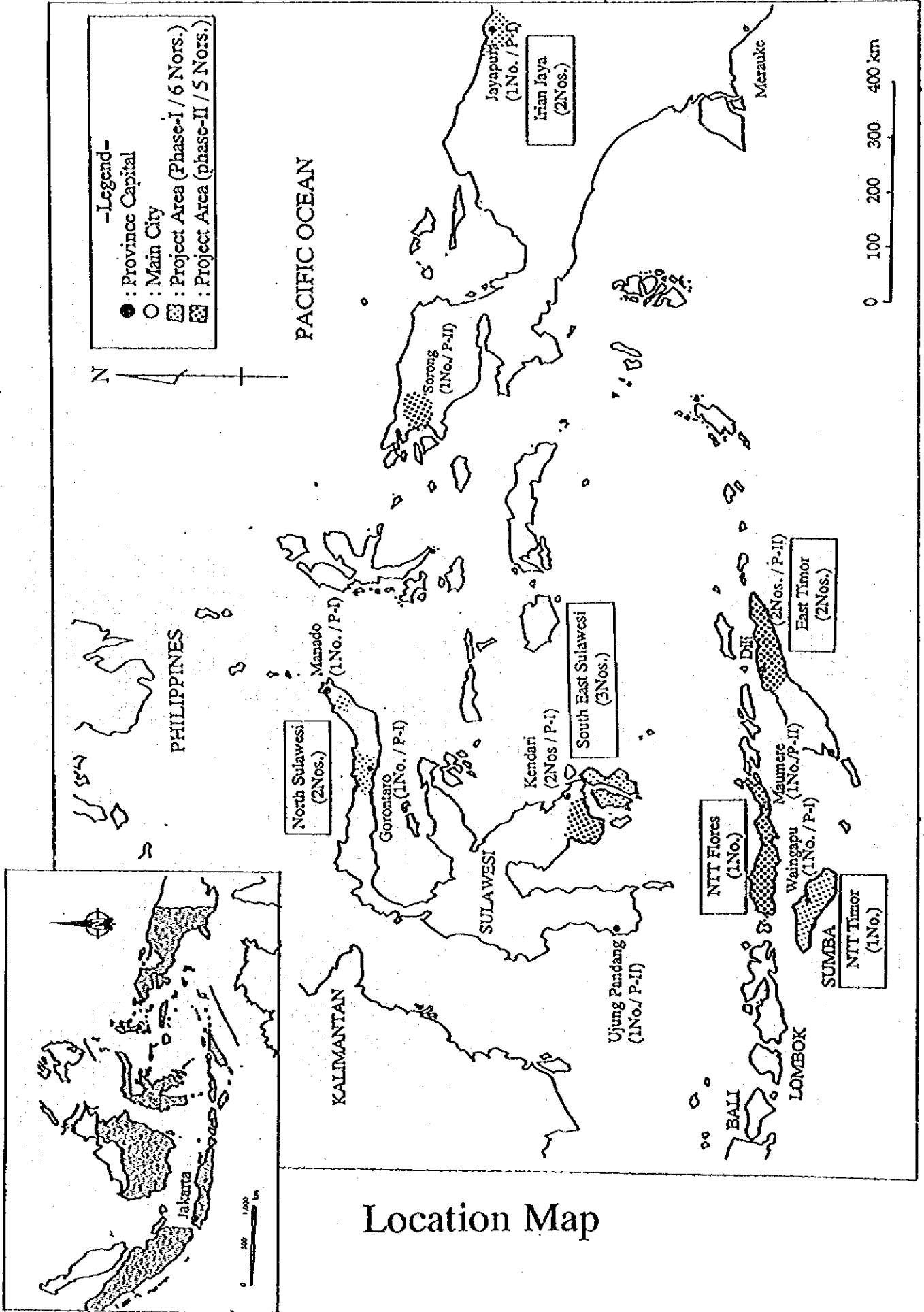
I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Indonesia for their close cooperation extended to the team.

MARCH 1997

Kimio Fujita

President

Japan International Cooperation Agency



## Table of Contents

Location Map

	page
<b>Chapter 1      Background of the Project</b>	1
<b>Chapter 2      Contents of the Project</b>	2
2-1    Objectives of the Project	2
2-2    Basic Concept of the Project	3
2-3    Basic Design	3
2-3-1 Design Concept	3
2-3-2 Basic Design	5
<b>Chapter 3      Implementation Plan</b>	7
3-1    Implementation Plan	7
3-1-1 Implementation Schedule	7
3-1-2 Obligations of recipient country	9
3-2    Operation and Maintenance Plan	9
<b>Chapter 4      Project Evaluation and Recommendation</b>	12
4-1    Project Effect	12
4-2    Recommendation	13
<b>Appendices</b>	
1. Member List of the Survey Team	
2. Survey Schedule	
3. List of Party Concerned in the Recipient Country	
4. Minutes of Discussion	

## Chapter 1. Background of The Project

The Government of the Republic of Indonesia (simply referred to as Indonesia below) recognizes a stable food supply as the most important agricultural policy and has promoted irrigation projects since its establishment in 1969. Especially, groundwater irrigation projects improved local agriculture dramatically and self-sufficiency of rice production was achieved in 1984, which was the prime target of the Five-year National Development Plan (REPELITA-I-III 1969-1983). However, high-yield rice is widely cultivated since the latter half of 1980's, so the increase rate of the yield per unit area slows down. In addition, lands suitable for farming are being diverted for industrial applications, so rice production is stagnating. In addition, the demand for food is increasing rapidly due to high population growth, rice production is now unstable. The demands for agricultural products are diversifying and the demand for fodder is increasing due to changes in the dietary habits of the people with high economic growth. Therefore, the Sixth Five-year Plan (REPELITA-VI 1994-1998) is intended to increase rice production for self-sufficiency of the principal food and promote production of other crops, such as beans, corns, and potatoes.

Since the Government of Indonesia did not have sufficient funds, other countries and international agencies assisted the groundwater development projects by providing drilling rigs. After Indonesia achieved self-sufficiency of rice production, Japan mainly provided drilling rigs through its 2KR assistance. However, the drilling rigs were excluded from the scope of the 2KR assistance after 1995, and Indonesia requested for ones through a general grant aid.

It is one of the important targets of the Sixth Five-year Plan to eliminate poverty in the eastern area of Indonesia, which is the scope of this project. Since this region is mostly a semi-dry area and the dry season is long, supplementation of rainwater-dependent agriculture is an important national task. Therefore, this project is intended to place eleven new drilling rigs in the area to which

higher priority for groundwater irrigation is given to dig wells together with the existing nine drilling rigs and irrigate a total farm land of about 30,000 hectares (ha).

## **Chapter 2. Contents of The Project**

### **2-1 Objectives of The Project**

#### **(1) Background**

There are nine drilling rigs in the eastern area of Indonesia, which is the scope of this project. Additional eleven drilling rigs are required to achieve the goal of the Sixth Five-year Plan for the area to implement groundwater development for the farm land of 30,000 ha.

Although the budget required for the groundwater irrigation projects depends on foreign currency (loan), the Government of Indonesia constructed 613 wells in the project area. However, it is not possible to irrigate the target area with the limited number of drilling rigs. There is a limit on effective use of the limited number of machinery in the large project area due to some problems, such as transportation costs. Indonesian islands are large and transportation in an island is not always easy. It is therefore required to place a drilling rig in each project site to achieve the groundwater irrigation plan.

#### **(2) Purpose**

The purpose of this project is to procure well drilling rigs required to implement irrigation agriculture using groundwater at the six project sites in the five provinces in the eastern area of Indonesia.

The project area has a rainy season and a dry season, and agriculture is now performed only in the rainy season using rainwater. Therefore, the agricultural production depends largely on the amount of rain. It is difficult to use surface water in the project area for geographical and geological

reasons, and ground water must be used for living and agriculture. Irrigation agriculture in the dry season is indispensable for increasing food production and farmers' incomes and it is one of the important national policies.

## 2-2 Basic Concept of The Project

This project procures 11 well drilling rigs and other equipments required to irrigate a total area of about 30,000ha in five provinces in the undeveloped eastern area of Indonesia to increase agricultural production and incomes of farmers in the dry season.

## 2-3 Basic Design

### 2-3-1 Design Concept

#### (1) Social conditions

The most underdeveloped provinces, Irian Jaya, East Timor and NTT Timor, are included in the scope of this project.

#### (2) Construction

The equipment and materials for well drilling (casing pipes, screen pipes, cement, bentonite, etc.) and for building irrigation facilities (cement, reinforcing bars, galvanized sheets, power generators and pumps) can be locally procured. The facilities can be constructed by the local subcontractors determined by bidding as staff of the (G.W.D.P) Groundwater Development.

#### (3) Technical guidance

There is no problem concerning maintenance and management of the facilities after completion. However, technical guidance is necessary regarding the equipment, such as maintenance and inspection, log, and spare parts inventory control, in the aspects of both software and hardware. Therefore, manufacturers and consultants must provide technical guidance in East Timor where there is no drilling rig to give operating instructions of the equipment and improve the maintenance and management



skills of workers.

(4) Equipment scope, etc.

All tractor mounted drilling rigs are procured by considering the geography of Indonesia, the accessibility to each project site, and mobility.

Since the road conditions worsen in the rainy season and there are many wooden bridges with unknown load capacities in the project area, it is the best to procure light-weight (lower than 10 tons) tractor mounted drilling rigs whose drilling unit can be separated from the mud pump. Two types of drilling rigs are procured: one that drills 300m for Irian Jaya and the other that drills 150m for other provinces.

(5) Equipment transportation

Since the equipment can clear customs at a local port close to each project site, the Japanese side is responsible for transporting equipment to the port. The Indonesian side is responsible for transporting it from the port to the site after customs clearance.

The project sites and ports are summarized in Table 2-1.

Table 2-1 Overview of local ports

Area name	Site name	Port name	Remarks
1.NTT Flores	Flores island	Maumere	Middle-sized ships can enter the port
2.NTT Timor	Sumba island	Waingapu	Middle-sized ships can enter the port
3.East Timor	East Timor	Dili	Large ships can enter the port
4.North Sulawesi	Tondando	Bitung	Large ships can enter the port
	Gorontaro	Gorontaro	Middle-sized ships can enter the port
5.South East Sulawesi	Buton	Kendari	Large ships can enter the port
6.Irian Jaya	Jayapura	Jayapura	Large ships can enter the port
	Sorong	Sorong	Large ships can enter the port

(6) Construction period, etc.

Since it takes about six months to manufacture the main equipment, the bidding for phase-I must end by July, 1997. It is expected to take about two months for marine transportation and customs clearance. The equipment is delivered in March 1998. Phase-II has a similar schedule.

2-3-2 Basic Design

Currently, there are nine drilling rigs in the project area. One is used to drill about ten wells per year. One well can irrigate a farm land of about 10 ha. If a total of 20 old and new drilling rigs are used, 200 wells can be drilled per year. They correspond to an irrigation area of about 2,000 ha. The basic plan for arranging drilling rigs is as follows:

Since the average well depth in the Irian Jaya province is 250m and the aquifer depth is 150 to 230m, two drilling rigs (type A) that can dig 300m are allocated to this province. Since the average well depth in the other provinces is 100 to 150m and the aquifer depth is 70 to 130m, nine drilling rigs (type B) that can dig 150 m are allocated to these provinces.

The tractor mounted drilling rigs must be procured due to poor accessibility to the sites. Air compressors of types A (300m) and B (150m) are procured according to the abilities of drilling rigs. The mud pump is towed by a truck with a crane, and the truck capacity is 3.5tons by considering the casing installation. The groundwater detector that can measure 300 m are procured. Since even a local agent for a manufacturer does not have enough stock of spare parts and spare parts cannot be obtained easily because the project area is far away from Jakarta, spare parts that correspond to 10% of the main unit price are procured.

This project is divided into two phases in consideration of their budget preparation. The plan for division is given in Table 2-2.

Table 2-2 Phases for procuring equipment

Area name	Phase I	Phase II	Total
NTP Flores	0	1	1
NTP Timor	1	0	1
East Timor	0	2	2
North Sulawesi	2	0	2
South East Sulawesi	2	1	3
Irian Jaya	1	1	2
Total	6	5	11

The purposes, specifications and quantities of the main equipment requested by Indonesia are as follows (see Table 2-3).

Table 2-3 Contents of requested equipment

Equipment	Specification	Quantity	Purpose
1. Drilling rig	Tractor mounted type	11	Well drilling
1-1 Type-A	Top head drive rotary type Drilling capacity: 300m	(2)	Well drilling in Irian Jaya
1-2 Type-B	Top head drive rotary type Drilling capacity: 150m	(9)	Well drilling in other provinces
2. Mud pump	Trailer mounted type Displacement: 1,050 l or more Pressure: 24kg/cm <sup>2</sup> or more	11	Borehole wall protective agent (bentonite) during well drilling
3. Air compressor	Rotary screw hydraulic type	11	Well cleaning
3-1 Type A	Displacement: 17/m <sup>3</sup> or more	(2)	Well finishing and cleaning in Irian Jaya provinces
3-2 Type B	Displacement: 15/m <sup>3</sup> or more	(9)	Well finishing and cleaning in other provinces
4. Well logging equipment	Specific resistance, natural potential Gamma detector Cable length: 300m	11	Aquifer judgment and casing program creation
5. Truck with crane	3.5-ton crane 5-ton truck	11	Equipment transportation

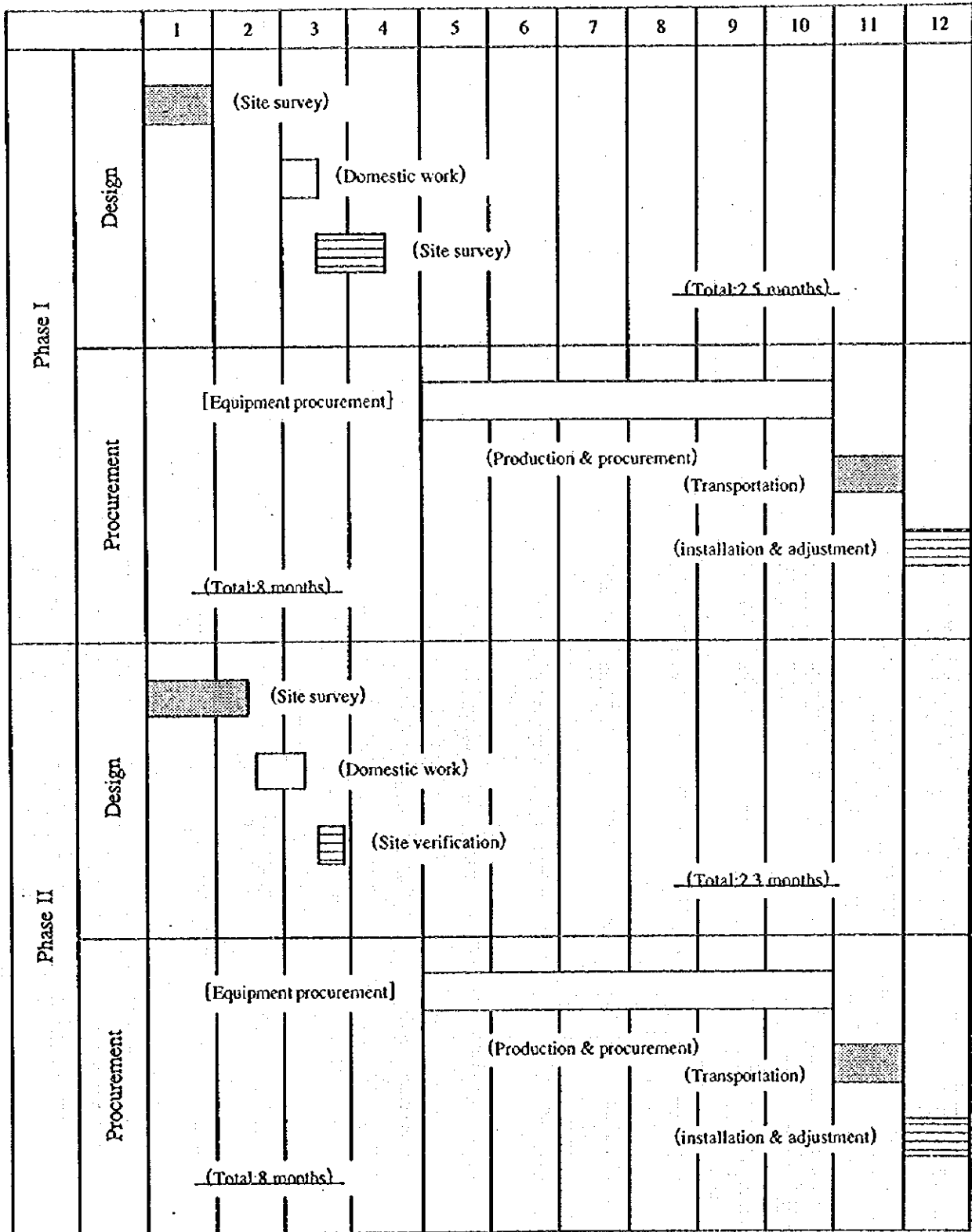
## Chapter 3. Implementation Plan

### 3-1 Implementation Plan

#### 3-1-1 Implementation Plan

The schedule of this project is given in Table 3-1.

Table 3-1 Implementation Plan



### 3-1-2 Obligations of the recipient country

The Republic of Indonesia must carry out the works required to implement the project through the Japan's Grant Aid Program. The required works are listed below.

- 1) Pay the costs of inland transportation to each site after customs clearance.
- 2) Bear the banking expenses based on bank transactions.
- 3) Pay taxes imposed on equipment imported for use in the project and go through customs clearance formalities.
- 4) Permit Japanese project staff to enter and stay in Indonesia.
- 5) Set up a responsible organization for the project during its implementation and after its completion and appoint its staff.
- 6) Prepare a budget for the responsible organization for the project during its implementation and after its completion.
- 7) Pay all expenses other than the expenses required to build facilities and purchase, transport, and install equipment through the Grant Aid Program.

### 3-2 Operation and Maintenance Plan

#### (1) Equipment

The existing drilling rigs and related equipment are kept in the Groundwater Development Project of each province. They are lent to the private digging companies that win for the project under the following conditions:

- 1) They must bear the expense of operating the equipment.
- 2) They must bear the expense of daily inspection and maintenance.
- 3) They must bear the expense of replacing parts, maintaining and servicing the equipment at the end of the lending period.
- 4) They must submit operating and maintenance records to

the Groundwater Development Project every month.

- 5) They must service the equipment to the original condition and return it to the Groundwater Development Project.

Therefore, the Groundwater Development Project of each province does not have a budget for equipment maintenance costs. However, major repairs, such as overhaul, which go beyond the capabilities of the private companies and Groundwater Development Project, are performed at the workshop located in Surabaya, East Java Province.

The budget for the workshop in 1996 is given in Table 4-1. The whole budget is 697,176,000 Rp (about ¥35 million). The expense of equipment repair and spare parts procurement is 273,304,000 Rp (about ¥13,660,000), which accounts for about 40% of the whole budget. This budget is sufficient for major repairs of the equipment by considering the personnel expenses and prices of parts in Indonesia.

Table 3-2 Budget of The Workshop in East Area (Surabaya) (1996)

Item	Budget (1,000Rp)	Percent (%)
1. Office expense	211,939	30.4
2. Office facility expense	65,450	9.4
3. Salary/allowance	129,906	18.6
4. Custom duty, etc.	8,290	1.2
5. Traveling expense	8,290	1.2
6. Heavy machinery maintenance cost	44,120	6.3
7. Spare parts	3,000	0.4
8. Equipment modification cost	226,184	32.5
Total	697,176	100.0

## (2) Facilities

Each Groundwater Development Project has a budget for the facility maintenance and management expense which accounts for 5% of its whole budget. This budget is increasing almost every year as the number of facilities increases. The major items of

the facility maintenance and management expense are education/training of farmers for management and maintenance, operator expense, and pump and fuel expense. The Groundwater Development Project pays the pump operator expense for two years after completion of construction of the facility (20,000 to 30,000 Rp/month). Then, each irrigation association (normally, 10 to 20 households) pays charges according to the amount of water used to bear the pump operator expense. Since water lifts by itself in most wells in the Irian Jaya Province (without need to pump up well water), the maintenance and management expense is not included in the budget.

The facility maintenance and management expense is shown in Table 3-3.

Table 3-3 Maintenance and management expense in each  
Groundwater Development Project

Unit:1000 Rp

	1991	1992	1993	1994	1995	1996	Total
NPT Flores	-	-	-	20,600	70,279	55,080	145,959
NPT Timor	-	-	10,000	10,000	12,000	4,000	36,000
East Timor	0	32,959	38,250	45,385	57,859	53,203	227,656
South East Sulawesi	-	8,909	33,174	48,800	46,966	153,396	291,245
North Sulawesi	-	-	-	11,160	64,320	48,300	123,780
Irian Jaya	0	0	0	0	0	0	0
Total	0	41,868	81,424	135,945	251,424	313,979	824,640



## Chapter 4. Project Evaluation and Recommendations

### 4-1 Project Effects

The project has the following effects:

(1) Transition from rainwater-dependent agriculture to irrigation agriculture

The annual precipitation at the project site varied greatly in nine years 1981 to 1989 as shown in Table 2-4. Especially, the maximum precipitation is about three times higher than the minimum precipitation in East Timor and South East Sulawesi. If the annual precipitation is 500 mm or less, agriculture is generally difficult. The annual precipitation in East Timor and South East Sulawesi was lower than 500 mm in two years in the period of 1981 to 1989. The precipitation is also low in NTT Timor.

The agricultural production changes largely according to the amount of rain in areas where it varies greatly from year to year. Therefore, groundwater irrigation is an indispensable means in the project area to stabilize agricultural production without depending on rainwater and increase food production by double or triple cropping.

(2) Improvement of agricultural productivity and stabilization of living

Most farmers in the groundwater development project areas of the five provinces, such as Irian Jaya, North Sulawesi, and South East Sulawesi, are immigrants from the Bali and Java islands and others (they immigrated 10 to 20 years ago). Normally, a farm land of 2 ha is given to each immigrant farmer. According to inquiries in each province, they grow crops once a year with rainwater in the rainy season and the rice yield (unhulled) is 2.0 to 2.5 tons per ha. The price of unhulled rice sold from farmers to brokers is 350 to 400 Rp/kg. The annual income of a farmer is one million Rp at the maximum. However, the pure income is 500,000 Rp (about ¥25,000) because

the expenses of agricultural equipment and workers are subtracted. It is a fact that most farmers supplement their regular income by doing work on a daily wage in public works. Alternatively, they raise vegetables, peanuts, beans, corns, etc. using rainwater in some regions in the dry season to gain a side income. When one pump is lent from a private firm, 400kg/ha of rice must be paid to it, and the annual pure income is 200,000 to 300,000Rp (¥10,000 to ¥15,000).

If groundwater irrigation is made possible by this project, rice can be raised twice a year and other crops, such as corns, can be raised stably regardless of rainwater. In this case, the income from rice is about 1,000,000Rp and the income from corn is about 500,000Rp (average 1.0 ton/ha, 200 to 250Rp/kg, farm area 2.0 ha/farmer), and the total income per farmer is 1,500,000Rp (about ¥75,000). Although the expenses are subtracted from the income, the income increases by at least ¥30,000, contributing to doubling or tripling the annual income.

### (3) Drilling more wells by reducing unit cost of work

Currently, the Groundwater Development Project lacks equipment and personnel and uses private drilling companies. However, if 11 drilling rigs are procured, the expense paid to private firms can be saved by reducing the unit cost of work and allocating persons optimally, and the money can be used to drill more wells.

## 4-2 Recommendations

The recommendations for this project are as follows.

### (1) Budget

The site survey for the project revealed that the budget for well drilling work by the Indonesian Ministry of Public Works is the most important point in this issue. If a sufficient budget is secured by foreign currency (loan) and domestic

currency, the groundwater irrigation project can be carried out as scheduled. It is therefore necessary to see whether the Indonesian side secures the budget for the project or not.

(2) Movement of engineers

The Indonesian side is considering to use equipment effectively by moving engineers from the Java island to the project area where engineers are not sufficient. However, it is necessary to check whether the engineers can be used smoothly.

(3) Effective use of equipment

Submission of operating records of all equipment procured by the Japanese side must be obliged and the equipment needs to be used effectively and managed.

(4) Workshop building

In East Timor and NTT Flores, workshops in which the procured equipment and spare parts are stored and repaired are not sufficient. The Indonesian side needs to build workshops.

## Appendices 1 Member List of the Survey Team

### 1. Leader

Mr. Takeshi Hiramatsu :

Grant Aid Division, Economic Cooperation Bureau, Ministry of  
Foreign Affairs

### 2. Project Coordinator

Ms. Maki Maruyama :

1st Study Division, Grant Aid Study & Design Department, Japan  
International Cooperation Agency (JICA)

### 3. Equipment and procurement planning 1

(equipment planner)

Mr. Kiyofumi Nakauchi :

Director, Planning and Survey Division, Grant Aid Management  
Department, Japan International Cooperation Agency (JICA)

### 4. Equipment and procurement planning 2

(Groundwater development 1)

Mr. Mitsuro Uemura :

Deputy Director, Planning and Survey Division, Grant Aid  
Management Department, Japan International Cooperation Agency  
(JICA)

### 5. Equipment and procurement planning 3

(Groundwater development 2)

Mr. Chifumi Yamashita :

Planning and Survey Division, Grant Aid Management Department,  
Japan International Cooperation Agency (JICA)

## Appendices 2 Survey Schedule

Survey Schedule for Irrigation Equipment Procurement Plan for The Eastern Part of Indonesia (Hiramatsu, Maruyama, and Uemura)

No.	Date	-	Travel	Itinerary	Stay
1	Oct.14	Mon.	Narita or Jakarta	Travel JL725 (10:50 to 16:00)	Jakarta
2	Oct.15	Tue.	Jakarta	Discussion with EOJ, JICA and Water Resources Department	Jakarta
3	Oct.16	Wed.	Jakarta	Discussion with Water Resources Department	Jakarta
4	Oct.17	Th.	Jayapura to Kupang	Travel MZ644 (06:05 to 11:40) Discussion	Kupang
5	Oct.18	Fri.	Kupang to Dili	Travel SG412 (14:50 to 15:35)	Dili
6	Oct.19	Sat.	Dili	Discussion, site survey	Dili
7	Oct.20	Sun.	Dili to Kupang	Travel SG413 (16:05 to 16:50)	Kupang
8	Oct.21	Mon.	Kupang to Maumere	Travel BC741 (07:00 to 08:00) Discussion	Maumere
9	Oct.22	Tue.	Maumere to Ujunpandang	Travel MZ6590 (09:00 to 11:00)	Ujunpandang
10	Oct.23	Wed.	Ujunpandang	Documentation	Ujunpandang
11	Oct.24	Th.	Ujunpandang to Manado	Travel GA740 (11:20 to 13:00) Discussion	Manado
12	Oct.25	Fri.	Manado to Kotamobagu	Site survey	Manado
13	Oct.26	Sat.	Manado	Discussion	Manado
14	Oct.27	Sun.	Manado	Documentation	Manado
15	Oct.28	Mon.	Manado to Jakarta	Travel GA741 (14:00 to 17:45)	Jakarta
16	Oct.29	Tue.	Jakarta	Discussion with EOJ, JICA and Water Resources Department	Jakarta
17	Oct.30	Wed.	Jakarta	Discussion with Water Resources Department	Jakarta
18	Oct.31	Th.	Jakarta	Discussion with Water Resourced Department, market research	Jakarta
19	Nov.1	Fri.	From Jakarta	Report to EOJ and JICA Travel JL726 (23:01→	Flight
20	Nov.2	Sat.	To Narita	→08:40)	

## Appendices 2

### Survey Schedule for Irrigation Equipment Procurement Plan for The Eastern Part of Indonesia (Nakauchi and Yamashita)

No.	Date	-	Travel	Itinerary	Stay
1	Oct.14	Mon.	Narita or Jakarta	Travel JL725 (10:50 to 16:00)	Jakarta
2	Oct.15	Tue.	Jakarta	Discussion, travel MZ760 (21:00→	Flight
3	Oct.16	Wed.	To Jayapura	→08:40), discussion, site survey	Jayapura
4	Oct.17	Th.	Jayapura	Site survey	Jayapura
5	Oct.18	Fri.	Jayapura	Site survey	Jayapura
6	Oct.19	Sat.	Jayapura to Ujunpandang	Travel MZ761 (11:10 to 14:40)	Ujunpandang
7	Oct.20	Sun.	Ujunpandang to Kendari	Travel MZ704 (09:05 to 09:55)	Kendari
8	Oct.21	Mon.	Kendari	Discussion, site survey	Kendari
9	Oct.22	Tue.	Kendari	Site survey	Kendari
10	Oct.23	Wed.	Kendari to Ujunpandang	Travel SG855 (10:30 to 11:20) Discussion	Ujunpandang
11	Oct.24	Th.	Ujunpandang to Manado	Travel GA740 (11:20 to 13:00) Discussion	Manado
12	Oct.25	Fri.	Manado to Gorontalo	Travel MZ7971 (07:00 to 07:40)	Gorontalo
13	Oct.26	Sat.	Gorontalo to Manado	Travel MZ7972 (06:00 to 06:40)	Manado
14	Oct.27	Sun.	Manado	Documentation	Manado
15	Oct.28	Mon.	Manado to Jakarta	Travel GA741 (14:00 to 17:45)	Jakarta
16	Oct.29	Tue.	Jakarta	Discussion with EOJ, JICA and Water Resources Department	Jakarta
17	Oct.30	Wed.	Jakarta	Discussion with Water Resources Department	Jakarta
18	Oct.31	Th.	Jakarta	Discussion with Water Resourced Department, market research	Jakarta
19	Nov.1	Fri.	From Jakarta	Report to EOJ and JICA Travel JL726 (23:01→	Flight
20	Nov.2	Sat.	To Narita	→08:40)	

### Appendices 3 List of Party Concerned in the Recipient Country

#### 1. Water Resources Department of Ministry of Public Works

Mr. HER WIRYANTO	Chief of Sub Directorate of Foreign Aid Administration
Mr. M. HASSAN	Sub Directorate of General Planning
Mr. WAHYU HARTONO	Directorate of Technical Guidance, DGWRD Chief of Sub Directorate of Ground Water
Mr. DJOKO SANTOSO	Chief of Eastern Region Section, Sub Directorate of Ground Water
Mr. BINSAR TAMBUNAN	Chief of Program Planning & Evaluation Section for Central Region, Sub Directorate of General Planning, DPP
Dr. SUTARDI	Directorate of Planning & Programming
Mr. MUDJIADI	Directorate of Planning & Programming
Mr. ROCHHADI	Chief of Section of Dissemination
Mr. GIOVANI WIYARTO	Directorate of Implementation East Region, Chief of Sub Directorate of East Region IV (NTB, NTT, TIM)
Mr. DASRIL RATHMAN	
Mr. SUHARTO	Directorate of Implementation East Region, Region I (North Sulawesi, Central Sulawesi)
Mrs. Lilik Retno	Staff of Sub Directorate of East Region IV (NTB, NTT, TIM)
Mr. Willy. A. F	Staff of Technical Guidance
Mr. Hiroshi Kudo	Colombo Plan Expert of JICA

#### 2. Planning Department of Ministry of Agriculture

Ms. MITRA WINDA TUNUS, M.SC	Chief of General-Planning
--------------------------------	---------------------------

#### 3. BAPPENAS

Ir. SAYID SUBCHAN	Bureau Chief of Water Resources & Irrigation, BAPPENAS
-------------------	--

Mr. BAMBANG ADINUGNOHO Staff of Bureau Chief of Water Resource & Irrigation, BAPPENAS

4. North Sulawesi Ministry of Public Works

Ir. J.O.KALIGIS MSC Chief of Subdinas of Water Resources Department, DINAS SULUT Regional Office

Ir. H.E.WALA DIPIHE Project Manager of PISU (Project of Irrigation SULUT)

Ir. E.M.SARAGIH BME Chief of Subdinas of Equipment

Mr. DJIDON WAPANIL BE Office Manager, P2AT (SULUT Groundwater Development Project Office)

Mr. SUGIARTO Drilling Engineer, P2AT

5. North Sulawesi Workshop Ministry of Public Works

Mr. ARMA ASLAH, BE Chief of Equipment Maintenance & Inventory, Public Works, SULUT Regional Office

6. Timor Groundwater Development Department of East Nusa Tenggara

Mr. KRISNO D. HERWANTOKO

MSc Chief of TIMOR Groundwater Development Project (GWDP)

Mr. SUBADINOTO Chief of Drilling Section of TIMOR GWDP

Mr. HARISUNSITO Chief of Water Management of TIMOR GWDP

Mr. IK SCMRDIDA Office Manager of TIMOR GWDP

Mr. SUMARDI Mechanical Staff, TIMOR GWDP

Mr. MARYONO BE Chief of Planning & Programming of TIMOR GWDP

Mr. TJAHJO HIDIYANYO Chief of FLORES GWDP

Mr. LENORA MANGKU Chief of Drilling Section of East TIMOR GWDP

Mr. HARIO SUMARNI Chief of East TIMOR GWDP

7. East Nusa Tenggara Water Resources Department of Ministry of Public Works



Mr. IR FRANKIE TAYU Kepala DINAS, Water Resources Department,  
Ministry of Public Works, NTT Regional  
Office

Mr. YHS.KATIPANA Kepala Sub DINAS, Water Resources  
Department, Ministry of Public Works, NTT  
Regional Office

8. East Nusa Tenggara Ministry of Public Works

Mr. TJAHO LODIYAHTO Chief of FLORES Groundwater Development  
Project (GWDP)

Mr. MCITALIB

Mr. TRIYOTNLUSS Drilling Section E&M

Mr. ASDIN JULAICDY Irrigation Section

Mr. KRISNO D.HERWANTOKO

MSc Chief of TIMOR Groundwater Development  
Project (GWDP)

9. South East Sulawesi Ministry of Public Works

Ir. AINUDDIN KADIR Chief of Subdinas of Water Resources  
Department DINAS SULUT Regional Office

10. South East Sulawesi Ministry of Public Works

Mr. KASIMAN MANURUUG Chief of KENDARI Groundwater Development  
Project (GWDP)

Mr. EQY SANUSI Irrigation Section

11. Irian Jaya Groundwater Development Department

Mr. AGUSK SIREGAR CES Project Manager

Mr. PANAL SIMANJUNTAK Sub Project Manager

Mr. SIGIT PURNOMO Deputy Ass (Geologist)

MINUTES OF DISCUSSIONS  
OF  
THE BASIC DESIGN STUDY ON THE PROJECT FOR  
THE SUSTAINABLE GROUNDWATER DEVELOPMENT FOR IRRIGATION  
IN  
EASTERN AREA OF THE REPUBLIC OF INDONESIA

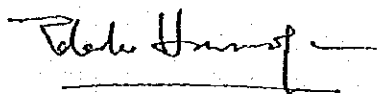
According to the result of the Preliminary Study, the Government of Japan decided to conduct a Basic Design Study on the Project for the Sustainable Groundwater Development for Irrigation in Eastern Area of the Republic of Indonesia (hereinafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Republic of the Indonesia a study team, which is headed by Mr. Takeshi HIRAMATSU, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign affairs, and was scheduled to stay in the country from October 14 to November 2, 1996.

The team held discussions with the officials concerned of the Government of Indonesia and conducted a field survey.

In the course of the discussions and field survey, both parties have confirmed the main items described on the attached sheets.

Jakarta, October 21, 1996

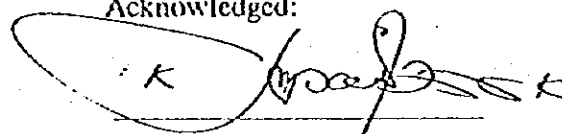


Mr. Takeshi HIRAMATSU  
Leader,  
The Study Team,  
JICA



Mr. SOEPARMONO  
Directorate General of Water  
Resources Development (DGWRD).  
Ministry of Public Works

Acknowledged:



Mr. Koensatwanto Inpasihardjo  
Head, Bureau for Water Resources  
and Irrigation,  
The National Development Planning Agency  
(BAPPENAS)

## ATTACHMENT

### 1. Objective

The objective of the Project is to provide adequate quantity of drilling rigs to develop groundwater for irrigation and domestic water supply in Eastern Area of Indonesia for sustainable food production, alleviating poverty as well as improving living condition.

### 2. Project Sites

The Project sites are located in the provinces of East Nusa Tenggara, East Timor, North Sulawesi, South East Sulawesi and Irian Jaya.

### 3. Responsible and Executing Agency

Responsible Agency is Ministry of Public Works and Executing Agency is the Directorate General of Water Resources Development, Ministry of Public Works (hereinafter referred to as "DGWRD").

The following Project Offices are in charge of construction of wells and irrigation facilities.

- a) East Nusa Tenggara Groundwater Development Project offices in Kupang and Maumere (Flores),
- b) East Timor Groundwater Development Project office in Dili,
- c) North Sulawesi Groundwater Development Project office in Kotamobagu,
- d) South East Sulawesi Groundwater Development Project office in Kendari, and
- e) Irian Jaya Water Resources Development and Conservation Project Office in Merauke.

### 4. Items requested by the Government of Indonesia

After a series of discussions with the Basic Design Study Team, the items shown in ANNEX-1 were requested by the Government of Indonesia (the Indonesian side made additional request for the Pumping Test Equipment and the Water Tank Lorry). The quantity of each item will be decided after further studies in Indonesia and Japan.

### 5. Japan's Grant Aid System

- 5-1 The Government of Indonesia has understood the system of Japan's Grant Aid on ANNEX-2 as explained by the Team.
- 5-2 The Government of Indonesia will take the necessary measures described in ANNEX-3 for the smooth implementation of the Project, on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

### 6. Schedule of the Study

- 6-1 The members of the Team will conduct further studies in Indonesia until November 2, 1996.
- 6-2 JICA will complete the final summary report and send it to the Government of Indonesia around December, 1996.

## 7. Other Relevant Issues

7-1 Both sides confirmed the priority of the distribution of equipment as follows;

	Province	Priority
1	East Timor	A
2	East Nusa Tenggara	A
3	North Sulawesi	A
4	South East Sulawesi	B
5	Irian Jaya	B

7-2 Both sides have recognized the necessity of the technical training for operation and maintenance of the procured equipment after handling over. The Indonesian side will decide a location of the training before the detail design.

7-3 With regards East Timor, both sides confirmed that the Indonesian side will allocate adequate staff for the drilling works before commencement of the Project.

7-4 The Government of Indonesia will allocate the budget to ensure all the expenses for handling and inland transportation of the equipment procured under this Project. The Study team, furthermore, strongly requested to Indonesian side to ensure the budget for operation and maintenance of the equipment as well as drilling wells and irrigation facilities construction costs.

7-5 Indonesian side stated that they will submit to JICA Indonesia office annual operation reports of drilling equipment procured under this Project.

## ANNEX-1

## List of requested Item

No.	Name of Goods	Quantity	Remarks
1	Tractor mounted Drilling Rig (including drilling accessories and tools)	11 units	
2	Trailer mounted Mud Pump (including pump accessories and tools)	11 units	
3	Surface casing (Conductor casing pipe)	11 units	
4	Cargo Truck with Crane	11 units	
5	Electrical Prospecting Equipment	7 units	*1
6	Electrical Logging Test Equipment	11 units	
7	Air Compressor	11 units	
8	Pumping Test Equipment	11 units	Additional request
9	Water Tank Lory	11 units	Additional request

\*1 One unit each for East Timor , North Sulawesi, South East Sulawesi and two units each for East Nusa Tenggara, Irian Jaya.

\*2 Both sides reconfirmed Indonesian Side will prepare the other equipment necessary for drilling work.

## ANNEX-2

### Japan's Grant Aid Scheme

#### 1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	( Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraise the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the result are then submitted to the Cabinet for approval.

Fourthly, the Project, once approved by the Cabinet, with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the Project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

## 2. Basic Design Study

### 1) Contents of the Study

The aim of the Basic Design Study, conducted by JICA on a requested project is to provide basic document necessary for the appraisal of the project by the Japanese Government. The contents of the Study are as follows:

- a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the project's implementation.
- b) Evaluation of the appropriateness of the project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- c) Confirmation of items agreed on by both parties concerning the basic concept of the project.
- d) Preparation of a basic design of the Project
- e) Estimation of the costs of the Project

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid Project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations in the recipient country through the Minutes of Discussions.

### 2) Selection of Consultants

For the smooth implementation of the study, JICA uses (a) registered consultant firm(s). JICA selects (a) firms(s) based on proposals submitted by interested firms. The firm(s) selected carry (ies) out the Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

It is important that the recipient country should make a contract promptly with the same consulting firm(s) used for the Basic Design Study which is (are) recommended by JICA, in order to maintain technical consistency and also avoid the undue delay in implementation of the project under the single fiscal year system of Japan's Grant Aid.

*Handwritten initials/signature*

### 3. Japan's Grant Aid Scheme

#### 1) What is Grant Aid ?

The Grant Aid Program provides a recipient country with non-reimbursable funds needed to procure the facilities, equipments and services (engineering services and transportation of the products, etc.) for economic and social development the country under the principals in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

#### 2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes Exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant, etc., are confirmed.

#### 3) "The period of the Grant" means the one fiscal year in which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.

However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

#### 4) Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When both Governments deem it necessary, the Grant may be used for the purchase of the products or services of the third country.

However the prime contractors, namely, consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)



5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of recipient country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:

- (1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
- (2) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
- (3) To secure buildings prior to the procurement in case the installation of the equipment.
- (4) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant.
- (5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
- (6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

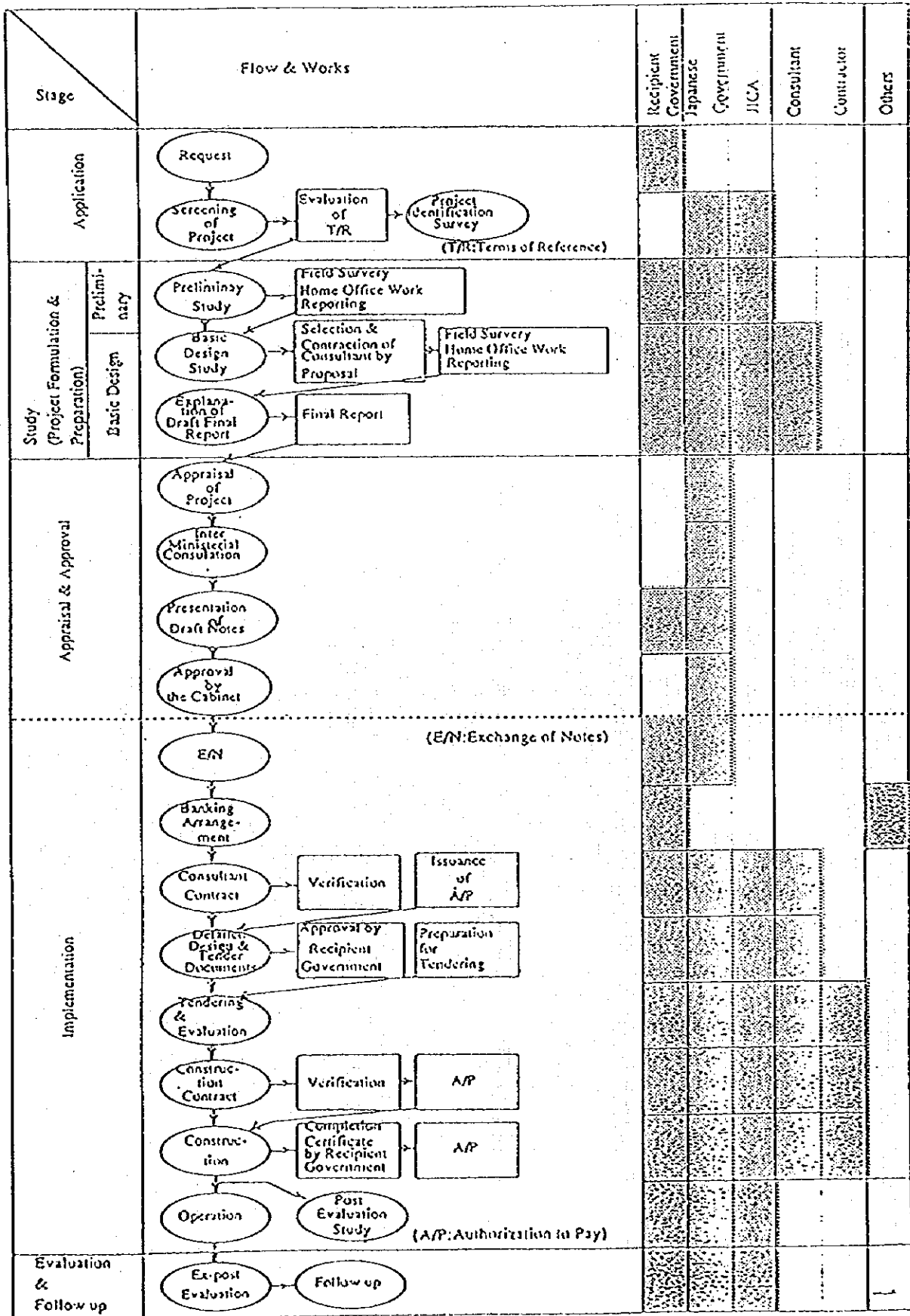
8) "Re-export"

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

**9) Banking Arrangements (B/A)**

- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

# Flow Chart of Japan's Grant Aid Procedures



*JICA*

Major Undertaking to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		•
2	To clear, level and reclaim the site when needed		•
3	To construct gates and fences in and around the site		•
4	To construct the parking lot	•	
5	To construct roads		
	1) Within the site	•	
	2) Outside the site		•
6	To construct the buildings	•	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distributing line to the site		•
	b. The drop wiring and internal wiring within the site	•	
	c. The main circuit breaker and transformer	•	
	2) Water Supply		
	a. The city water distribution main to the site		•
	b. The supply system within the site (receiving and elevated tanks)	•	
	3) Drainage		
	a. The city drainage main (for storm, sewer and others) to the site		•
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	•	
	4) Gas Supply		
	a. The city gas main to the site		•
	b. The gas supply system within the site	•	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		•
	b. The MDF and the extension after the frame/panel	•	
	6) Furniture and Equipment		
	a. General furniture		•
	b. Project equipment	•	
8	To bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the B/A		
	1) Advising commission of A/P		•
	2) Payment commission		•
9	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	•	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		•
	3) Internal transportation from the port of disembarkation to the project site		•
10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.		•
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.		•
12	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant.		•
13	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment.		•

## ANNEX-3

### NECESSARY MEASURES TO BE TAKEN BY THE GOVERNMENT OF INDONESIA IN CASE JAPAN'S GRANT AID IS EXTENDED.

1. To provide data and information necessary for the Project.
2. To bear two kinds of commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement (B/A) namely,
  - the advising commission of the "Authorization to Pay (A/P)" and
  - the payment commission.
3. To ensure prompt unloading, tax exemption, and customs clearance at the port of disembarkation in Indonesia and prompt internal transportation therein of the materials and equipment for the project purchased under the Grant Aid.
4. To exempt Japanese nationals or a staff from a third country engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Indonesia with respect to the supply of the products and services under the verified contracts.
5. To accord Japanese nationals or a staff from a third country whose services may be required in connection with supply of the products and services under the verified contracts, such facilities as may be necessary for their entry into Indonesia and stay therein for the performance of their work.
- 6 To provide necessary permissions, licenses, and other authorization for implementing the Project, if necessary.
7. To assign appropriate budget and staff members for proper and effective operation and maintenance of the equipment provided under the Project.
8. To maintain and use properly and effectively the equipment provided under the Project.
9. To bear all the expenses other than those to be borne by the Grant Aid within the scope of the Project.

